

**PROFESSIONAL HUMAN CAPITAL FLOWS:
TEMPORAL STRUCTURE OF LOSS, REPLACEMENT, AND CONTINGENT
BUNDLING EFFECTS ON FIRM PERFORMANCE**

A Dissertation

by

RHETT ANDREW BRYMER

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August 2012

Major Subject: Management

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Approved by:

Co-Chairs of Committee,	Michael Hitt David Sirmon
Committee Members,	Leonard Bierman R. Duane Ireland Hiroshi Ono Peter Sherer
Department Chair,	Ricky Griffin

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ABSTRACT

Professional Human Capital Flows:
Temporal Structure of Loss, Replacement and Contingent Bundling Effects on Firm
Performance.

(August 2012)

Rhett Andrew Brymer, B.A., Kenyon College; M.B.A., Florida State University;

M.S., Florida State University

Co-Chairs of Advisory Committee: Dr. Michael Hitt
Dr. David Sirmon

While resource based theory (RBT) addresses the importance of both possessing and orchestrating resources that have the potential of creating competitive advantage, it suggests little about the effects of unintentionally losing such resources. Further, RBT is silent about the manners in which firms replace after such losses by acquiring external resources. Attending to these gaps, this study considers the loss of professional human capital (PHC) in a panel data set of the largest U.S. based law firms, the contingencies of loss that effect subsequent firm performance, and the manner in which firms replace with new PHC. Results suggest that losing PHC with less firm specificity and PHC that has greater redundancy in geographic locations weakens the negative effects of loss. Additionally, organizational strain is theorized to cause replacement of PHC with external PHC hires similar to those already in the firm. Results show that this is the case for greater volumes of PHC loss and greater geographic diversification, but the opposite

is true of prior performance and the manager-subordinate ratio. Implications for RBT, the attraction-selection-attrition (ASA) model, and strategic human capital theory are discussed.

DEDICATION

To Mom and Dad, Becky and Bob Brymer.

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CHAPTER I

INTRODUCTION

Movement of valuable talent between organizations is common in developed economies (Cappelli, 2008; 2000). For example, in May of 2011, Rice University hired three of the world's most prominent theoretical biophysicists from University of California – San Diego, a strategic action which grants Rice new and unique capabilities in cancer research and likely harms UC-San Diego's similar capabilities (Keller, 2011; Ruth, 2011). Of particular importance to firms is the flow of professional human capital, i.e., the specialized knowledge and experience of professional employees, into and out of organizations because of its influence in creating and implementing effective strategies (Castanias & Helfat, 2001; 1991; Dess & Shaw, 2001; Lepak & Snell, 1999; Wooldridge & Floyd, 1990). Losing professional human capital (PHC, henceforth), which is differentiated from other forms of human capital because of its high knowledge intensity and lengthy and costly investment in development, can be particularly detrimental to the performance of firms as professional attrition can erode routines that support the focal firm's strategies (Aime, Johnson, Ridge, & Hill, 2010; Phillips, 2002; Wezel, Cattani, & Pennings, 2006). Interestingly, hiring professionals from rivals may also be damaging to the focal firm (e.g., Groysberg, Lee, & Nanda, 2008), as it has been argued that mobility allows the professional to appropriate more value than s/he brings to the new firm (Coff,

This dissertation follows the style of *Academy of Management Journal*.

2011; 1999). Despite the evidence that losing and gaining PHC can negatively affect firms, positive outcomes can also occur due to losses and gains of PHC (Aime et al., 2010; Rao & Drazin, 2002; Somaya, Williamson, & Lorinkova, 2008). Thus, despite being a critical resource for firms, there is a lack of understanding of how and when PHC flows matter – we do not understand very much about the circumstances under which its movement begets positive or negative firm performance, or how that performance is altered over time (Bridoux, Smith & Grimm, in press; Hancock, Allen, Bosco, McDaniel & Pierce, in press; Hausknecht & Trevor, 2011).

Resource-based theory (RBT) provides a framework within which to consider the equivocal performance effects of resource loss and gain, such as that of PHC. The flows of resources into and out of the firm dynamically reconstitute a firm's stock of resources (Dierickx & Cool, 1989). As PHC exits and enters a firm, the resource stocks under the firm's control are altered, which in turn changes the firm's competitiveness and its ability to generate rents (Amit & Schoemaker, 1993; Barney, 1991). Because the stocks of PHC are particularly important for the competitive positioning and rent generation of firms (Castanias & Helfat, 1991; 2001), scholars have argued that specialized human capital is a firm's most critical resource (Hitt, Bierman, Shimizu, & Kochhar 2001; Pfeffer, 1994; Wang & Barney, 2006). Managing the flows of PHC within organizations is, therefore, an important strategic consideration, one with potentially dramatic firm performance implications (Campbell, Ganco, Franco & Agarwal, 2011).

Concerning these flows, RBT scholars have long recognized that resources are not perfectly mobile between firms (Barney, 1991; Dierickx & Cool, 1989; Peteraf,

1993; Wernerfelt, 1984). It has been argued and that the value of a resource, particularly PHC, is partially dependent on other firm resources (Coff & Kryscynski, 2011; Maritan & Peteraf, 2011) and the manner in which it is bundled with those resources (Ployhart & Moliterno, 2011; Sirmon, Gove & Hitt, 2008). The flows of PHC will have different firm performance implications depending on both the nature of the resource and how the resources are bundled within the firm into/from which it is flowing.

Little empirical work, however, has explored the performance implications of flows given resources bundled heterogeneously across firms. How firms bundle their PHC is a principal strategic consideration (Sirmon et al., 2008), particularly for professional service firms (Pennings & Wezel, 2007). Firms bundle their PHC resources with considerations of co-location (i.e., geographical diversification), service diversification (i.e., product markets that the firm's professionals focus their energies), and with other support staff (e.g., leverage in law firms; Sherer, 1995). As such, the performance implications of PHC flows may depend on these understudied factors involved in bundling, which may be the reason behind the ambiguous findings of PHC flows' studies to date. This study will explore the characteristics of resource flows and the firm bundling context from/to which they are flowing, addressing a clear gap in our understanding about the circumstances under which resource flows affect performance.

Clearly, losing and gaining PHC changes the firm's resource portfolio. Studies to date have focused primarily on the total quantity of outflows (i.e., number of employees leaving), but there has been little work on the attributes of these outflows, how these

outflows are bundled (in the exited firm), nor how firms may recover from such resource loss. This paper will explore these contingencies of outflows on firm performance.

Further, studies have largely ignored inflows of PHC and how they might help firms recover from prior PHC loss. Recently, RBT scholars have sought to address organizational resource acquisition, arguing that existing resource stocks within firms can reduce the cost and likelihood of acquisition for complimentary external resources (Wernerfelt, 2011) and that these acquisition actions are path dependent for developing capabilities (Maritan & Peteraf, 2011). In building these capabilities, firms navigate external factor markets (Barney, 1986; Makadok & Barney, 2001) and acquire and configure their resources (Helfat, Finkelstein, Mitchell, Peteraf, Singh, Teece & Winter, 2007; Sirmon, Hitt & Ireland, 2007; Sirmon, Hitt, Ireland & Gilbert, 2011) to enact strategies and meet customer needs. These RBT arguments clearly point to replacement of PHC as an action with important strategic implications, which may mitigate the harm caused by previous PHC loss. While this RBT perspective suggests that the firm's endowment of resources will determine which PHC the firm will most likely acquire, there is little direct empirical evidence predicting this action. Further, while RBT recognizes some of the drivers behind acquisition actions, such as superior information (Barney, 1986; Makadok & Barney, 2001) and existing complementarities within the organization (Dierickx & Cool, 1989; Maritan & Peteraf, 2011; Wernerfelt, 2011), firms may also act with biases specific to structuring their PHC. These biases are not well understood within the RBT literature (Maritan & Peteraf, 2011).

A theory within the organizational staffing literature, however, directly addresses the drivers and biases of organizations' acquisition of PHC – specifically, the attraction-selection-attrition model (ASA model; Schneider, 1987; Schneider, Goldstein & Smith, 1995; Schneider, Smith, Taylor & Fleenor, 1998; Ployhart, Weekly & Baughman, 2006). The central proposition of the ASA model is that organizations attract and select external employees that are most similar to those already within the firm, while those already in the firm that are less similar will be more likely to attrite. These actions tend to be mutually voluntary and over time these actions create differentiated portfolios of PHC resources across firms (Schneider, 1987). Accumulated PHC that is homogeneous can create unique firm resource bundles and capabilities (Ployhart & Moliterno, 2011; Ployhart et al., 2006; Schneider et al., 1995) which can drive the actions and effectiveness of firms (Ployhart, Van Iddekinge, & MacKenzie, 2011).

Taken to a logical extreme, the ASA model would predict that variation between firms increases as variation within firms decreases. That is, firms become differentiated from each other with respect to its PHC as they become increasingly homogeneous in terms of PHC (Schneider et al., 1995). In such a scenario, as firms become increasingly homogeneous internally, they would cease acquiring any PHC that is not exceedingly similar to current firm stocks. We know, however, that there are instances when inflows of PHC are not exceedingly similar to current stocks. At times, firms choose to acquire PHC that is *not* similar to that already in the firm (Schneider et al., 1995), contrary to the ASA model's prediction. Corroborating the gap in RBV, there is virtually no theory or empirical evidence from the ASA perspective that points to conditions under which

firms choose to replace with more or less similar PHC, despite its implications for firm differentiation, competitive advantage, and temporal effects on firm performance. To better understand these important inflows, this paper will develop theory to address the conditions under which firms replace/acquire PHC resources that adhere to this “homosocial reproductive system” consistent with the ASA model (Kanter, 1977; Schneider et al., 1995) and those in which they do not.

Researchers examining the PHC flows - firm performance relationship have recognized the need for furthering our understanding of these flows, and have recently called for more nuanced explanations for the conditions under and temporal structure in which these flows affect firm outcomes (Hancock et al., in press; Holtom, Mitchell, Lee, & Eberly, 2008; Kacmar, Andrews, Van Rooy, Steilberg & Cerrone, 2006). The next section will outline the aspects of the flows and firm bundling characteristics that this research will address, and further define the research questions in this study.

Research Questions

Little is understood about the circumstances in which the flows of PHC affect firm performance and how firms acquire PHC after an outflow, despite the recognition that the management of these flows is of high strategic importance (e.g., Aime et al., 2010; Chadwick & Dabu, 2009; Pfeffer, 1994). Herein, I use a resource-based theory (RBT), ASA model, and human capital framework to explore dimensions of resource flows that may significantly and subsequently impact an organization's performance and structuring actions over time.

The most grounded of these dimensions in the management literature is the quantity of human capital outflow (i.e. level of turnover, or number of employees exiting the organization). Empirical studies have generally shown a negative relationship of human capital outflow with firm outcomes (Hancock et al., in press).

While many researchers have considered the quantity of human capital outflow-firm performance relationship, few have studied the implications of flows of more nuanced dimensions of human capital (Ployhart et al., 2006), especially when considering professionals specifically. This is problematic because of the unique roles played by professionals serving as knowledge intensive information conduits, orchestrating resources, and making autonomous decisions (Wooldridge & Floyd, 1990; von Nordenflycht, 2010), which could have unique implications as they leave and enter firms. To address the complexities associated with the PHC flows specifically, resource-based theory and the ASA model suggest two other dimensions that may be of particular interest when considering PHC flows – the quality of human capital and the similarity of those PHC resources to the focal firm. The quality of human capital is defined as the endowment of general and firm-specific knowledge and experience. Higher quality PHC is able to perform more efficiently, make better decisions, and more effectively handle executive demands (Castanias & Helfat, 2001) and thereby contribute to the creation of competitive advantage (Wang & Barney, 2006). Likewise, the similarity of PHC within organizations constitutes a portion of its differentiation among competitors, and thus the similarity of flows of PHC plays an important role in the maintenance of competitive advantage.

Additionally, the bundling of the focal firm PHC resources is posited to affect the impact of the outflows of PHC on firm performance. Firm-wide bundling of its human capital resources provides a context within which PHC can emerge as a valuable firm resource (Ployhart & Moliterno, 2011) to potentially create competitive advantage (Barney & Wright, 1997). Two types of bundling are examined in this study, firm leverage and geographic diversification, as they each have clear implications in affecting the knowledge remaining in the firm after the loss. Not to be confused with the leveraging (i.e., deploying) as a resource orchestration activity, in the context of professional service firms leverage refers to the number of subordinates per manager. Leverage as a type of bundling has been examined before in conjunction with stock human capital studies (e.g., Hitt et al., 2001; Sherer, 1995), and different leverage amounts are theorized here to affect performance as PHC exits. Similarly, geographic diversification is a bundling dimension that determines the extent to which PHC is co-located throughout a firm. Geographic diversification is theorized to have firm performance implications on the remaining stocks of PHC when there is outflow.

The similarity of PHC resource flows to the stocks of PHC resources in an acquiring firm has been argued to be a key dimension for future performance, as economies of scale and scope may emerge with similar resource inflows (Hitt, Harrison, & Ireland, 2001; Wernerfelt, 2011). Little research has been conducted that examines how firms structure their resource portfolios with acquisition of similar PHC resources following outflows, however (Schneider et al., 1995). As such, the same conditions that affect firm performance are also argued to simultaneously affect the firm's acquisition

behavior. This study examines the conditions – namely, quality and similarity of PHC outflows and the focal firm's bundling – under which professionals are more or less likely to replace outflows of PHC with that more similar to stocks already in the organization.

Finally, this study examines the temporal structure of the flows of PHC. The impacts of PHC flows over time are not well understood (Hancock et al., in press), which is particularly problematic as firms can subsequently replace their PHC in various manners after loss. This study will conclude by examining the effect of outflows on performance over time, along with the ameliorating effects of acquiring more similar PHC to reduce any harm in performance.

To summarize, in this dissertation, I address three broad research questions. First, under what conditions are PHC outflows most detrimental to firm performance? Second, following PHC outflows, when do firms seek to replace the outflowing PHC with similar (or not) PHC? Finally, how does the firm perform over time after a PHC loss and subsequent replacement of more (or less) similar PHC resources? In answering these questions, characteristics of exiting and replacement professionals and their bundling within their focal firm provide a more enriched understanding of the resource flows-firm performance relationship.

Contributions

There are three important contributions from this study. First, this work will extend human capital theory, RBT, and the ASA literatures by adding contingencies

(quality of flows, similarity of stocks and flows, and types of bundling) for determining the performance of firms given outflows of resources, specifically PHC. Understanding these contingencies will enlighten what is now a phenomenon with unexplored complexities. These findings have implications for the way PHC can be assessed across firms and how PHC flows may be more or less valuable, depending on the context.

Second, this study will add to the emerging literature on resource orchestration (Sirmon et al., 2011; 2007) and the ASA model (Schneider et al., 1995) by describing the drivers behind the search and selection of PHC, and the contingencies under which firms realize value when reacting to PHC flows. This knowledge will improve our understanding of resource acquisition and the drivers behind it when faced with replacing lost resources.

Finally, this study adds to the literature on human capital turnover by addressing both the temporal effects of turnover and the ways in which firms react to various types of turnover in order to diminish potentially deleterious effects. The loss of PHC is a disruptive event that leaders within the firm typically address with the acquisition and re-bundling of new professionals. Describing the impact of PHC replacement and the firms' prejudice to create homogeneity (or heterogeneity) in hiring decisions will provide a more nuanced theoretical lens to explain how human capital flows lead to firm PHC acquisition activities in a dynamic environment and how they subsequently affect firm performance.

Organization of Dissertation

The organization of this dissertation is as follows. Next is a literature review (Chapter II), where pertinent previous work is reviewed in the areas of resource based theory and resource orchestration, human capital and PHC, the ASA model, and the turnover-firm performance relationship. After this basis is covered, I turn to new theory development and hypotheses (Chapter III), which will describe the developed model of PHC flows' quantity, quality, and similarity, within the contexts of firm bundling types to determine both replacement strategies and performance implications. The methodology for testing this new theory is covered in the following chapter (IV), where the sample of law firms, the investigated variables, and the analysis procedures are explained. Results of the study are then outlined in Chapter V. Finally, the dissertation concludes with a discussion of the implications of the study for theory, empirics, and management practice in Chapter VI.

CHAPTER II

LITERATURE REVIEW

The topic of this dissertation focuses on the flows of a specific firm resource - PHC - and the temporal performance implications of such movement. As such, this chapter is partitioned into sections of literature streams that used to frame the development of subsequent hypotheses in Chapter III. First, the theoretical framework on which this study is primarily based is the resource-based theory of the firm (Barney, 1991; Dierickx & Cool, 1989; Penrose, 1959; Wernerfelt, 1984). Secondly, this analysis of the literature considers the findings dealing with PHC within individual organizations and its unique considerations as a firm resource as a basis for understanding it (Coff & Kryczenski, 2011; Coff, 1999; 1997; Hitt et al., 2001; Sherer, 2011; Wang & Barney, 2006). Finally, this review explores the ASA model of intra-firm homogeneity and flows (Ployhart et al., 2006; Schneider, 1987), the emergent literature on resource orchestration (Helfat, et al. 2007; Sirmon, et al. 2011; 2007) which is particularly applicable given the dynamic nature of PHC inflows and outflows, and the phenomenological literature base of the performance implications of interfirm professional mobility and turnover (e.g., Aime et al., 2010; Hancock et al., in press; Siebert & Zubanov, 2009).

As this chapter's organization goes from a more general theory of RBT to more phenomenological focused literatures considering the PHC flows - firm performance relationship, the focus of this chapter's discussion parallels the review. It begins with a

more general discussion of resources to a general discussion of human capital to a focus on mobility and turnover. . The review covers RBT, human capital, ASA, and employee turnover-firm performance relationships in a more general fashion, as there is relatively little empirical work that considers PHC flows directly. The literature streams covered, while discussed more generally, are reviewed because they each have implications for PHC flows. PHC, therefore, can be semantically substituted for generic resources and generic human capital in this chapter. Any discussion of generic resources, generic human capital, and generic employees accurately reflects the nature of the literature reviewed, all of which has implications for our understanding of PHC and professionals more specifically.

Resource Based Theory and Resource Orchestration

The resource based theory of the firm draws as a basic observation that firms are heterogeneous, and that such heterogeneity is persistent for firm outcomes and performance (Barney, 2005). Contrary to more externally focused paradigms of firm performance explanations (e.g., the industrial/organizational model; Porter 1985; 1980), RBT maintains that firms have internal idiosyncrasies that confer competitive advantage (Conner, 1991; Wernerfelt, 1984), and thus the potential to realize organizational rents, i.e. profitability that exceeds that of its competitors in the same industry (Amit & Schoemaker, 1993; Porter, 1985; Ricardo, 1817). Specifically, firms are composed of sets of resources (Penrose, 1959), defined herein as inputs to a production process that

are in control (or partial control) of the management of the firm that can be employed for economic benefits (Hitt, Ireland, & Hoskisson, 2009; Helfat & Peteraf, 2003).

Firm resources are typically broadly defined as all “assets, capabilities, organizational processes, firm attributes, information, [and] knowledge” on which the firm can draw to conceive and enact strategies (Barney, 1991). Based on this definition, all organizations possess resources, *prima facie*. Achieving competitive advantage with firm-specific resources is based on the necessary condition of those resources being rare and valuable; and, this advantage can be sustained if those resources are inimitable and non-substitutable (Barney, 1991; Hoopes, Madsen, & Walker, 2003; Peteraf, 1993).

RBT scholars have theorized that typically these resources are socially complex (Barney, 1991) and embedded in or bundled with the human capital of the organization (Barney & Wright, 1997; Hitt, et al., 2001; Pfeffer, 1994; Wright & McMahan, 1992).

The idea of the central role of employees, and especially managers and other professionals that have control over resources, as integral actors in the bundling of firm resources is consistent with the seminal work of Penrose (1959). Often credited as the primary base of the RBT, Penrose's early work (1959) described the growth of firms as a function of both the resources under control of the firm and the managerial ability to “service” those resources, i.e. the administrative framework and subsequent decision making that coordinates and connects the productive resources of the firm into products valued in the market. Without an effective organizational framework and professional staff to service the resources, a firm is likely to remain stagnant, fail to grow, and be at a disadvantage relative to its competitors (Penrose, 1959).

When RBT emerged as a dominant paradigm for strategic management in the 1990s (Hoskisson, Hitt, Wan & Yiu, 1999), the role of managerial volition and organizational capabilities that it confers in creating firm value had an unspecified role within the RBT framework (Priem & Butler, 2001). The focus of RBT was on possessing or accessing the VRIN resources (Barney, 1991) through strategic factor markets (Adegbesan, 2009; Barney, 1986; Capron & Chatain, 2008; Markman, Giandionis, & Buckholtz, 2009) or accumulating over years, using competitive diseconomies to the firm's advantage (Dierickx & Cool, 1989). RBT was criticized initially as being tautological, lacking contextual theory on when resources became valuable, and for not addressing managerial actions (such as bundling and deploying) that are necessary to capture value from the resources possessed (Porter, 1991; Priem & Butler, 2001). Simple possession of or access to VRIN resources is not sufficient to realize superior performance (Barney & Arkan, 2001; Priem & Butler, 2001), and early conceptions of RBT did not address this criticism directly.

Two notable theoretical frameworks also emerged in the 1990s that ameliorate these shortcomings of RBT to a degree: knowledge based view and dynamic capabilities perspective. Although at the time they were considered tangential to RBT, these two theoretical traditions have informed the development of RBT and are closely related paradigmatically (Acedo, Barroso, & Galan, 2006; Ramos-Rodriguez & Ruiz-Navarro, 2004). The knowledge based view of the firm (Kogut & Zander, 1992; 1993; Grant, 1996; Spender & Grant, 1996; Tsoukas, 1996) views the firm as a knowledge repository and the capabilities of firms to exchange knowledge efficiently as a defining mechanism

of the firm boundaries. Implicit in this view is knowledge as a resource (Barney, 1991) that is critical in firms gaining competitive advantage (Argote & Ingram, 2000; Berman, Down, & Hill, 2002; Grant, 1996; Nonaka & Takeuchi, 1995). As a vast amount of organizational knowledge is embedded within the firm's employees (Tsoukas, 1996), the knowledge based view undergirds the RBT by inferring an emphasized role of the professionals and their knowledge of how to realize and capture value (Lepak, Smith, & Taylor, 2007) from their resources.

Alternatively, the dynamic capabilities perspective specifically addressed how firms thrive in uncertain and rapidly evolving environments by constantly altering their capabilities to both recognize external change and modify internal processes to keep pace with it (Teece, Pisano, & Shuen, 1997). Dynamic capabilities can be thought of in the context of RBT (Helfat & Peteraf, 2003; Makadok, 2001), as they are “higher order” capabilities that firms develop to constantly re-bundle firm resources (and, thus, change capabilities) which allow the firms to achieve a particular goal (Hitt et al., 2009; Sirmon et al., 2007). The behavioral implications of dynamic capabilities, i.e. the requirement of the organization to re-bundle and deploy resources iteratively, again implicitly identify professionals and their own actions as a focal point of value creation.

Quality, Similarity, and Quantity of PHC Resource Flows

The focus of this paper is on the flows of professional human capital, which is a critical and mobile firm resource. To better understand these PHC flows, three dimensions are considered – quality, similarity, and quantity. Each of these dimensions

harkens a literature stream that supports their importance when considering PHC movement. Quality of PHC is based on previous work on human capital as a resource, and the quality of PHC can be thought of as the caliber of general, industry, and firm-specific knowledge and skills possessed by a firm's professionals. The similarity of PHC is best addressed by the ASA model and the RBT notions of resource similarity prominent in acquisition research. The quantity of PHC flows is addressed primarily by the theoretically eclectic stream of employee mobility and turnover-firm performance research. By considering these different dimensions of PHC flows, we should have a more nuanced understanding of its impact to firms. With this framework of the dimensions of PHC, the rest of this literature review will consider these dimensions in the context of their supporting research streams.

Quality of Professional Human Capital as a Consequential Firm Resource

Economists have long recognized the value of human capital as a productive resource. As far back as *The Wealth of Nations*, Adam Smith observed that, “The improved dexterity of a workman may be considered in the same light as a machine or instrument of trade which facilitates and abridges labor, and which, though it costs a certain expense, repays that expense with a profit” (1776: 377). Credited first with the term “human capital,” Pigou (1920) noted that investments are made to human capital, such as time and money spent acquiring skills, just as they are in other types of capital, such as mechanical capital. In the 1950s and 1960s, the study of human capital gained foothold in the mainstream academe of economics with the contributions of Schultz

(1961), Mincer (1958), and Becker (1964, 1962). These economists made a number of contributions including describing wage differentials in labor markets based on human capital heterogeneity (Mincer, 1958), explaining economic success of regions based on their relative endowments of human capital (Schultz, 1961), and describing the complex investment decisions surrounding human capital faced by firms (Becker, 1964; 1962).

Human capital is defined as the aggregate skills, knowledge, and abilities held by an individual or collectivity (team, organization, geographic region) of individuals that can be used to achieve economic productivity (Becker, 1964; 1962; Castanias & Helfat, 2001; Ployhart & Moliterno, 2011). These human capital attributes of employees (professionals) constitute bundles of resources nested within individuals (Foss & Foss, 2005), unit-level aggregations such as teams, divisions, organizations (Barney, Ketchen & Wright, 2011; Coff & Kryscynski, 2011; Felin & Hesterly, 2007; Klein & Kozlowski, 2000; Molloy, Ployhart & Wright, 2011; Ployhart & Moliterno, 2011), and collective aggregations such as industries, cities, regions, and countries (Becker, 1964; Florida, 2002; Schultz, 1961). It has been argued that it is important to consider human capital at the individual level, as each individual is an agent, and thus capable of choosing the degree to which his or her knowledge and effort is deployed for any given task or purpose (Spender, 2011). Indeed, much of the fundamental theorizing on human capital considers the incentives for action faced by individual employees (professionals) and how these incentives and subsequent choices affect the way firms should manage their human capital for profit-maximizing purposes (e.g., Becker, 1962; Wang & Barney, 2006; Wang, He & Mahoney, 2009). The primary level of concern for this paper is the

organization-level – how individual actions aggregate to firm-level human capital resource flows, how organizations react to those flows, and how firms perform due to those flows. Application of human capital theory to the organization-level, specifically, is a nascent area for research, one that is likely to produce greater insights in firm strategy, survival, and performance (Ployhart & Moliterno, 2011; Sherer, 2011; cf. Hitt, Beamish, Jackson, & Mathieu, 2007).

Scholars have argued that the quality of human capital is firms' most important resource influencing firm performance (e.g., Barney & Wright, 1997; Chadwick & Dabu, 2009; Hitt et al., 2001; Pfeffer, 1994; Wright, Smart & McMahan, 1995).

Management scholars have offered three primary perspectives on why human capital is a resource that is more likely to create competitive advantage and resultant rents, i.e., profits above the expected return. First, Barney and colleagues (1991; Barney & Wright, 1997; Barney, Wright & Ketchen, 2001, Wang & Barney, 2006) asserted that social relationships between employees and the causal ambiguity of interdependent organizational tasks are often unobservable and complex. As other firms cannot observe the complex social relationships of their competitors, and these relationships are in place to facilitate knowledge resource sharing (or bundling) among a distributed group (Argote & Ingram, 2000; Hayek, 1945; Kogut & Zander, 1992; 1993; Tsoukas, 1996), it is very costly, if not impossible, for competitors to imitate the social relationship bundles of resources of a rival firm. Of course, this circumstance is made more difficult for competitors as the complexity of the human capital bundles increases, as is the case

when firms are large and/or have intricate organizational structures (Colbert, 2004; Hitt et al., 2009).

Secondly, the strategy of a firm is formulated by and the implementation of the strategy is overseen by the top management team (TMT), a very specific type of professional. Strategic positioning (Porter, 1980; 1985; 1991) and the orchestration of resources within the firm to align with the environment and create value (Amit & Schoemaker, 1993; Sirmon et al., 2011) are the primary responsibility of the TMT (Hambrick & Mason, 1984). Because their skills and knowledge of formulating and implementing strategies directly affects the ability of firms to earn profits, the human capital of the TMT is considered a firm resource with significant performance implications (Castanias & Helfat, 2001; 1991; Finkelstein, Hambrick & Canella, 2009).

The third major argument for the importance of human capital as a firm resource is due to the unique nature of human capital in forming organizational capabilities (Kor & Leblecici, 2005; Lewin, 2011; Sherer, Rogovsky & Wright, 1998). This argument centers around two primary points – the subjectivity of individuals in creating uses for resources and the actions of orchestrating resources based on their uses. Professionals have unique cognitions, with particular human capital bundles of creativity, intelligence, knowledge, experience, and skills (Brymer et al., 2011; Schultz, 1975). As such, there is heterogeneity in the perspectives of professionals with respect to how certain resources can be best used (Foss, Klein, Kor & Mahoney, 2008). The subjectivity of individuals, and in particular their knowledge of how to create value from firm controlled resources, results in markets with imperfections and large variations in the value and utility of those

resources (Kirzner, 1974; Kraaijenbrick, 2011; Kraaijenbrick, Spender & Groen, 2010). This phenomenon is perhaps best described in the entrepreneurship literature, as entrepreneurs can overcome resource poverty by creating “something from nothing” through bricolage (Baker & Nelson, 2005). Additionally, entrepreneurial professionals may effectuate by allowing an unfolding of decisions about the nature of resource use in spontaneous ways to create value (Sarasvathy, 2001). These perspectives underline the ability of superior PHC as leverage in otherwise resource mundane or resource poor environments to create above average firm performance outcomes.

Related to the cognitive subjectivity of use are the actions undertaken to manage the “vast reservoirs of scarce...and unpriced resources” of the firm (Lippman & Rumelt, 2003a: 1069). Specifically, these are actions that are enabled by the PHC of the firm – the actions of orchestrating firm resources (Helfat et al., 2007; Sirmon et al., 2007; 2011). These resource orchestration actions are performed by individual professionals (or bundles of professionals) within the firm. These actions are differentiated from the conceptual notion of resources, as managerial actions can unlock resources (i.e. by servicing resources or via resource use) but are not resources themselves (Coff & Kryscynski, 2011; Penrose, 1959). The empirical record of the performance implications of resource orchestration has demonstrated its role in organizational performance. For example, Adner and Helfat (2003) showed that a portion of the variance of organizational profitability is due to differences in managerial capabilities. Researchers have also shown resource management processes to play significant roles in competitive matchups (Holcomb, Holmes, & Connelly, 2009; Sirmon et al., 2008) and in profitability

across diffuse industries (Kor & Mahoney, 2005; Ndofor, Sirmon, & He, 2011; Sirmon & Hitt, 2009).

Quality of Professional Human Capital and Competitive Advantage – Prospects and Issues

In Becker's groundbreaking works (1964; 1962), human capital is separated into two major types: general and firm-specific. The distinction between general and firm-specific human capital pivots on the applicability of the human capital to various other firms. General human capital is widely applicable skills, knowledge, and abilities in which any firm may find roughly equivalent value. Examples of general human capital include general mental ability, conscientiousness, and basic skills such as reading, writing, or speaking (Ployhart & Moliterno, 2011). Firm-specific human capital, by contrast, involves skills, knowledge and abilities that are not applicable outside the focal firm (Becker, 1964; Hatch & Dyer, 2004; Wang & Barney, 2006). Examples of this include knowledge of proprietary firm systems, skills in navigating organization-specific politics, and abilities to perform tasks only executed (or valued) at that particular firm. General human capital, because of its transferability and relative ease of evaluating, is more likely to be priced according to the market value of that labor (Becker, 1964). Firms developing general human capital create opportunities for employees to switch organizations, as this value is widely sought in the labor market (Markman et al., 2009).

While investments in general human capital are likely to produce greater returns for the employee than the firm, firm-specific human capital investments are expected to

have more importance for firm efficiency (Becker, 1964; 1962; Williamson, 1975) and for the realization of competitive advantage (Barney & Wright, 1997; Castanias & Helfat, 2001; Hatch & Dyer, 2004; Ployhart et al., 2011; Sherer, 2011; Wang & Barney, 2006; Wang et al., 2009). Firm-specific human capital is the basis of routines, capabilities, and knowledge that differentiates the firm from competitors. Greater amounts of firm-specific human capital are an isolating mechanism, as competitors would find higher asset specificity in the form of unique firm knowledge, routines, and capabilities more difficult to imitate (Wang & Barney, 2006). Efficiencies realized in the reduction of transaction costs (Williamson, 1975) and ease of knowledge transfer (Kogut & Zander, 1992) that accompany firm-specific human capital represent value to the firm. Greater specificity and co-specialization of human capital with other assets begets rarer bundles. Further, firm-specific human capital becomes situated in the context of organizational administrative and support processes, allowing the creation of value from both human capital resources and resources bundled with them (Barney & Wright, 1997; Coff & Kryscynski, 2011; Kor & Leblebici, 2005; Penrose, 1959). Finally, firms are likely to capture more value from firm-specific human capital because employees are less likely to appropriate value (i.e., demand higher wages) with diminished bargaining power in the external market (Becker, 1964; Coff, 1999; Wang & Barney, 2006). Firm specific human capital raises the productivity of the focal firm, but such productivity is not mobile across firms. As firm specific human capital investments are made, and those returns are valuable only to the focal firm, general human capital investments are foregone. Because general human capital is valued in the external market, and firm

specific human capital is not, firms are able to appropriate rents from employees with greater endowments of firm specific vs. general human capital, as competing firms are likely to have greater discrepancies of the pricing for those human capital resources (Becker, 1964).

Though these arguments are consistent with the RBT's assertion that human assets are among the most valuable, rare, and difficult to imitate because of their social complexity and causal ambiguity (Barney, 1991; 1986), a number of scholars have also suggested that human capital is a unique resource that is fraught with hazards that are poorly addressed with RBT's homogenous treatment of resource types (Coff, 1997; 1999; 2010; 2011; Coff & Kryscynski, 2011; Foss & Foss, 2005; Kraaijenbrick, Spender & Groen, 2010; Kraaijenbrick, 2011; Lippman & Rumelt, 2003b). These criticisms of the treatment of human capital within RBT fall into three major categories: the appropriation of rents, ambiguity of human capital value and control, and the lack of emergence mechanisms that describe the link from human capital to competitive advantage.

The appropriation of rents refers to the way in which additional profits (i.e., those in excess of expected profits) are divided among stakeholders of a firm. In a typical, publically traded company, owners (stockholders) of the firm are commonly dispersed (Berle & Means, 1932; c.f. Dalton, Hitt, Certo, & Dalton, 2008). The ability of any one owner/stockholder to gain information is usually limited to the amount that is released to the broader market. Manager of the firm are in a better bargaining position to appropriate firm rents for a number of reasons (Coff, 1999). First, employees are in a better position

to access and control information than are shareholders (Alchian & Demetsz, 1972; Coff, 2000; 1999; 1997). This asymmetric information position held by employees can be exploited for demanding higher wages and higher portions of rents. Thus, if a competitive advantage is held by a firm, but the employees appropriate any rents generated by the competitive advantage due to superior information, the firm will not create above average returns for the shareholder. The bargaining position of employees is further strengthened by high replacement costs of firm specific human capital (Coff, 1999; Hatch & Dyer, 2004) and the ability to act in greater unison (with tactics such as union membership and collective bargaining) vis-à-vis shareholders (Coff 1999). It should be noted that this agency limitation is largely nullified with professional service firms, such as law firms or accounting firms, as a portion of their professionals are managers who also have an ownership stake, i.e. partners or members (Pennings & Wezel, 2007).

The second issue with human capital as a resource lies in control and valuation difficulties. Firm specific human capital is not only difficult to replace, it is also only in partial control by the firm. Individuals are in ultimate control of how much effort to put forth for any task (Klein, Crawford & Alchian, 1978), which knowledge and skills to apply to those tasks or to specific resources (Foss et al., 2008), and when to decide to depart the organization (i.e., professionals in modern economies have employment at will; Coff, 1997). Additionally, human capital, which is controlled primarily by professionals in most firms, is notoriously difficult to assess. Knowledge-based assets are intangible and often unobservable, rendering their value challenging to evaluate

(Barney, Ketchen & Wright, 2011; Bassi, Lev, Low, McMurrer & Siesfeld, 2000; Blair, 2011; Lev, 2004; Molloy, Chadwick, Ployhart & Golden, 2011). Thus, while the difficulties of observing and mimicking the value of human capital can be a source of competitive advantage (Barney, 1991), these same characteristics also create unique challenges for the management of human capital for the focal firm (Coff, 1997).

The initial conceptions of RBT focused primarily on the generation of Ricardian rents (Wernerfelt, 1984; Barney, 1986), i.e., rents conferred to an organization because of a superior quality of resources and isolating mechanisms on which to obtain similar, fixed-supply resources by competitors. However, ways of generating rent are not exclusively Ricardian in nature; they can include Schumpeterian (i.e., entrepreneurial), non-traditional Ricardian rents (Chadwick & Dabu, 2009), Penrosian rents (Foss, et al. 2008; Penrose, 1959; Spender, 1994), information asymmetry rents (Makadok & Barney, 2001; Makadok, 2011; Miller, 2003), non-rivalrous rents (Kraaijenbrick, et al, 2010; Makadok, 2011) and commitment timing rents (Gimeno, Hoskisson, Beal, & Wan, 2005; Makadok, 2011; Suarez & Lanzolla, 2007). Each type of rent creation goes beyond the conception of traditional Ricardian rents. The commonality among all of these types that separate them from Ricardian rents is the integral role PHC plays in generating them. Specifically, each of these rent types are differentiated from Ricardian rents because of either 1) the unique resource attributes of knowledge, creativity, and subjectivity housed within the firm's stocks of human capital, (Brymer, et al., 2011; Chadwick & Dabu, 2009; Coff, 2011; Kraaijenbrick, 2011; Kraaijenbrick et al., 2010; Molloy, et al., 2011; Spender, 2011), and/or 2) the managerial behaviors and the timing

of those behaviors with respect to orchestrating or using resources (Coff & Kryscynski, 2011; Chadwick & Dabu, 2009; Holcomb, et al., 2009; Kraaijenbrick et al., 2011; Sirmon, et al., 2007; 2008; 2011). With the complexity and richness in the many various ways that PHC can create rents (Makadok, 2011) and only one measure (i.e., profitability) in which all rents are aggregated, it is difficult to identify the specific source of the rents created .

Because of these challenges, it has been argued that accounting and measurement of human capital value are extremely underdeveloped as internal control systems (Bassi et al., 2000; Lev, 2004). As Blair (2011: 65) states, “our measures or indicators of human capital are woefully inadequate.” Valuation of human capital in the external market, i.e. strategic factor market for labor (Markman et al., 2008; Barney, 1986) is fraught with uncertainty of quality and value (Akerloff, 1970; Alchian, 1969; Kraaijenbrick et al., 2010). With this uncertainty, labor markets rely on signals of quality to approximate the value to any firm (Spence, 1973), such as the quality of educational institution one attends (Ho, 2009; Ono, 2004; Useem, 1979; Useem & Karabel, 1986). Market signals of quality, however, are incomplete and can be misleading (Weiss, 1996); especially considering that even in the extreme case of perfect information about an individual in the external market is not necessarily indicative of the value that the individual contributes as a part of an interdependent bundle with other human capital resources in a new firm (Dierickx & Cool, 1989; Ployhart, 2004; Ployhart & Molierno, 2011; Ployhart et al., 2011). It has been suggested that the value of any human capital resource should be defined as the benefit that the resource provides the firm (usually an

amount that can only be roughly estimated using a variety of individual performance indicators) minus the wage cost (Sturman, Trevor, Boudreau, & Gerhart, 2003).

The third and final criticism of the treatment of human capital as a firm resource is the lack of emergent mechanisms that explain organization performance as a result of varying degrees of human capital. Though mechanisms of resource emergence are generally needed to more fully explain RBT (Barney et al., 2011; Lippman & Rumelt, 2003a), human capital resources are again particularly problematic. Micro-based organizational scholars commonly make the assumption that greater individual level human capital and resultant individual work performance lead to improved organizational performance (Ployhart, 2004). However, this has been questioned as a potential fallacy of emergence (Molloy, Ployhart & Wright, 2010; Ployhart, 2004). Many aspects of human capital are intangible and unobservable. Scholars have also questioned the degree to which individually held knowledge can be aggregated to the firm level, or that measures of firm level knowledge reflect true variation in individual human capital (Felin & Hesterly, 2007). The juxtaposition of human capital treatment as a resource at the collective-(or organization, or unit) level in the economics tradition and human capital as an individual-level construct in the psychological paradigm of organizational behavior also causes complications of a multilevel and multi-paradigmatic nature (Molloy et al., 2011; 2011).

Given the potential importance of human capital as a firm resource, several calls have been made to more explicitly describe the reasons why human capital may lead to competitive advantage, and how individual level human capital emerges within firms to

create firm level heterogeneity (Becker & Huselid, 2006; Becker, Huselid & Beatty, 2009; Coff & Kryscynski, 2011; Hitt et al., 2007; Huselid & Becker, 2011; Molloy, et al., 2010; 2011; Ployhart, 2004; forthcoming; Wright & Boswell, 2002). The prevailing wisdom is that human capital's value to the organization is largely a function of the quality and uniqueness of the firm's managers (Castanias & Helfat, 2001; 1991; Finkelstein et al., 2009) and other core professional employees within the organization (Lepak & Snell, 2002; 1999), coupled with various organizational attributes (Barney & Wright, 1997; Bowen & Ostroff, 2004; Coff & Kryscynski, 2011; Lewin, 2011; Ployhart & Moliterno, 2011). These attributes include governance systems (Wang & Barney, 2006; Wang et al., 2009), HR system configurations (Becker & Huselid, 2006; Chadwick & Dabu, 2009; Chadwick & Cappelli, 1999; Delery, 1998; Delery & Shaw, 2001; Huselid, 1995; Lepak & Snell, 2002; 1999; Lepak, Takeuchi & Swart, 2011), other VRIN resources (Colbert, 2004; Kor & Leblebici, 2005), interconnected human capital (Ployhart et al., 2011), firm strategy (Carpenter, 2002), a commitment to enrich current stocks of human capital through training and development (Hatch & Dyer, 2004), and inducement to continue making firm specific investments (Wang & Barney, 2006) through continued practice of skills and knowledge (Brymer et al., 2011; Ericsson, Prietula, & Cokely, 2007; Orlikowski, 2002). However, we only have a coarse understanding of the exact mechanisms by which human capital emerges as a productive organizational resource (Blair, 2011; Ployhart, 2004). Ployhart and colleagues (Ployhart et al., 2011; 2009; Ployhart & Moliterno, 2011) advanced this understanding by underlining the importance of human capital resource flows. They suggest that

organizational performance is an ongoing function of human capital emergence that relies specifically on the manner in which the organization manages the flows of human capital and how that human capital is continuously (re)bundled as dynamic stocks.

Emergence of human capital can be thought of, at least in part, as the realization of the value that those resources possess. The burgeoning research stream of resource orchestration addresses the centrality of the management actions to those resources in the realization of that value (Bridoux et al., in press; Sirmon, et al. 2011). Resource orchestration logic is similar to Penrose's concept of servicing resources, as well as the more recent focus of the particular ways professionals use resources, such as using their own subjectivity to derive unique value from resources (Foss et al., 2008), using a multi-paradigmatic lens with which to assess intangible resources (Molloy, Chadwick, Ployhart & Golden, 2011) such as professional human capital, and creating “something from nothing” by recombining and deploying otherwise ordinary resources in innovative ways (i.e. bricolage; Baker & Nelson, 2005). Resource orchestration more explicitly defines the roles and behaviors of professionals in conceiving the ways to use firm resources and their effectiveness in configuring and deploying them. The two consolidated articulations that comprise resource orchestration are asset orchestration (Helfat, et al., 2007) and resource management (Sirmon et al., 2007). Asset orchestration emphasizes two basic managerial processes of search/selection, which involves scanning the environment and choosing which resources will become a part of the firm, and configuration/deployment of those resources in contexts in which they will create value (Helfat et al., 2007). Similarly, Sirmon and colleagues (2007) outlined the three basic

processes of structuring, bundling, and leveraging resources. Structuring processes determine what resources are and are not under the firm's control – the primary original basis of how firms can build a sustainable competitive advantage (Barney, 1986; 1991). Bundling refers to the ways in which firms combine resources that create, sustain, or alter capabilities. Leveraging involves processes that connect the firm capabilities to external market opportunities (Sirmon et al., 2007). Though semantically unique, the resource management and asset orchestration perspectives share much in common, as they both address the manner in which professionals can utilize resources for competitive advantage (Sirmon et al., 2011).

Various empirical tests of resource orchestration dimensions have been supportive of these processes integral role in firm performance, including: how bundling of human capital diverse in experience improves firm performance (Hitt et al., 2001; Kor & Leblebici, 2005); how resource deployments affect profitability (Kor & Mahoney, 2005); how bundling and deployment actions of flexible resources creates advantages over rivals (Sirmon, Gove, & Hitt, 2008); how resource leveraging mediates the competitive action-performance relationship (Ndofor, Sirmon, & He, 2011); how resource deployment is contingent upon resource investment levels to achieve superior performance (Sirmon & Hitt, 2009); how firms can recover from failure to meet expected performance by acquiring new resources or bundle resources in novel ways (Morrow, Sirmon, Hitt, & Holcomb, 2007); how the quality of managerial ability, quality of resources, and coordination of capabilities affect competitive outcomes (Holcomb, Holmes, & Connelly, 2009); how weaknesses need to be orchestrated

(Sirmon, Hitt, Arregele, & Campbell, 2010); and that managerial effects embedded in a stable industry explain a significant portion of firm heterogeneity (Adner & Helfat, 2003). In total, the advances of resource orchestration as a way of understanding how professional human capital resources create value have enriched our understanding of the importance of professional skills, knowledge, and actions.

Similarity of Human Capital Flows – the ASA Model

The attraction-selection-attrition (ASA) model is a framework for understanding the flows of various human capital attributes into and out of an organization. The premise of the model is three fold: 1) that external candidates are attracted to organizations whose constituent employees share similar personalities, values, and interests; 2) that constituent professionals of an organization tend to select external candidates who share similar personalities, values, and interests to become a part of their organization; and 3) that employees that are a part of the organization that have more dissimilar personalities, values, and interests than the rest of the organization are more likely to attrite. These forces cause the organization to become homogeneous with respect to personalities, values, and interests among its employees, restricting the range of types of people within them (Schneider, 1987).

For the ASA model, the “focus, or level of analysis...is on the organization” (Schneider, 1987: 440). While the ASA model has many implications for the individual person focused disciplines of human resources and organizational behavior, there are many reasons to believe that it has even greater implications for more organizationally

focused disciplines of organizational theory and strategy. The type of persons that makes up a particular organization is a reflection of the organizational goals (Schneider, 1987; Schneider et al., 1995). As organizational goals are the driving force behind the strategy of a firm (Hitt et al., 2009), attracting, selecting, and retaining human capital that align with those goals are an important aspect of strategy implementation. The homogeneity that ASA engenders in an organization is thought to directly support the “enactment of specific policies and practices...that yields an organization characterized by unique structures, processes, and cultures” (Schneider et al., 1995: 753). Over time the ASA cycle is thought to produce increased homogeneity in human capital attributes (Schneider et al., 1995), which makes the organizational structures, processes, and cultures rarer and more difficult to imitate because of the path dependence in accumulating and bundling increasingly similar human capital (Barney, 1991; Dierickx & Cool, 1989).

The ASA model has had a great theoretical impact on the organizational attraction, selection, and turnover literatures which consider individuals as the unit of analysis. However, Schneider and colleagues point out that testing the “ASA model must be at the organizational level of analysis” (1995: 766). Despite this insistence, relatively little empirical work examining firm-level implications of the ASA model have been explored (Ployhart et al., 2006). The difficulties in collecting this type of data across many firms are a likely culprit for this relatively small body of empirical work examining firm level outcomes of the ASA model (Schneider et al., 1995). The studies that have been done have shown broad and robust support for the model. Schneider and

colleagues found that managers across 142 firms in a host of different industries showed that personality attributes were homogeneous at both the industry and the organizational level of analysis (Schneider et al., 1998). Similarly, Ployhart and colleagues (Ployhart et al., 2006) found that the ASA model created homogeneity within both organizations and job-units in service firms. This homogeneity predicted increased job satisfaction and performance, whereas greater variance (i.e., heterogeneity) of personalities within units is negatively related to satisfaction and performance. Zardkoohi and colleagues (Zardkoohi et al., 2011) have demonstrated that within law firms' top management teams greater homogeneity in gender, ethnicity, and age is negatively related to organizational performance, whereas deeper levels of cognitively-based homogeneity, argued to be reflected in similar educational backgrounds, is related to improved organizational performance.

Studies examining the demographics of TMTs have also applied the ASA model to explain the persistence of homogeneity of TMT members' human capital. Nielsen (2009) showed support of the ASA model in TMTs when the industry is more munificent and when the TMT has an already high degree of homogeneity. However, she also found that firms tend to have more heterogeneity in their TMTs when they have greater levels of international diversification and are in more dynamic industries. Partially contrary to Nielsen's findings, Boone and colleagues (Boone, van Olffen, van Witteloostuijn, de Brabander, 2004) found that increased complexity and external threats increase the likelihood of homogenization among TMTs. Outcomes of TMT

homogeneity have been explored, which suggest that contingencies such as firm strategy (Carpenter, 2002) determine the homogeneity-firm performance relationship.

Quantity of Professional Human Capital Flows – Employee Mobility and Turnover

Though the ASA model provides a basis for understanding the drivers of specific human capital flows within organizations, the RBT has been the dominant theoretical lens used to explain firm variance in human capital and strategic human resource practices (Chadwick & Dabu, 2009; McMahan, Virick & Wright, 1999; Wright, Dunford, & Snell, 2001). This perspective maintains that a firm's human capital stocks are dynamically updated with flows (Dierickx & Cool, 1989) of human capital via managerial practices of selecting employees (Helfat et al., 2007; Sirmon et al., 2011; 2007; Chadwick & Dabu, 2009). However, this perspective has been relatively silent on the loss of human capital resources that results from unintentional divestment from the firm, i.e. voluntary turnover (and not tactical lay-offs or firings). Perhaps this is the case because of the complications of human capital rent appropriation, causal ambiguity of the human capital – organizational performance linkage, and presumption of the control of resources outlined above within the RBT tradition. As such, I will consider the largely phenomenological and eclectically theoretical literature on the effects of turnover and human capital acquisition on firm performance and competitiveness.

The organizational impact of outward flows of human capital has largely been shown to be negative. Employees have the property rights associated with their own personal knowledge of organizational routines and other valuable firm knowledge (Foss

& Foss, 2005; Coff, 1999; 1997). Thus, when employees, particularly professional employees, choose to leave a firm, they control a potentially substantial portion of the firm's intangible resources. This complication has been described as a “market failure” as there typically is no compensation or guarantee that the employee will not use that knowledge to the detriment of the exited firm (Kochan & Litwin, 2011; Kraaijenbrick, Spender & Groen, 2010). Empirical research has supported this perspective, as exiting employees have been shown to erode competitive advantage of firms (Aime et al., 2010), increase the risk of dissolution or other firm mortality (Pennings & Wezel, 2007; Philips, 2002; Wezel, et al., 2006), increase the risk of competitive escalation among rivals (Gardner, 2005), decrease the social capital of the organization (Broschak, 2004; Dess & Shaw, 2001; Nixon, Hitt, Lee, & Jeong, 2004), and decrease unit efficiency and performance (Kacmar et al., 2006; Koys, 2001; McElroy, Morrow & Rude, 2001; Shaw, Jenkins, Delery & Gupta, 1998; Siebert & Zubanov, 2009).

Scholars have lamented that the predominance of human capital outflows from firms is an unfortunate reality of the “new relationship” between firms and their employees (Appelbaum & Berg, 2000; Capelli, 2008, 2000a; 2000b; Schultze, 2000). In the constant quest for short-term profitability by publically traded firms, one of the simplest and fastest ways to improve current quarter profitability has been to downsize (Nixon et al., 2004). Further, it has been argued that professionals under-invest in human capital already in the firm by way of on-the-job training and retention programs because its own stock of human capital is undervalued (Kochan & Litwin, 2011). Blair and Kochan summarize this perspective with the farming analogy of the “corporate sector

eating its seed corn in some sense – getting a temporary boost in earnings by cutting payrolls and contracting out more work but failing to make the necessary new investments in training and building a committed and innovative workforce” (2000: 2).

This view is tempered by other research suggesting that outflows of human capital have some beneficial outcomes for the focal firm. Studies have shown that some degree of turnover can be beneficial to firm innovation and performance, but this relationship follows a curvilinear inverted-U shaped pattern such that the turnover-performance relationship becomes negative after a low threshold (Madsen, Mosakowski & Zaheer, 2003; Pennings & Wezel, 2007; Siebert & Zubanov, 2009). This line of reasoning suggests that some “new blood” from the outside keeps complementary knowledge (Makri, Hitt & Lane, 2010) and explorative learning (March, 1991) closer to optimal levels without disrupting exploitative organizational processes (Madsen et al., 2003). Siebert and Zubanov (2009) explained this bifurcation phenomenon by demonstrating that low-commitment, contract human capital followed this inverted-U curvilinear effect, while turnover of high-commitment, full time, high-value employees (i.e., core employees; Lepak & Snell, 1999) showed a completely negative relationship with performance. However, in more knowledge intensive industries, some turnover of high-value human capital may be beneficial from backflows of knowledge from the exited employees (Dokko & Rosenkopf, 2010), as the exited employees provide the potential for expansion of the market ties at the periphery of the firm (Somaya et al., 2008) and assist in bringing in new knowledge or new customers.

Acquiring human capital also has benefits for the destination firm. For example, Rao and Drazin (2002) showed that recruiting from rivals helps firms overcome resource constraints on innovation. Aime and colleagues (2010) showed that hiring from innovative competitors improved the competitive parity for organizations that were previously at a competitive disadvantage. New employees not only bring new knowledge, but can also prevent organizational inertia by disrupting and questioning organizational routines (March, 1991).

There is also evidence that acquiring new human capital can be detrimental for destination firms. In order to induce an employee to switch firms, the utility of compensation package at the new firm must exceed the compensation package at the focal firm, plus any switching costs for the employee (Becker, 1964). As the value of the employee at the focal firm is based partially on their firm specific human capital, that employee is likely to be compensated above the market rate for her or his services (Becker, 1964; Sturman, Walsh & Chermie, 2008; Wang & Barney, 2006). It follows that firms that attract human capital from rivals may possibly pay a premium beyond the value of that employee. Groysberg and colleagues (2008) found evidence to support this logic, as “star” employees who switch firms do not typically perform at the new firm as well as they did at the old firm, yet presumably were compensated higher. Additionally, rival firm poaching of any employees can lead to competitive retaliation (Gardner, 2005), which can in turn erode profits from the firms engaged in such competitive escalation (Makadok, 2011).

Higher employee mobility between firms can benefit the industry as knowledge can be dispersed to change institutions (Kraatz & Moore, 2002), create new product markets (Boeker, 1997), improve organizational routines (Aime et al., 2010) and create new ventures (Philips, 2002; Wezel et al., 2006). However, there is ongoing debate whether or not it is beneficial for firms to gain employees (Sherer, 2008), and while there is some consensus that losing core employees is generally negative for firms, there are specific instances in which it may actually be positive (e.g., Dokko & Rosenkopf, 2010; Somaya et al., 2008).

Summary of Current Literature Limitations

The current literature on the value to the firm of PHC flows has several limitations. PHC is a resource that has several confounds when examining its value to the focal firm (Coff, 1997; Kraaijenbrick, 2011). Among these is the agency of professionals who determine the extent to which they deploy their human capital for the benefit of the firm (Spender, 2011). Professionals also create value through the subjective use of resources (Foss, et al., 2008; Penrose, 1959) and orchestrating resources in alignment with the external environment (Sirmon et al., 2011; 2007) and internal environment (i.e., strategy; Sirmon & Hitt, 2009). These ongoing behaviors are often difficult to capture with typical archival data when studying RBT (Molloy et al., 2011). The lack of understanding regarding the causal mechanisms of PHC creating firm rents is also problematic (Blair, 2011), especially considering professionals' ability to appropriate rents (Coff, 2011; 2010; 1999).

Given these limitations in our understanding of PHC's value as a resource, it is no surprise that there is ambiguity concerning the effect of PHC flows on firm performance (Sherer, 2008). The literature on the replacement strategies for PHC appears equally vague. There is little work that has been done on the quality of PHC that flow from organizations – instead, studies explore gross amounts of employee turnover without considering *who* it is that leaves the firm. The quality of human capital is not considered in these mobility studies (for an exception, see Groysberg et al., 2008). Further, contextual factors may determine the extent to which human capital flows create value (Broschak, 2004; Brymer et al., 2011; Coff, 2011; Nyberg & Ployhart, in press) such as firm strategy and structure, yet these factors remain understudied in the literatures reviewed in this chapter.

The ASA model asserts that firms become more homogeneous over time with respect to their PHC. This perspective suggests that there are drivers behind resource orchestration structuring actions of PHC that are biased and may not necessarily support the goal of profit maximization – e.g., hiring a professional that is most like existing professionals rather than the professional that would have the most value. It is unclear the conditions under which the acquisition of more similar PHC is most likely to happen, and it remains an understudied phenomenon (Ployhart et al., 2006; Schneider et al., 1995). Understanding the more nuanced drivers of PHC acquisition under various firm-level contingencies will allow us to make light of the drivers behind these resource orchestration actions.

The following chapter presents a model that addresses the limitations in the literature outlined to this point. PHC is central to the competitive advantage and performance of the firm, yet we do not understand much about the performance implications of its outflows or how firms replace it. What follows examines these two important questions and extends RBT, the ASA model, and human capital theory by considering contextual variables surrounding PHC flows.

CHAPTER III

THEORY AND HYPOTHESES

Management of the firm's human capital, including its PHC, has been described by scholars as one of the (if not *the*) most important strategic considerations for organizational leadership (e.g., Hitt & Ireland, 2002; Pfeffer, 1994). Given the strategic implications of PHC, this dissertation considers the firm performance implications of its outflows and how firms restructure their resource portfolio by acquiring similar (or not) PHC.

This chapter considers the three attributes of the PHC outflows theorized to affect performance, namely the quantity, the quality, and the similarity of the PHC. These attributes are each chosen for their connection with the previous literatures as reviewed in Chapter 2. The quantity of PHC flows parallels the professional mobility and turnover-firm performance research streams, as they consider the amount of individuals that flow in and out of an organization in a given timeframe. The quality of PHC is tied to our definitions of general and firm specific human capital, as well as the concept of value in RBT. The similarity measure is chosen for its applicability within the ASA literature, as well as the concept of similarity of resources within RBT. Each of these dimensions is described individually as a base for understanding why and when these flows affect firm performance and replacement actions. Quality and quantity are key constructs in the development of the PHC outflows to firm performance section of

the model (hypotheses 1-4). All three attributes of PHC flows are present in the outflows to similarity of inflows section of the model (hypotheses 5-10).

Performance Effects of Resource Outflows: Losing Professional Human Capital

Quantity of PHC Outflows and Firm Performance. The effect of the quantity of human capital loss is the most studied dimension of human capital flows for firm outcomes (e.g., Hancock et al., in press; Holtom et al., 2008; Kacmar et al., 2006; Koys, 2001; Pennings & Wezel, 2007; Seibert & Zubanov, 2009; Shaw et al., 1998). The relationship has typically been found to be negative (Hancock et al., in press).

These studies have considered total firm turnover or specific groups of employee turnover on firm performance, such as professional turnover. This prior research has shown that firm performance is negatively affected by the volume of PHC outflows (e.g., Siebert & Zubanov, 2009; Wezel et al., 2006). When many professionals depart, they are not only more difficult to replace and subsequently socialize than non-professionals (e.g., skilled labor that perform repetitive manual tasks), but also their loss is more disruptive to the remaining capabilities. Consistent with this reasoning, Dess & Shaw (2001: 180) “argue that a necessary condition for competitive advantage is a low voluntary turnover rate among the strategic core work force”, i.e. employees that support core competencies. These employees are, at least in part, the professional work force in the organization.

High volumes of professionals leaving the firm can cause a multitude of problems. The firm loses knowledge, particularly tacit knowledge, whenever a

professional leaves. As a potential VRIN resource, knowledge that is lost can erode competitive advantage and/or the capability to achieve one by disrupting the development or maintenance of core competences, capabilities (Felin & Hesterly, 2007), and routines (Wezel et al., 2006). In general, professionals also control greater endowments of knowledge vs. non-professional employees (Lepak & Snell, 1999). Professionals also are typically paid higher compensation, inducing them to make greater investments in firm specific human capital (Wang et al., 2009), which in turn could lead to a higher likelihood that the firm has a competitive advantage in its industry (Wang & Barney, 2006).

Professionals, including higher level managers, in organizations are more likely to be external boundary spanners (Geletkanycz & Hambrick, 1997). Professionals, especially in professional service firms, often have oversight of client, supplier, and other external stakeholder relationships. These relationships can provide greater access to external resources, better information about the competitive environment, and can form the basis of social complexity that may be difficult for competitors to imitate (Barney, 1991). When professionals leave the organization, these external ties may be severed from the firm (Phillips, 2002). The consequences of the PHC outflow are decreased access to resources, poorer environmental sensing, and loss of potential inimitable ties, which in turn would lead to poorer firm performance outcomes (Wezel et al., 2006).

Similarly, professionals hold or manage much of the social capital that connects various firm functions, routines, and capabilities (Pennings & Wezel, 2007; von

Nordenflycht, 2010). The knowledge of particular routines that professionals hold may be the basis of a competitive advantage, which can be eroded if they exit the organization (Aime et al., 2010). Professionals with firm specific knowledge of routines and capabilities are difficult to lose, as their knowledge of how to orchestrate resources may be both complex and unique to each individual. As large quantities of professionals voluntarily leave an organization, particularly if it is unexpected, it is possible that other professionals from within are not trained to perform the job functions of the exited professionals. Even if succession plans are in place or flexible human resource systems have cross-trained professionals in various roles to avoid unskilled replacement of PHC, there are likely to be learning curve effects when new duties are first assumed along with decreased inefficiencies associated with the increased workload for the replacement professional.

Increased levels of PHC outflows challenge remaining employees to replace resources, particularly the enacted knowledge within the exiting professionals. Not only are capabilities and routines more disrupted with high quantities of flows, but as large numbers of professionals leave, it dissolves slack that remaining professionals have in their daily workloads. Remaining professionals must assume the tasks previously performed by the ones who exited. They must also expend the effort to perform all the functions of replacing the outflowing PHC: search, selection, training, socialization. This compounding effect on costs of increasingly high levels of human capital flows explains the typically strong negative effect on firm performance (Holtom et al., 2008; Koys, 2001; Pennings & Wezel, 2007; Shaw et al., 1998).

Consistent with the theory and findings put forth by Seibert and Zubanov (2009), the quantity of PHC outflows is expected to have a negative relationship with firm performance. Professionals are high commitment employees, often with equity stakes in the firm (Pennings & Wezel, 2007). Unlike the outflows of low commitment employees, which have been shown to have a curvilinear, inverted-U outflow-performance relationship that is positive for low numbers of outflows, losing even a small number of professionals is expected to have a negative effect to subsequent firm performance (Seibert & Zubanov, 2009).

Hypothesis 1. There is a negative relationship between the quantity of professional human capital outflows and firm performance.

Quality of PHC Outflows and Firm Performance. The quality in PHC can be considered as professional knowledge and skills that are able to provide greater benefit to the firm by better decision-making, more effective resource orchestration, higher intelligence, and more effective knowledge (Schultz, 1975). The quality of PHC is equivalent to the caliber of the aggregate of general and firm specific knowledge and skills possessed by one professional or a group of professionals that allows them to create benefits for the firm (Crook, Todd, Combs, Woehr, & Ketchen, 2011; Ployhart & Moliterno, 2011; Becker, 1964).

Interestingly, the vast majority of studies linking professional flows to firm performance do not consider the attributes of human capital outflows beyond the volume and the job level of the professionals (Hancock et al., in press; c.f. Nyberg & Ployhart, in press), presumably because professionals within the same job level are assumed to

possess roughly the same amounts of individual human capital. The quality of professional employee outflows, however, can vary considerably at the same level within the same organization. For instance, the quality of every vice-president (VP) across a particular firm is not homogenous and therefore the outflow of any particular VP is likely to be different from the outflow of another VP. Certain VPs perform better, some VPs have rarer skills (Castanias & Helfat, 1991; 2001), some VPs are able to extract more value from their subordinate employees, and certain VPs appropriate less rent for themselves (Coff, 1999) – all of which increase the value of those VPs to the firm. Therefore, the extent to which organizations suffer from PHC loss depends in part on the quality of those exiting professionals, i.e., the aggregate skills and knowledge possessed (Becker, 1964) by those professionals. Stated otherwise, *who* leaves the organization, in addition to the quantity and job level of those professionals, is likely to influence subsequent firm performance.

The quality of PHC flowing into and out of an organization can be a double-edged sword, though. On one hand, higher quality of PHC denotes greater knowledge and more advanced skills, which can lead to a host of positive organizational outcomes through improved decision making, more effective and efficient individual performance, and better integration with coworkers and the routines within the firm. As resources, higher quality PHC is rarer and more valuable, *ceteris parabus*. Quality PHC is more likely to be a source of competitive advantage for a firm, particularly as high quality human capital is accumulated over time (Dierickx & Cool, 1989; Maritan & Peteraf, 2011).

Outflows of high quality PHC are problematic for firms. As high quality PHC is more likely to be rare and valuable, the search, selection, and acquisition costs for recovering from its loss are greater. The roles vacated by higher quality PHC are more difficult to perform in the absence of the outgoing employees, and the time-to-competence for learning the roles vacated by the outflowing employee is often longer as the tasks are likely to be more firm specific and complex (Hatch & Dyer, 2004; Wang & Barney, 2006).

On the other end of the spectrum are professionals with low quality PHC. These professionals are unlikely to perform tasks that are as complicated, interdependent, or strategically critical as those with high PHC, *ceteris paribus* (Lepak & Snell, 1999). Upon the loss of low quality PHC, a firm could more quickly recover from its loss by replacement in the labor market or by other stock employees assuming the vacated roles. In abundant labor markets, the replacement is likely to be very quick, as low quality PHC is less rare than high quality PHC (Becker, 1962). In tighter labor markets, firms that lose low quality PHC would be able to use its stock of remaining resources to perform the tasks vacated by the outgoing professionals without as much disruption to routines or practice.

When considering the joint effects of quality and high quantities of PHC simultaneously, larger differences are likely to emerge. Losing high amounts of low quality PHC does not present a difficult scenario for a firm – even in large amounts, the PHC loss would not likely be extraordinarily detrimental because of the relative abundance of similar talent in the market, and because of the relative ease of adjusting

routines temporarily to compensate for lost professionals. High quantities of high quality loss, though, compound the negative effect of both phenomena – unique firm capabilities are more likely harmed and there is high need for slack and other-use resources to be utilized in order to maintain organizational momentum in this scenario.

Losing high quantities of high quality PHC is likely to compromise a firm's competitive advantage. PHC resources that are high quality are rarer and more valuable when bundled with organization-specific routines that have co-evolved in their presence (Barney & Wright, 1997). The professionals, particularly if they have had long tenures at the firm, have contributed to the creation of the environment in which they perform (Schneider, 1987). Higher quality professionals are likely to create more complex routines that complement their advanced skills, knowledge and abilities. The orchestration of the resources under their control is more likely to be efficient, the resources bundled appropriately, and the actions more aligned with the external environments (Sirmon et al., 2008; Sirmon & Hitt, 2009). When high quality PHC leaves in large numbers, it is less likely that firms will be able to replace them or replicate the actions that they take orchestrating resources (Sirmon et al., 2011). The loss of high quality PHC can also diminish the value of the resources with which it was bundled (Wernerfelt, 2011) as the remaining resources are likely to have had higher value bundled with greater knowledge and skill of resource use (Foss et al., 2008; Penrose, 1959). Prior to such loss, high quality PHC co-evolves with other firm resources, building rich and complimentary bundles (Dierickx & Cool, 1989; Kogut & Zander, 1992) that provide the basis on which competitive advantage is able to be realized

(Barney, 1991; Sirmon et al., 2007). With these diminished resources and capabilities as high quality PHC exits the organization, it is expected that high quality PHC loss to be more detrimental to firm performance when it is also of high quality.

Scholars have theorized the differing effects between general and firm specific human capital stocks on firm performance (e.g., Hitt et al., 2001; Wang & Barney, 2006), or when they negotiate entry into the firm from external markets (Becker, 1964). However, the performance effects of these two types of human capital have not been studied in the context of exits from the firm. Firm specific human capital plays a more critical role to competitive advantage for firms, and general human capital can augment and quicken the development of firm specific human capital (Campbell, Coff, & Kryscynski, in press; Molloy, Ployhart & Barney, 2012; Morris, Alvarez, Barney & Molloy, 2011; Sherer, 2008). Further, the exit of high quality general human capital is a more visible signal in the marketplace (Spence, 1973), which could discourage the development of further relationships between customers and cooperative firms. As such, the losses of high quality general and firm specific human capital are both expected to negatively moderate the outflow-performance relationship.

Hypothesis 2a. The quality of general professional human capital outflows negatively moderates the quantity of outflows-firm performance relationship, such that increased quality outflow strengthens the negative quantity outflow/performance relationship.

Hypothesis 2b. The quality of firm specific professional human capital outflows negatively moderates the quantity of outflows-firm performance relationship,

such that increased quality outflow strengthens the negative quantity outflow/performance relationship.

Bundling, PHC Outflows, and Firm Performance. As professionals exit an organization, the capabilities (bundles) that they disrupt (and possibly destroy) in a firm's repertoire are not homogeneous across firms, even given an identical amount of outflow quantity. This is because PHC embedded in the organization has a range of values depending on the context of the organization and the manner in which it is bundled with other firm resources (Barney & Wright, 1997; Coff & Kryscynski, 2011; Maritan & Peteraf, 2011).

One important dimension of firm bundling of PHC is the number of subordinates per manager. This bundling creates relationships between organizational members who possess human capital, interdependent relationships of coworkers in the same group or division. The bundling ratio of subordinates per professional in an organization, also known as leverage, has important implications for firm strategy and performance (Chandler, 1962; Hitt et al., 2001; Sherer, 1995). Firms with low leverage, i.e., few subordinates per professional, tend to be more structurally hierarchical and place greater functional (e.g., client specific) activities with the professionals. With fewer employees to orchestrate, professionals can focus more attention on other resources, on handling clients, and on practicing the more specialized functional tasks of their profession (e.g. an accounting professional has more time to work on clients' tax returns). Firms with higher leverage do not have this luxury or flexibility in professional activities. Bundling more employees per professional creates greater demands on every professional to exert

effort in the orchestration of their employees. The discretion of how professionals spend their days is diminished, as greater numbers of subordinates place higher demands on professionals. For instance, greater numbers of subordinates seek knowledge transfer in activities such as training and socialization. Deploying more human capital for value-creating activities, such as introducing and dedicating employees to clients, also puts increased pressure on professional time and effort.

The outflows of PHC, thus, are likely to have different implications for firms with different types of interdependencies among its professionals. In high leverage firms, the outflows of PHC are likely to compound the negative effects of the outflows. Professionals in high leverage firms already have many demands placed on their time with large numbers of employees to manage. Outflows of PHC from these firms place even greater burdens on the remaining professionals, as the resources once orchestrated by the exiting professionals now must be orchestrated by those who remain. This is likely to cause inefficiencies – remaining professionals may not possess much knowledge of the former professionals' employees, which can lead to poor decisions on how those employees are deployed. Further, the remaining professionals' time becomes more scarce with the increased load of resources to orchestrate, which may result in subordinates receiving less instruction/direction and they may therefore work in ways that does not efficiently use their human capital.

Conversely firms that bundle fewer employees per manager likely have greater flexibility with respect to professionals' roles, and can absorb an outflow more effectively.. With fewer subordinates to manage, there is less knowledge of employees'

human capital to learn and greater ability to assume responsibilities of deploying those resources soon after a professional departure. Although lower leverage firms likely have professionals who have more client specific knowledge (Hitt et al., 2001), and may be able to appropriate some of the value from that relationship as they change firms, the greater flexibility of the remaining professionals to respond to increased responsibilities left by the exited professionals is likely to reduce changes in the relationship with the client.

Hypothesis 3. The leverage of the firm negatively moderates the quantity of outflows-firm performance relationship, such that low leverage weakens the negative relationship.

A similar logic to the leverage-outflow-performance relationship applies to a firm's geographic diversification strategy. The diversification strategy of firms has implications for their performance (e.g. Fang, Wade, Delios & Beamish, 2007; Hitt, Hoskisson, & Kim, 1997; Palich, Cardinal & Miller, 2000), and is therefore an important bundling characteristic in which to consider the flows of PHC.

Geographically diverse firms have sets of professionals dispersed throughout many markets, whereas geographically focused firms may have one or a few locations with co-located professionals. As Barney and Wright (1997) have argued, the ability of a firm to gain a competitive advantage from its human capital depends on the conditions in which the human capital is bundled within the organization, such as the manner in which it is dispersed or in various geographic locales. An important dimension of this human capital is tacit knowledge, which is embodied knowledge that is typically more complex

and less imitable (Polanyi, 1962; Tsoukas, 1996; Wang & Barney, 2006). Tacit knowledge, unlike codified knowledge, largely flows between individuals that are co-located (Argote & Ingram, 2000; Hitt et al., 2001; Nonaka & Takeuchi, 1995). As firms diversify geographically, the exchange of tacit knowledge between professionals becomes less frequent and more difficult. While firms gain new markets and new knowledge with geographic diversification, there is a cost of less frequent and poorer knowledge exchange because fewer professionals are co-located. This has been one of the fundamental logics explaining the curvilinear diversification-firm performance relationship through decades of research (Palich et al., 2000).

The outflow of PHC is likely to affect the competitive advantage of geographically diverse firms more drastically than those that are geographically focused. The outflow of professional tacit knowledge from an area represents a weakened resource position, as the firm no longer can leverage that knowledge for advantage. Much of that knowledge is location specific and a function of the geographic bundling of that PHC. With greater dispersion of PHC, when outflows do occur, there are fewer co-located professionals to assume the orchestration of the resources formerly under the control of the exited professionals, *ceteris parabus*. Because knowledge of the use of various resources is subjective (Foss et al., 2008) and tacit, there is a decreased likelihood that the exited professional had opportunities to pass that knowledge on to a large number of other professionals in geographically diverse firms. For those professionals that received knowledge from exited professionals in geographically diverse firms, there is less likelihood that the duties of orchestrating the exited

professionals' resources would be shared. With a larger number of resources to manage, the efficient orchestration of those resources critical to firm performance (Sirmon & Hitt, 2009; Sirmon et al., 2008) is probably diminished. This is particularly true as products are more specialized to local markets and when the institutional environments have greater variance across locations, as is the case of law firms where knowledge of municipal, state/provincial, or national laws can be critical.

Outflows of professionals leaving from geographically focused firms are likely to be less harmful to a firm's potential competitive advantage. Tacit knowledge can be passed among co-located professionals and duplicated (to some extent; Nonaka & Takeuchi, 1995). When PHC exits, redundancies of knowledge are more likely to exist as the concentration of professionals in a particular location is high. Further, tasks vacated by exiting professionals can be spread among a larger number of co-located professionals with geographically focused firms. While some inefficiencies of resource orchestration are likely inevitable when those activities are transferred from one professional to another, the impact is likely to be curbed with greater geographic focus.

Hypothesis 4. The geographic bundling of the firm's PHC moderates the quantity of outflows-firm performance relationship, such that increased geographic diversification strengthens the negative quantity of outflow/performance relationship.

Replacing Professional Human Capital with Resources Similar to Firm Stocks

PHC Replacement Similarity. One attribute of PHC that may unlock its value is the degree of similarity of resource to the endowment of resources already in the firm (Barney, 1988), and specifically, the degree to which it is similar to other PHC (Ployhart et al., 2006). Stocks of PHC with degrees of similarity have been shown to be correlated with units and firms performing better (Ployhart et al., 2006; Zardkoohi et al., 2011), suggesting that there are efficiencies in organizing with similar PHC which allow for the emergence of well-functioning groups and organizations (Ployhart & Moliterno, 2011).

The ASA model suggests that inflows (outflows) of PHC will become increasingly similar (dissimilar) as firms continuously attract, select and attrite professionals (Schneider, 1987). It is, though, unclear the conditions under which the ASA model accurately describes firm actions of structuring activities, as organizations do not always acquire PHC that is exactly the same as the stocks of PHC that reside in the firm (Schneider et al., 1995). In light of this, similarity of PHC flowing to/from the firm has critical implications for firm differentiation from competitors. Resource (PHC) similarity is defined herein as the degree of sameness of flowing resources (either in- or out-flows) to the static stock of resources in the focal firm (which hereafter is referred to as *similarity*).

PHC could be similar in various ways. These include personality (Ployhart et al., 2006), values held (Schneider, 1987), demographic dimensions (Carpenter, 2002; Hambrick & Mason, 1984), and task/functional (Becker & Murphy, 1992) similarities, among others. The homogeneity of each attribute within a firm could have a different set

of firm level outcomes with which it is associated. Likewise, each of the flows of these similarity dimensions may have differential effects on firm outcomes. For instance, flows of geographically similar PHC may be associated with the degree of knowledge spillovers in a particular region, or flows of demographically similar human capital may be associated with a change in the way decisions are made by a top management team (Carpenter, 2002; Hambrick & Mason, 1984).

Professional Formative Experience as Similarity Dimension of PHC. The ASA model focuses on similarity of human capital attributes (Ployhart & Moliterno, 2011) that are typically stable and longer lasting such as values and personality (Schneider, 1987). The earliest professional experiences for employees can have important and lasting ramifications throughout one's career, as they are a primer for the values one has within a profession. These early professional experiences are often the initial career condition that becomes path-dependent, as many professionals revert back to their behaviors and knowledge gained in early training in a particular field (Haggins, 2005). For instance, in academia, the institution where one receives a Ph.D. can have lasting effects on the type of research that person does throughout a career, the places where one is employed, the identity one has (Adler & Adler, 1988), and the salaries that one commands (Gomez-Mejia & Balkin, 1992). Another example of an early professional experience that has a lasting effect can be observed in former General Electric professionals. Many companies poach employees who started their careers at GE as these individuals mature and are ready for senior management positions. Companies hire former GE professionals for many reasons. GE has stringent selection criteria for new

employees, and thus they fit a certain value and personality type and have high general human capital (Schneider, 1987). GE's professional and leadership development program is considered by many to be the best in the world. Upon leaving GE, former professionals have excellent social capital through networks of many of the corporate elite (Lehmberg, Row, White, & Phillips, 2009). GE is a classic example of an “academy company” that instills formative training on its professionals that shapes their entire careers (Cappelli & Hamori, 2005).

Because these early professional experiences can create such lasting and distinctive value systems, patterns of behavior, and identity, they can be thought of as a characteristic of similarity within the ASA model. Therefore, I introduce the concept of *professional formative experience* (PFE, hereafter) that is defined by the socialization, training, and knowledge gained early in one's career, typically within a particular organization and specific to a particular industry. PFE can be considered a subset of PHC. Professionals can gain PFE at an “academy company”, like GE, working for another organization, such as the Peace Corps, or at a university or trade school while creating the knowledge and skills needed for their careers.

PFE similarity operates in many ways as professionals move from one organization to another. Before exploring the theoretical mechanisms regarding the firm replacement strategies of similar PFE, it is necessary to explain why PFE is important for individual knowledge, performance, and motivations, and for interdependencies between professionals.

There is a large degree of self-selection into early career experiences (Schneider et al., 1995). Individuals choose to apply to universities, professional schools, and their first full-time jobs based on their interests, abilities, personalities, and alignment of values with those organizations. Likewise, these organizations select applicants who have similar interests, abilities, personalities, and values with the other people already within the organization (Ployhart et al., 2006; Schneider, 1987; Schneider et al., 1998). These early choices of PFE may serve as a signal to the labor market (Spence, 1973) regarding the interests, abilities, personality and values a particular person possesses (e.g. Ho, 2009). These signals may be particularly powerful, as early career organizational choices may be viewed as more clear indications of stable attributes (e.g. Roberts & DelVecchio, 2000) held by individuals, and not complicated by personal constraints (e.g., family considerations) that typically are stronger during the middle and later portions of a career (Hewlett, 2002). For example, the *Wall Street Journal* (Evans, 2010) recently ranked Texas A&M University the second best school in the nation for the employability quality of its graduates, a recognition that is at least partially due to the type of students Texas A&M attracts, specifically those who have a particularly strong work ethics, and value character development highly in their own personal priorities. These characteristics differentiate Texas A&M graduates from graduates of competitor schools (Moses, 2011). In this case, PFE of these employees is the attendance at Texas A&M, where students typically gain human capital specific to their industry while also being selected into and socialized within the cultural context of Texas A&M, which has differentiated itself from competitors with respect to the employability of its human

capital “products” (Evans, 2010). Similarly, the most prestigious Wall Street firms hire their new financial analysts almost exclusively from highly selective Harvard University and Princeton University, as these PFEs are a signal to those firms' clients that their analysts are the “smartest people in the world” (Ho, 2009: 2).

Organizations, such as universities and “academy companies” (Cappelli & Hamori, 2005), where PFE is conferred typically put much emphasis on training and development. Indeed, this is the primary purpose of a university education (Boyer, 1990), as students gain knowledge and skills that will serve them the rest of their careers. Professional firms that employ new graduates also have a greater focus in socializing and training new hires in the norms of the industry, the culture of the organization, and the best practices within the organization (Brymer, 2010). Such experiences have lasting effects on employees, serving as initial path defining events that begin the trajectory of a career (Gomez-Mejia & Balkin, 1992) but can also create path dependence in future learning (Cohen & Levinthal, 1990). These “career imprints” (Haggins, 2005) from “academy companies” (Cappelli & Hamori, 2005) can serve as the basis of schema (i.e., mental models) about an industry (e.g. Spender, 1989) or organization (e.g. Walsh, 1995), creating strong organizational identification within its alumni (Adler & Adler, 1988; Cappelli & Hamori, 2005), and serving as a signal of the human capital possessed by an individual in the labor market (Ono, 2004; Weiss, 1995). Many scholars have noted the importance of PFE in the development of some of the most valuable human capital, namely the TMT members of *Fortune 500* companies (Cappelli & Hamori, 2005; Haggins, 2005; Lehmberg et al., 2009; Useem, 1979; Useem & Karabel, 1986).

It is not surprising that similarity of backgrounds within top management teams has been studied, as the resource bundles of the top professional managers have been shown to influence firm strategy and decision making (Carpenter, 2002; Finkelstein et al., 2009). Far less attention has been focused on the manner in which similarity in non-TMT employees affects organizational-level outcomes. Some have argued that PFE similarity within an organization's "rank and file" employees produces greater efficiencies in recruiting similar candidates externally, training and socializing new hires (Brymer, 2010), creating and maintaining efficient routines (Brymer et al., 2011), creating a deeper, more cognitively based similarity within its human capital (Zardkoohi et al., 2011), and creating legitimacy in product markets (Ho, 2009). PFE similarity between coworkers can foster communicative exchange, and interdependent task efficiencies, as the shared mental models, common language, shared norms, shared values, and mutual trust are outcomes of these shared formative experiences early in one's professional career. Similar to a "cohort effect" (McCain, O'Reilly, & Pfeffer, 1983), in which a group of individuals have shared experiences because they entered an organization at the same time, groups of individuals with similar PFEs share a common set of experiences, knowledge, mental models, organizational identities, and social capital (Lee & Brinton, 1996; Tajfel, Billig, Bundy, & Flament, 1972). Unlike the cohort effect, however, these shared experiences need not be temporally bound. For instance, two graduates of a particular professional school are likely to have similar knowledge, mental models of their field, and organizational identities even if they do not attend that school at the same time.

The cumulative set of shared cognitions and connections common to those with similar PFEs within each firm creates sets of heterogeneous human capital resources across firms, as no two firms are likely to have the same ratios of employees with particular PFEs. As human capital moves from one firm to another, it has different values as firms have heterogeneous stocks of PFE profiles, i.e., the mix of PFEs among all the individuals in the firm which compose the organization (Coff & Kryscynski, 2011). These firm differences are posited to create variation in the amount of synergies created, degrees of transaction costs, and types of resource structuring strategies incurred because of PHC flows.

PHC Outflows and PHC Replacement Similarity. To maintain continuity and prepare for future competition, firms replace human capital that leaves the firm. The unique attributes of human capital as a resource (Coff & Kryscynski, 2011) render its exact replacement impossible. As professionals each have unique configurations of knowledge and skills (Foss & Foss, 2005) and subjectivity (Foss et al., 2008), replacing one professional with another is certain to create a different bundle of resources, even if the human capital has many of the same attributes. Labor markets are also fraught with uncertainty (Akerlof, 1970; Spence, 1973), making the assessment of external PHC challenging.

When replacing PHC after an outflow, firms must decide how to react by (re)structuring their resources. They can either replace the PHC lost with that which is similar to that still present in the firm, consistent with the ASA model (Schneider, 1987), or choose to replace it with more dissimilar PHC in an attempt to gain different

knowledge (Makri et al., 2010). The choice is not an obvious one. Firms may partially base their decision on the external environment, aligning the choice of PHC acquisition to a market strategy (Sirmon et al., 2007) and the structure of the firm. Thus, it is important to consider the firm and other environmental contexts under which the ASA model is predictive of acquisition behavior.

The loss of a relatively large number of professionals presents many challenges to ongoing operations. Professionals who remain at the firm assume the tasks vacated by the outflowing professionals (Brockner, Grover, Reed, Dewitt & O'Malley, 1987), taking time away from functions that they were performing before the large departure. The remaining professionals may be focused on organizational recovery (Morrow et al., 2007), orchestrating their resources to salvage routines, knowledge, and capabilities that were eroded with the outflow of their former colleagues. This creates a relatively weak slack position within the firm, as the firm's constituents spend resources on activities that likely were not done prior to the exit – codifying or transferring knowledge from outflowing professionals, assuming functional duties of those professionals, and searching for and selecting replacement PHC. With a greater quantity of PHC that exits the organization, there is an accompanying strain on remaining firm resources, particularly PHC.

With the consumption of otherwise slack resources, firms' search to replace PHC is likely to cause economizing of subsequent PHC acquisition, *ceteris paribus*. Firms are likely to use existing external social capital to reduce search and information (Alchian & Demsetz, 1972) costs with the increased strains on their resources due to

PHC outflows. For instance, a professional searching for a new colleague to hire may be more likely to contact an old university friend or a former colleague from a prior job to inquire about interested job candidates when her/his slack resources are low. This approach is less costly than a nationwide search that would involve analyzing resumes and assessing the value of the qualified candidates. All else equal, shared PFE backgrounds beget networks (Lee & Brinton, 1996) in which focal firm employees can access an external labor market with fewer search and information costs, which are more attractive when slack resources are low.

Additionally, the acquisition of external professionals presents a potential threat of their appropriation of rents from the new firm, and thus, could represent a threat to the remaining professionals (Coff, 2002). Indeed, Briscoe and Tsai (2011) found that intra-unit client sharing among professionals decreases upon the acquisition of a new firm that have professionals who joined the focal firm's units (i.e., were integrated into the new firm). This finding suggests that professionals in firms are likely to lack trust and working norms with a group of professionals newly entering the firm. The larger this group of replacement professionals, the more threatening it is to the status quo in the firm. To ameliorate this threat, searching for replacement human capital using social capital (potentially due to similar PFE backgrounds) that provide access to greater information is a likely tactic used by remaining professionals. This logic suggests that with the loss of large quantities of PHC, firms are more prone to acquire resources similar to those already in the firm.

Conversely, low quantities of PHC outflows are not likely to constrain existing resources. Firms attempting to replace only a small amount of professionals are likely to have greater amounts of slack resources, which increase their proclivity to explore (March, 1991; Voss, Sirdeshmukh, & Voss, 2008) the labor market for professionals who can be used to create more unique resource configurations. External candidates with similar PFE profiles to the focal firm employees are more likely to have human capital that the firm already possesses. Thus, with the loss of a relatively small quantity of PHC, they are less likely to acquire resources similar to those already in the firm.

Hypothesis 5. There is a positive relationship between the quantity of PHC outflows and the subsequent similarity of PFE inflows.

Quality of PHC Outflows and PHC Replacement Similarity. The loss of high quality PHC threatens the creation or maintenance of a firm's competitive advantage. The remaining focal firm resources likely lose value, as many of them were bundled with the outgoing high quality human capital, together creating capabilities of the firm.

Upon the loss of high quality PHC, the remaining professionals at the firm may question the ability of the firm to recuperate the eroded capabilities. Given the uncertainties in the labor market (Alchian & Demsetz, 1972), the variability of potential bundles produced by new hires, and the relative difficulty in replacing a high quality PHC resource makes the hiring of more similar PHC a potentially prudent strategy. While it is unlikely that pre-outflow capabilities of the firm could be restored to a completely identical form, the socialization, training and knowledge transfer efficiencies gained by acquiring a similar PFE resources increases the odds that capabilities that were

unique and valuable to the firm are recuperated. In other words, similarity of PFE inflows to the stocks of PHC already at the firm increase the likelihood of shared mental models, common language, shared norms, shared values, and mutual trust. These help economize the costs of the PHC replacement as newly hired professionals assume the roles of the ones departing.

From an external perspective, high quality general human capital outflows are likely to be more visible within an industry, as the movement of industry “stars” (Groysberg et al., 2008) are tracked more closely by competitors (Chen, 1996) and other stakeholders. With the difficulty in replacing these outflows of high quality general human capital, remaining professionals may desire the replacement search to be a relatively private event – losing high quality general human capital professionals is a damaging signal to the market (Spence, 1973), but potentially even more damaging is the signal to the market of not filling those positions; it may be inferred that the inducements (Barnard, 1938) of working at the focal firm are not attractive enough to secure a replacement. In this scenario, professionals can use outside networks with which they share some PFE similarity (e.g., alumni networks from a particular school) as those searches are less public. A replacement with high PFE similarity to that of the firm is more able to assimilate into operations quickly, as the shared communications, socialization, and training are likely to help new hires get up to speed quickly. This may be particularly important with the large void left by the high quality general human capital PHC outflows. Both of these arguments suggest hiring similar PFE to that

existing in the firm, as predicted by the ASA model, after a high general human capital outflow.

While the loss of high quality general human capital may be damaging to the firm's capabilities, scholars have asserted that the loss of high quality firm specific human capital is likely to be even more damaging to the firm's competitive advantage and performance (Wang & Barney, 2006). Replacement of large amounts of firm specific human capital cannot, by definition, be accomplished in the external market. However, by acquiring PHC that has similar PFE, firms are likely able to build firm specificity more quickly in their inflowing professionals with efficiencies gained in the socialization, communication, and creation of informal network ties.

The loss of low quality general or firm specific PHC, conversely, grants the firm relatively higher flexibility. The vacated functions performed by lower quality professionals are easier to fill with new professionals, *ceteris paribus*, as lower quality PHC resources are likely more abundant, less expensive, and easier to identify. With the greater slack provided by the outflow of lower quality PHC, firms can conduct wider searches and hire on the basis of new knowledge (Voss et al., 2008) in order to build more diverse resource bundles and dissimilar social capital thereby expanding the network resources available to the firm. Further, with low quality PHC loss, the likely perception among remaining stakeholders is that the appropriation by the outgoing human capital exceeded its realized benefits while at the focal firm. Remaining professionals are likely to be more hesitant about the acquisition of employees who are similar to them, as it would render their own PHC less rare in the firm, thereby

bestowing them lower bargaining power (Coff, 1999). By hiring less similar PHC, remaining professionals are likely to realize a greater portion of rents (Coff, 2010; 1997; Wang et al., 2009) as their PHC is rarer and firm specific, which bestows them greater bargaining power to residual rents. Given these arguments:

Hypothesis 6a. The quality of general professional human capital outflows positively moderates the quantity of outflows-similarity of PFE inflows relationship, such that increased quality of outflow strengthens the quantity of outflow-similarity of PFE inflows positive relationship.

Hypothesis 6b. The quality of firm specific human capital outflows positively moderates the quantity of outflows-similarity of PFE inflows relationship, such that increased quality of outflow strengthens the quantity of outflow-similarity of PFE inflows positive relationship.

PHC Outflows, Bundling and PHC Replacement Similarity. Using the same logic as with hypotheses 3 and 4, the conditions of a firm's bundling strategy, specifically its leverage and geographic diversification, are expected to affect the outcomes of the outflows of PHC. In both previous hypotheses, it is argued that conditions of high leverage and high geographic diversity hinder the exchange of tacit knowledge between professionals and render resource orchestration activities less efficient as the amount of PHC outflow increases.

Circumstances of high quantity losses coupled with either high leverage or high geographic diversity produce situations in which the slack resources (particularly time and effort of the remaining professionals) of the organization are diminished. Under

these conditions, the loss of PHC is more evident to other professionals in the organization, as their activities must turn from proactive implementation of a firm's strategy to a recovery mode. For instance, a sales professional faced with the loss of a fellow sales professional in an adjacent territory would likely need to assume duties for the lost professional's territory including the orchestration of any subordinate sales and delivery team. These extra duties hinder the professional's ability to more efficiently orchestrate resources within his/her own territory to align them with the firm's strategy. Large resource losses coupled with relatively fewer remaining professionals or more dispersed professionals, therefore, are likely to spread individual professionals' resources among more activities. The resource loss in these two scenarios will likely be perceived as a drastic loss to professionals' resources and a potential crisis in the implementation of business-level strategies for which each professional is responsible.

To alleviate the disruption to strategic momentum (Amburgey & Miner, 1992), professionals may try to replace the lost resources with those that they can efficiently search for, select, and bundle with existing resources. With PHC replacement, specifically, these resources are more likely to come from existing external networks, such as those that share PFE similarity. In situations when the human capital loss is high and is exacerbated by high leverage or high geographic dispersion of professionals, the ASA model of homosocial reproduction through acquisitions of similar PFE resources is likely predictive of firm behavior.

In circumstances where the quantity of resource loss is high but the impact to capabilities is not as high because of low leverage and low geographic diversification,

the ASA model is not expected to be predictive of replacement selection. Under these conditions, the loss of PHC is likely to be absorbed more easily and the strategic momentum (Amburgey & Miner, 1992) maintained. Resource orchestration can more easily be assumed by the remaining professionals, as tacit knowledge redundancy is more likely to exist in firms with lower leverage and in geographically focused firms. Additionally, remaining professionals under these circumstances may perceive the loss of PHC as a personal resource gain – fewer professionals with redundant human capital resources creates greater scarcity of those resources within the firm, which improves the bargaining position of those professionals. As a result, these professionals, upon resource loss, may be able to appropriate more rents because of increased bargaining power (Coff, 1999).

Acquiring PHC that is the same as that remaining in the firm, therefore, is likely to be perceived less as a relief to a the loss of strategic momentum, but more as a threat to a bargaining position for the rents generated by the organization (Coff, 2002). Given greater flexibility and resource slack with low leverage and geographically focused firms, there is a greater likelihood that acquisition of PHC will be explorative (Voss et al., 2008). This implies that firms will not use external networks with that are predicated on similarity of PFE. Instead, firms are likely to select PHC with more dissimilar PFE backgrounds. Formally, this logic lends itself to:

Hypothesis 7. The leverage of the firm positively moderates the quantity of outflows-similarity of PFE inflows relationship, such that increased leverage

strengthens the quantity of outflow-similarity of PFE inflows positive relationship.

Hypothesis 8. The geographic bundling of the firm's PHC moderates the quantity of outflows-similarity of PFE inflows relationship, such that increased geographic diversity strengthens the quantity of outflow-similarity of PFE inflows positive relationship.

Similarity of PHC Outflows and PHC Replacement Similarity. Inflows of PHC with similar PFEs increase the differentiation of the firm with respect to the industry. The accumulation of these similar PHC resources can be traced back to the initial resources upon firm founding, as suggested by both RBT (Wernerfelt, 2011) and the ASA model (Schneider, 1987). Existing stocks of PHC resources can reduce the cost of acquiring other resources with which there is some synergy and efficiency gains (Wernerfelt, 2011), which is likely to be more similar PHC (Schneider et al., 1995). The path dependent accumulation of resources suggests that the more homogeneous the PFEs are within the firm, the more unique the profile of resources is likely to be vis-à-vis other firms in the broad industry (Maritan & Peteraf, 2011). Certainly, there could be rival firms with high degrees of resource similarity (Chen, 1996) or strategic groups that acquire resources through the same channels (Barney, 1986), both of which could lead to one or a few firms with similar profiles of PHC. However, with respect to the larger industry, when firms attract, select, and retain those who are most similar to the stock of human resources in their own firm (Ployhart et al., 2006; Schneider, 1987; Schneider et al., 1998), they are also locking out competitor firms from those resources in labor

markets (Ho, 2009; Markman et al., 2009). This approach differentiates that firm from the broader industry, and could also further differentiate a firm's strategic group from the rest of the industry.

Taking the ASA model to its logical extreme, an accumulation of increasingly similar resources creates scarcity in strategic factor markets while concomitantly building a resource portfolio that is increasingly dissimilar to competing firms (Dierickx & Cool, 1989). If similar PHC leaves a firm, that firm may then become less differentiated in the industry, as rival firms may hire those professionals to gain knowledge of their previous firm's routines (Aime et al., 2010). Additionally, with outflows of similar resources (provided there is enough scarcity of those resources; Barney, 1991; 1986), PHC portfolios in the remaining firm can be more easily imitated by competitors by hiring those professionals. Losing dissimilar PHC, though, will make the firm more homogeneous, while simultaneously increasing its differentiation in the industry.

The implication of the ASA model for firm differentiation is that, without negative feedback loops, firms would continue differentiating themselves from other firms by accumulating (possibly even hoarding, e.g., Ho, 2009) similar human capital to infinite regress. The extreme theoretical conclusion of the ASA model within an industry suggests that each firm has extremely little within-firm variance compared to between-firm variance within their human capital portfolios. Schneider and colleagues (1995) recognize this conclusion, and point out that while the ASA model is widely predictive of differentiation based on accumulation of resources (Sirmon et al., 2007; Dierickx &

Cool, 1989), there are circumstances in which the ASA model does not predict firm behavior, specifically acquiring behavior. Little is known or has been tested about the conditions under which the ASA model does and does not hold, though (Schneider et al., 1995). Theoretical explanations for hypotheses 6-8 address three of these possible conditions.

There are other theoretical reasons why the ASA model would not always be predictive of firm behavior. Firms tend to be isomorphic within an industry in order to maintain legitimacy and to reduce uncertainty (DiMaggio & Powell, 1983). This suggests that firms will not always attract, select, and retain similar human capital within, as doing so make firms less isomorphic (i.e., more differentiated from their competitors) and thus would decrease legitimacy and increase uncertainty. Alternatively, firms may attempt to create a strategic balance (Deepphouse, 1999) of PHC similarity, such that they are adequately differentiated in the market, but also partially isomorphic. In a sense, this addresses the tension between isomorphic and differentiating forces present in the structuring and bundling of human capital within the firm. Correct strategic balance of human capital similarity is likely unique to each firm, as they have different deployment behaviors to reflect particular firm strategies (Sirmon & Hitt, 2009) that align with various needs of the external environment (Amit & Schoemaker, 1993; Brymer et al., 2011; Sirmon et al., 2007).

The correct mix of PHC similarity is not static in the current competitive environments of developed economies (Bettis & Hitt, 1995). As more similar PHC exits in the firm, the achievement of strategic balance is likely to be called into question by

remaining firm professionals. Firms should more easily retain similar PHC than less similar PHC (Schneider, 1987), so the loss of similar PHC is probably surprising. In these instances, remaining professionals are more likely to be able to efficiently perform the tasks left vacant by the departing PHC, as the remaining professionals are more likely to have similar knowledge and skills as the exiting professionals. Further, remaining professionals are likely to have more unique knowledge and roles within the firm when PHC similar to theirs outflows, allowing them to potentially appropriate more rents (Coff, 1999) after a group of more similar human capital departs (Coff, 2002).

Losing less similar PFE resources creates greater homogeneity within the firm. The resulting trust within the firm is likely to increase because of the shared experiences, knowledge, and mental models of the remaining professionals with relatively similar PFEs (Jones & George, 1993). The outflow of less similar PHC, though, diminishes the firm's ability to maintain operations, as less similar PHC has more unique knowledge and tasks within the firm. In this scenario, and using previous arguments of acquisition and bundling efficiencies made possible through similar PFE inflows, the ASA model would hold true for the outflow of dissimilar PHC – the firm is likely to consider similarity of inflows to be of higher importance. The negative feedback loop regarding the outflow-inflow relationship and when a firm loses dissimilar PHC would help stabilize the strategic balance of a firm's PFE resource portfolio.

High quantities of outflows may outweigh these considerations and point to behavior by remaining professionals opposite that suggested by the ASA model. A loss of PHC from a similar PFE may be perceived to improve the bargaining position for rent

appropriation by remaining professionals (Coff, 1999), and thus, there are individual incentives for remaining professionals not to acquire more similar professionals. Further, as external networks are formed of people with similar PFEs (Lee & Brinton, 1996), a large loss of highly similar PHC is likely visible to a number of people within a PFE network in the industry. This loss may be interpreted as a signal (Spence, 1973) to those outside the firm but inside the network of similar PFE as one of organizational undesirability (Turban, 2001), because losing of “one of their own” could be interpreted as a sign of relative firm weakness.

The recency of such a PHC resource loss, particularly one with which they share common social identity (Humphreys & Brown, 2002), may also cause remaining professionals to focus too much attention on particular types of PFEs (Amit & Schoemaker, 1993; Simon, 1947). Particularly in the case of voluntary turnover, there may be a “jaded lover” effect, in which the recency of more similar PFEs leaving would cause a temporary attribution that those with such PFEs are not good fits and are less valuable to the organization. In the case of involuntary turnover, there is likely a recency effect to the attribution of those professionals to a particular PFE profile. This logic suggests that remaining professionals are less likely to hire human capital that has more similar PFEs, as the damage of the outflows are recent (Simon, 1947).

From an external perspective, candidates with the PFEs that are the same as out-flowing human capital are more likely to notice those flows and have information on why the exiting employees chose to leave. These reasons are likely unflattering to those who were involuntarily released, and also possibly unflattering for those that voluntarily

chose to leave. These factors are likely to soften demand in the external labor market for employment at that firm, further decreasing the likelihood that the firm would attract similar PHC. This logic also points to a strategic balancing of PHC resources by a negative feedback loop concerning the ASA model with respect to PHC similarity, especially with higher quantities of outflows.

In the case of lower quantities of PHC outflows, the strength of these arguments is largely diminished – the volume of information through PFE networks is lowered, the attribution of PFE identity in outflows is lowered, and the recency effect (because there are fewer people leaving throughout a time period) is diminished. Thus, the similarity of PHC outflows is expected to make the quantity of outflow – similarity of inflow relationship more divergent. Formally:

Hypothesis 9. The similarity of PHC outflows negatively moderates the quantity of outflows-similarity of inflows relationship, such that increased similarity of PHC outflows weakens the quantity of outflow-similarity of PFE inflows positive relationship.

Temporal Performance Effects of Similar Resource Inflows

The acquisition of PHC that is similar to the stocks of PHC that exist in the firm has been argued to be an economizing strategy, one where search, information, and integration costs are lower than the acquisition of PHC that is dissimilar. The savings from these reductions would be realized in the short term, as resources would be saved from not deploying them on the contemporaneous search, information, and selection

costs, nor on the subsequent integration costs. The saved resources are available for use in other short-term value creating activities, such as increased service/production output and greater resources deployed for sales and promotion. The acquisition of PHC with more similar PFE, therefore, is expected to be a short-term benefit to the organization's performance.

There are reasons to believe, though, that this benefit to performance will not extend to the longer-term performance of the organization. Similarity of PFE acquisition reinforces current organizational routines, cognitive structures, and decision making heuristics within the organization (Brymer et al., 2011). While there is evidence that shows that greater homogenization of PHC resources begets more rapid organizational decision-making and can allow the firm to exploit its existing resources already available (Carpenter, 2002), these similar resources are also less likely to challenge the status quo (Millikan & Martins, 1996; Priem, 1990), reinforcing path dependencies in organizational knowledge and capabilities (Kogut & Zander, 1992). Further, with similar PFE, newly acquired PHC resources will be less likely to have new knowledge that will allow for innovation (Makri et al., 2010).

The homogenizing effect of acquiring resources similar to those stocks already in the firm may lead to relational and organizational inertia (Briscoe & Tsai, 2011). The maintenance of organizational inertia leads less explorative activity (March, 1991), which has been shown to be a positive determinant of long-term firm performance by creating new products, new knowledge, and new capabilities (e.g. Voss et al., 2008) for a dynamic competitive landscape (Bettis & Hitt, 1995). Organizations that depend too

much on acquiring similar PFE resources will have less opportunity to learn, which will be harmful to performance in the longer term. These arguments lead to the final hypothesis:

Hypothesis 10. The similarity of inflows has a short-term positive influence on firm performance and a longer-term negative influence on firm performance.

CHAPTER IV

METHODS

Sample

The sample used for this study is derived from *The American Lawyer*, a periodical magazine that follows the American law industry. Beginning in 2000, the publication ranked the 200 highest revenue producing US-based law firms (referred to hereafter as the Am Law 200), which is analogous to *Fortune* magazine's rankings of the largest publically traded firms. As the Am Law 200 changes slightly from year to year, the sample may contain all firms that were a part of the Am Law 200 at any point during the sample time frame, 2000-2007 (Henderson & Bierman, 2009). The total number of firms in the sample is 206, yielding 1464 firm-year observations for the models in which the dependent variable is firm performance in the next fiscal year (i.e., T+1; hypotheses 1-4), representing 91.5 percent of the possible firm year observations. This sample size becomes incrementally lower as the future performance variables are right censored for the model testing hypothesis 10. Hypotheses 5-9 have a dependent variable which has a defined value for this measure only when there is inflow for a particular firm-year. There are 1133 firm-year observations representing 202 firms for these years.

The law industry has several benefits for testing the relationships theorized. As a professional service industry with relatively few tangible assets, the vast majority of law firms' resources are tied to the human capital of the firm (Hitt et al., 2001; 2006; Sherer,

2008; von Nordenflycht, 2010). In testing the effects of PHC flows in law firms, there are therefore fewer confounding variables that may concurrently affect firm performance, such as fluctuations in raw material costs or significant technological innovations that may disrupt the industry's structure. Law firms have a relatively simple, flat structure comprised of partners (both equity and non-equity), associates, and staff. This structural type is shared across the largest firms (Sherer & Lee, 2002). The career paths of most lawyers is relatively uniform for most partners in the largest firms – after graduating from law school, new lawyers join a firm and generally work in that firm towards promotion to partner. A portion of the lawyers achieve this promotion as an equity partner, while others are granted non-equity partner status, and still others leave the firm with the “up or out” practice in the industry (Sherer, 2008; Sherer & Lee, 2002). This typical “tracked” approach for careers creates a relatively high number of partners at any firm with a high degree of firm specificity. Partner exits, in these cases, are likely to be more impactful to a firm's competitive advantage (Wang & Barney, 2006), and are more likely to be voluntary events (from the partners' perspective; Bierman & Gely, 2003). Thus, the flows of professional capital for partners in law firms are more likely salient to firm performance (Dess & Shaw, 2001; Hancock et al., in press).

Incisive Legal Intelligence (ILI) has complemented the firm-level data from *The American Lawyer* with records of the movement of individual partners to and from the Am Law 200 firms. Data on each movement include the firm from which the partner left, the firm to which the partner went, the month and year of the movement, and the practice area of the partner. During the years 2000-2007, there were 18,554 identified

lateral partner movement events in the sample of law firms. These not only included partners who went from one firm in the sample to another firm in the sample, but also those who both came from and went to other organizations (non-Am Law 200 law firms, governmental agencies, non-law based corporations, and non-profit agencies).

To complement these data, the Martindale-Hubble directory database contains background information of lawyers licensed to practice in the US, including his/her title, law school, undergraduate institution, distinctions earned, areas of practice, and years of graduation. There were over 6.5 million partner records of associated with the sample law firms. After removing duplicate entries (the average partner had 23 entries, up to a maximum of 430 entries) and non-law degree entries, there were 84,093 unique partner educational entries to comprise the stocks of the sample firms. This substantial directory of practicing lawyers was matched with the ILI partner movement dataset, producing 12,825 matches, which is 69.1 percent of the total number of partner movements. The Martindale-Hubble database is not comprehensive, as it contains approximately 53 percent of partners reported at the firm level of the Am Law 200 database (factoring in natural retirement rates and extrapolated movement rates to and from industry and government organizations). The limitations of the data do not allow for a complete matching of the data sets, though given the 53 percent of the total population of Am Law 200 firms in 2000-2007 reported in Martindale-Hubble, 69.1 percent is a greater percentage of matching than would normally be expected (i.e., greater than the 53percent representation of the total population of AmLaw200 partners). Such representation of the

flow attributes provides improved measurement validity to these central constructs in the study.

Dependent Variables

Firm performance. Following Hitt and colleagues (2001; 2006), firm performance is measured as the ratio of net income to total firm revenue, i.e. return on sales. This measure inherently controls for firm size.

PHC inflow similarity. The similarity of PFE in PHC flows is measured by calculating the Euclidean distance of the collective PFEs between the static PHC of the firm and the inflows of PHC. The Euclidean distance is calculated by:

$$d(p, q) = \sqrt{(p_1 - q_1)^2 + (p_2 - q_2)^2 + \dots + (p_i - q_i)^2 + \dots + (p_n - q_n)^2}.$$

, where d is the distance (inverse of similarity) between the two groups, the p and q variables represent the percentage of people in the group that graduated from a particular law school. There is one (p-q) set for each law school represented by both the static firm individuals and the individuals in the flows, and this is calculated for each year and firm for both inflows (and outflows as a control variable).

To support the causal inference for the effect of flows of human capital on firm performance, the dependent variables are measured in the year after the flows occur for hypotheses 1-9 and every year up to the fifth future year for hypothesis 10.

Independent Variables

Quantity of PHC flows. Partners in law firms are in professional managerial roles, typically responsible for a number of lawyer associates in a given practice area (Sherer, 1995). The flows of PHC are measured as the natural log transformation of the total number of partners exiting (out-flows) a firm in a given year.

Quality of PHC flows (general and firm specific human capital). PHC quality is measured in two ways to reflect the constructs of general and firm specific human capital. Similar to Hitt and colleagues (2001; 2006), the partner's law school quality according to the *US News and World Report* is averaged from 1987-2008, and the ranking is reverse-coded. This measure is noted as one of the more valid measures of general human capital (Armstrong & Shimizu, 2007), as it reflects both the ability necessary for individuals to gain admission into those programs as well as the quality of the knowledge instilled in the graduates of those programs. The outflow of PHC is a firm-level construct (Ployhart & Moliterno, 2011), and thus the mean of general human capital for all individuals leaving in a given year per firm is calculated as the outflow of general human capital.

Neither the Martindale-Hubble nor ILI databases have tenure information for the partners. Instead, a proxy for outflow firm specificity is the number of partners that have made multiple moves, i.e. they have switched from a prior firm to the focal firm and thereafter exited the focal firm. Higher numbers of multiple movers indicate lower firm specificity, *ceteris parabus*, as those lawyers have not spent their law career entirely at the focal firm and thus have lower firm specificity. Further, job switching is more likely

early than late in a career (Holtom et al., 2008), also supporting the assertion that a higher portion of multiple movers in outflows represents lower firm specificity.

Leverage is measured by the number of lawyers divided by total firm partners, per firm per year (Hitt et al., 2001; Sherer, 1995).

Geographic diversification is measured with the total number of branches (each in a different geographic location) for the firm. This measure represents the bundling of partners, as lower number of branches means greater co-location, which facilitates the exchange of tacit knowledge among peers. In the law firm setting, this is particularly important as partners deal with laws specific to their municipality, county, state and nation.

Control Variables

Service diversification strategy. This is a Herfindahl-type index measuring the distributions of the stocks of partners in each of the firms' major groups of practice areas: antitrust, bankruptcy, regulation, corporate securities, general business, intellectual property, white collar SEC litigation, general litigation, trusts and estates, intellectual property, labor, real estate, and other (Sherer, 1995; Sherer & Lee, 2002). A lower score indicates greater diversification.

Somaya and colleagues (2008) demonstrated that the type of new firm (i.e., rivalrous or non-rivalrous) can have firm performance effects as employees exit. The *non-rival destination* variable is the percentage of PHC outflows that go to an industry outside of legal services (i.e. corporate or business) or government organization.

Prior firm performance (as a control variable) is the one year lagged profits per partner in the firm, a common indication of performance in law firms (Sherer 2008, 1995). This measure is employed in place of the lagged return-on-sales measure to minimize the effects of collinearity and autocorrelation.

Firm age is the number of years since the firm was founded. As Schneider and colleagues (Schneider et al., 1995) believed that younger firms may adhere to the ASA model to a greater extent than older firms, and Sherer (2012) cites an expectation of older firms not acquiring as many external professionals, firm age will be used as a control.

Percentage of M&A partners is the percent of outflow partners that came into the focal firm via acquisition during the 2000-2007 timeframe. The likelihood of exit increases for the acquired firms' employees after the merger (Holtom et al., 2008). Also, while they do have a degree of new firm specificity (e.g. relationships with other partners from the acquired firm), they are likely not to have the same breadth of firm specific human capital as the legacy firm partners.

Frequent acquirer is a dummy variable indicating whether the firm acquired two or more firms in the sample window. Firms differ on their strategies of acquiring PHC, and two or greater acquisitions in an 8-year time period indicates a significant M&A strategy (versus a recruiting and promotion strategy) to acquiring PHC. 28.8 percent of the firms fell into this category.

PHC outflow similarity is measured exactly in the same manner as inflow similarity, but with the exiting partners.

General human capital of firm stocks. Hitt and colleagues (2001) found the stocks of the firm's human capital to be a moderator of relationships in which law firm performance was the dependent variable. Further, several researchers have found that organizations that have members with elite schooling pedigrees tend to be more insular in their hiring and promoting practices than other organizations (Ho, 2009; Useem, 1979; Useem & Karabel, 1986). The measure is calculated the similarly to the analogous flows variable – the mean score of the reverse scored law school ranking from 1987-2008.

Year effects are controlled for using year dummy variables. These year dummy variables minimize the problems of heteroskedasticity and autocorrelation due to temporal effects when employing a panel data least-squares regression approach (Hitt et al., 2001; Sayrs, 1989).

Analytical Approach

In examining the temporal structure of PHC flows with a relatively stable set of firms, the data are panelized and time series panel data estimation approaches are employed. To control for endogeneity, both instrumental variable and Heckman models are used following the recommendations of Bascle (2008) and Hamilton and Nickerson (2003).

For Hypotheses 1-4 and 10, a two-stage least squares (2SLS) approach was determined to be appropriate because of the endogeneity of the primary independent variable, the quantity of PHC outflow. Three instrumental variables were determined to

be both relevant and exogenous, as demonstrated by the first stage *F*-statistic test ($p < 0.01$) and the Sargan test ($p > 0.10$), respectively, as recommended by Bascle (2008). In other words, these variables are related (and are relevant) to the endogenous independent variable, as indicated by the significant *F*-statistic test which tests for the predictive power of the instrumental variables on the predictor variable. These instrumental variables provide a proxy for a latent variable (Bascle, 2008), and account for measurement error without being predictive of the dependent variable, as indicated by the non-significant Sargan test. The instruments chosen were the *number of total partners* in the law firm for a particular year, the *quantity of inflow* for the year contemporaneous to the outflow year, and the *difference of maximum-minimum branch partner count*, which is the difference between the firm's branch with the highest number of partners and branch with the lowest number. STATA's XTIVREG2 was utilized (Baum, Schaffer, & Stillman, 2007). Standard errors robust to both heteroskedasticity and serial correlation are employed. A Hausman-specification test determined a fixed-effects model is the most appropriate for use with these data. Though fixed-effects modeling drops from the estimation measures that do not vary over the time frame, the methodology accounts for latent variable heterogeneity between firms. The inclusion of these control variables in a supplemental analysis using a random-effects model yielded substantively similar results. Therefore, it was determined that the fixed-effects model would be the most conservative and valid choice for these hypotheses.

The dependent variable for Hypotheses 5-9, PHC inflow similarity, is a censored variable with and lower to upper limit value ranging from -1 (least similar) to 0 (most

similar). In panel data modeling with censored dependent variable, Tobit regression is the appropriate estimator (STATA command XTTOBIT; STATA Press, 2005). Because the PHC inflow similarity score is undefined for years when there is no inflow (i.e., zero partners are hired from outside the firm) and the firm chooses to hire or not in any given year, there is a self-selection bias for these models (as indicated by a LR independent equations test). To account for this bias, a Heckman two-stage procedure is used (Hamilton & Nickerson, 2003). A time-series probit first stage estimates the inverse Mills ratio for the dummy variable of whether or not a particular observation hires nobody (0) or at least one (1) partner from outside. The variables used for the first stage were the *number of total partners*, *service diversification*, and the *average AmLaw200 starting associate annual salary*, all of which were statistically significant predictors of the firm's likelihood of hiring in a given year ($p < 0.05$). The fitted values for the inverse are included in the second stage time series Tobit estimator. This ratio is also included for hypothesis 10, when PHC inflow similarity is the primary independent variable – its exclusion also presents a similar selection bias that is similarly corrected with the Heckman two-stage approach.

CHAPTER V

RESULTS

Table A1 presents the descriptive statistics – the means, standard deviations, and the correlations – for the dependent, independent, and control variables.

Similar to Hitt and colleagues (2001), variance inflation factor (VIF) scores were identified using ordinary least squares regression on the same variables to check for multicollinearity in the independent and control variables. All individual VIF scores were below the threshold of 10, and the average VIF scores were 1.62 and 1.77 in the two base direct effect models, for firm performance and inflow similarity, respectively. These figures suggest that multicollinearity problems were not an issue of concern in the analyses. Additionally, variables that constitute interaction terms were centered about their means to avoid any non-essential multicollinearity.

Table A2 presents the results from the testing of Hypotheses 1-4. Hypothesis 1 states that there is a negative relationship between the quantity of outflow of PHC and firm performance. The negative coefficient of -0.051 ($p < 0.001$) can be interpreted with different levels of outflow (see the Discussion, Chapter VI for this information). Hypothesis 1's negative effect for outflow, therefore, receives support from these results.

Hypothesis 2a and 2b state that the quality of general and firm specific PHC would have negative moderating effects on the outflow-performance relationship. The coefficient for the general PHC – outflow quantity in Model 3a is -0.000041, but statistically insignificant ($p > 0.10$). Hypothesis 2a is not supported. In Model 3b, the firm specific PHC – outflow quantity term coefficient is 0.0144 (reverse coded; $p < 0.05$). Figure B1 illustrates the moderation. When there are low amounts of outflow, the effect of losing PHC with higher firm specificity is less detrimental than with greater amounts of outflow, with which losing firm specific PHC plays an increasingly harmful role in firm performance. Thus, these results provide support for Hypothesis 2b.

Hypotheses 3 and 4 considers the PHC bundling dimensions of leverage and geographic diversification and their moderating effects on the outflow quantity-firm performance relationship. Leverage is hypothesized to have a negative moderating relationship on the outflow-firm performance relationship. The coefficient for the leverage moderation is 0.00143, but not statistically significant ($p > 0.10$). Therefore, Hypothesis 3 is not supported. The moderation coefficient for geographic diversification – outflow quantity is marginally statistically significant, with a coefficient of -0.0009 ($p < 0.10$). Figure B2 illustrates that the negative slope of the outflow-performance relationship is far steeper with greater geographic diversification, which is consistent with the hypothesized direction of the moderation. Thus, even though the interaction effect is of only marginal statistical significance, the graph clearly depicts the relationship hypothesized providing marginal support for Hypothesis 4.

Hypothesis 5 states that the greater quantities of outflows are associated with higher similarity of subsequent inflows. The coefficient for this relationship in the direct effects model (Model 6) is 0.01656 ($p < 0.05$). These results provide support for Hypothesis 5.

Hypotheses 6a and 6b state that general and firm specific PHC have positive moderation effects on the outflow quantity-inflow similarity relationship. The coefficient for the moderation of general PHC is 0.00026, but statistically insignificant ($p > 0.10$). Hypothesis 6a is not supported. The firm specific PHC moderation of the same relationship has a coefficient of -0.000883 (the variable is reverse coded) in Model 8b, but is also statistically insignificant ($p > 0.10$). Therefore, Hypothesis 6b receives no support.

The PHC bundling dimensions of leverage and geographic diversification are also hypothesized to moderate the outflow quantity-inflow similarity relationship. Hypothesis 7 does not receive support, as the coefficient for the leverage moderation in Model 9 is -0.000687 and statistically insignificant ($p > 0.10$). Hypothesis 8 is tested in Model 10, where the geographic diversification-outflow quantity interaction variable is -0.000807 but statistically insignificant ($p > 0.10$). Therefore, Hypothesis 8 also does not receive support.

Hypothesis 9 states that the similarity of PHC outflow negatively moderates the outflow quantity-inflow similarity relationship. Model 11 shows this interaction coefficient to be -0.0222 and statistically insignificant ($p > 0.10$), so Hypothesis 9 is not supported.

Hypothesis 10 suggests that the inflow similarity-firm performance relationship changes over time, such that the relationship is positive in the short term and becomes negative in the longer term. Models 12-16 test this temporal effect of inflow similarity over time, along with the direct effects of the other independent variables and controls. Through five years (the year contemporaneous with the inflow to four years after the inflow), the coefficients are -0.0002195, -0.0001943, 0.0114914, 0.0069464, and -0.0019431 respectively. In the second year after replacement of PHC, there is a marginally statistically significant positive relationship between inflow similarity and firm performance, which may be deemed a short-term positive effect on performance. Thus, Hypothesis 10 is partially supported.

In the following chapter, the implications of these results on theory and practice are discussed.

CHAPTER VI

SUMMARY

Flows of human capital have long been recognized by both strategy and human resource management scholars as a critical issue affecting firm performance (Barney & Wright, 1997; Hancock et al., in press; Holtom et al., 2008). Though most studies have shown that a high quantity of human capital outflow is detrimental to organizational performance, there is little evidence to suggest other attributes of the firm or flows play a significant role in the relationship. There is a clear need to theoretically explore these dimensions in addition to studying the temporal structure of the outflow effects (Hancock et al., in press) and how firms respond to outflows of PHC. This work addresses these important yet relatively unaddressed gaps in our understanding.

Analyzing a sample of professionals (i.e., partners in law firms), the results of this study provide support for a number of theoretical assertions outlined herein. There is robust support for the negative effect that the quantity of outflows has on firm performance, which corroborates many of the findings in the major stream of research on human capital turnover (Hancock et al., in press). Additionally, the results suggest the quantity of these partner exits is positively associated with firms hiring resources similar to those stocks already in the firm. Two of the contextual variables for proposed flow or firm attributes have moderating effects on the outflow-firm performance relationship. And while the hypothesis for temporal effects of this similarity of inflows receives only

marginal support, I suggest that there may be other variables that warrant additional investigation in predicting when firms acquire similar resources and how such acquisition may impact firm outcomes over time.

For this discussion, I consider the theoretical implications of this research related to the two primary foci of this study – 1) **Firm performance and PHC flows** - outcomes resulting from outflows of professional human capital, the flow and firm bundling variables proposed as moderators to this relationship, and the temporal structure of PHC flows and firm performance, 2) **Replacing lost PHC with similar inflows**- the acquisition of similar human capital resulting from outflows of PHC and the flow and firm bundling variables proposed to moderate this relationship. The study's results provide contributions to RBT/resource orchestration theory, to human capital theory, and to the literature on turnover, the ASA model and strategic human resource management. This work extends our practical understanding of turnover in professional service firms, which make up an increasingly important segment of modern economies (Ford & Bowen, 2008). Practical implications for managers, the limitations of this work, and future research directions are then discussed to gain a richer understanding of the implications of this research.

Firm Performance and PHC Flows

The basis of this work considers the oft studied outflow quantity – firm performance relationship. As with many firm-level studies that consider human capital and human resource management, this study is largely framed with RBT (Wright et al.,

2001). With this grounding in previous work, there are several extensions made with this study.

First, this study considers professional human capital, which tends to be knowledge intensive and part of the core strategic work force (Lepak & Snell, 1999). The sample is partners in law firms, an example of a professional service organization (Hitt et al., 2001; von Nordenflycht, 2010). These professionals are also vested in the organization not only as wage earners but also as owners, making partner-owned professional service firms (e.g., law firms, accounting firms, and consulting firms) a rather unique organizational form (Pennings & Wezel, 2007). While there have been a host of studies considering the performance outcomes of total firm turnover and top management team turnover (Hancock et al., in press), few studies have considered professionals specifically, and still fewer have considered professionals that have middle management responsibilities, as do partners in law firms. This is a significant shortcoming, as the leading world economies have a burgeoning professional, knowledge intensive workforce that drives their gross domestic product (Drucker, 2003). Further, strategy implementation depends heavily on middle management's support (Wooldridge & Floyd, 1990), so having a dearth of middle management turnover studies represents a potential void in understanding the reasons behind middle management outflows' detrimental effects.

There is robust support for the negative effect of the quantity of outflow's short-term impact on firm performance, witnessed in Models 2-5 and 12. The effect is not trivial. Two partners leaving is associated with a 3.5 percent decrease in return on sales;

five partners leaving with a 8.2 percent decrease; fifteen partners leaving with a 13.8 percent decrease. Given that there is annual revenue in excess of \$2B for firms in this sample, these decreases are substantial. The return on sales measure may also be understating the performance effect on the firm, as the loss of a partner not only represents a loss of revenue but also a roughly proportionate recuperation of labor costs. Exploring more nuanced and proximal effects of this turnover, such as client loss, client satisfaction, or remaining employee intent to leave could yield interesting results (Hancock et al., in press).

Human capital theory and RBT suggest that firm performance will be negatively affected when the quality of PHC outflows is high. There is support for firm specific PHC negatively moderating quantity outflow - performance relationship (see Figure B1), as well as a marginal direct effect three years after the loss of firm specific PHC (i.e., two years after its subsequent replacement; see Table A4). Scholars have argued that firm specificity in the *stocks* of human capital contribute to the achievement of competitive advantage (Ployhart et al., 2009; Wang & Barney, 2006; Wang et al., 2009). These findings extend this argument to include flows of firm specific human capital, as the outflow of PHC with higher firm specificity has negative consequences on performance. Firm routines and capabilities that require tacit knowledge of their professionals are likely the most affected by outflows. This finding suggests that the long-standing but largely abandoned (Blair & Kochan, 2000) conventional U.S. practice (which is to greater or lesser extents still convention in other modern economies, such as Japan and Western Europe; Kochan & Litwin, 2011) of trying to retain human capital

through an entire career, or at least decades, has a positive impact on firm performance. The economic paradigms (Ferraro, Pfeffer & Sutton, 2005) dominant in business practices since the 1970s emphasize short-term performance and the benefits of layoffs over the longer-term benefits of building and retaining firm specific human capital (Blair & Kochan, 2000). These findings corroborate other studies that have shown the delayed damage that the outflows of human capital can create for a firm (e.g., Nixon et al., 2004). This study suggests that one of the driving forces behind poor subsequent performance after outflows of resources is the erosion of firm specific assets, and that this damage has not only an immediate impact but also one that may take years from which to recover.

Interestingly, general PHC did not have the same deleterious moderating effect on the quantity of outflows – performance relationship. RBT scholars have questioned general PHC's ability to create competitive advantage on its own, explaining that any additional benefit from the higher human capital would be priced proportionately higher in the labor market, thus diminishing any ability of the firm to realize residual rents created by that resource (Wang & Barney, 2006). Perhaps, in some professional service firms, where the pedigrees of constituent professionals are often an important selling point to clients (e.g., Ho, 2009), the market is overpricing their value. In others firms, the value of the general PHC may be underpriced, potentially leading to the finding of no significant direct or moderating effects of general PHC outflows on performance. Further, some scholars have found that general human capital, particularly in the form of general mental ability, can have diminishing performance returns (Gottfredson, 1997).

Given a certain threshold of mental ability (such as admittance to any law school), experience and practice in a particular functional area plays a much more important role than general mental ability for individual performance (Ericsson et al., 2007). Any substantive differences in general mental ability are likely muted as partners in law firms gain functional expertise and experience, which is another possible explanation for the lack of significant findings for this key characteristic of outflows.

Resource-based theory has maintained that the manner in which managers bundle firm resources is as critical for creating competitive advantages as the attributes of the resources themselves (Barney, 1991; Dierickx & Cool, 1989; Sirmon et al., 2007). Extending this argument, this dissertation asserts that bundling also is critical when firms lose control over some resources for the potential of the resource stocks that remain. It is suggested in Chapter III that bundling redundancy, or having depth of redundant resources within particular bundles, would soften the harmful effects of resource loss. The testing of this model focuses on two important ways professional service firms bundle their PHC: leverage and geographic diversification. (Service diversification is the third of the three primary manners in which PHC can be bundled at the firm level and it is a control variable in this study.) Bundling redundancy appears to be valuable for geographic diversification, but not for leverage. Geographically diverse firms performed worse as the quantity of outflows increased. This suggests that having co-located human capital can ameliorate the damaging effects of PHC outflows because tacit knowledge of ongoing capabilities can be more easily shared. Thus, this work extends RBT, and specifically resource orchestration practices, to not only include the importance of

bundling to the stocks of firm resources but to also guard against the harmful effects of resource loss due to firm outflows. This evidence suggests building depth of redundant PHC resources by bundling more partners in the same locations provides a greater firm ability to recover from resource loss. With bundling redundancy, remaining partners can more effectively manage the lost partners' accounts, subordinates, and other organizational tasks.

Such redundancy may be more important in professional service firms, where most of the organizational resource base is tacit knowledge, which cannot be easily replicated or explicated after the outflow of professionals. Theoretically, this work could be extended to better understand how bundling redundancy is achieved in more dynamic environments, and the conditions under which bundling redundancy may be less optimal. For managers, this work underlines the importance of cross-training employees to know the tasks that their co-workers manage, as well as continuously planning for succession in all core work force roles. Movement of professionals across firms is a near ubiquitous reality in advanced economies (Cappelli, 2008), so managers should be diligent in preparing redundant PHC to substitute for losses as they occur.

Replacing Lost PHC with Similar Inflows

Upon the loss of resources, the bundles remaining in the firm may be compromised in their effectiveness for executing routines, maintaining capabilities, and providing advantage over rivals. Firms must replace the resources to minimize the impact of these losses and to grow. Despite the importance of this replacement, little

work in RBT has considered the ways in which firms replace lost resources by acquiring new, external resources (Wernerfelt, 2011).

The ASA model posits that firms, as they continuously evolve, tend to become increasingly homogeneous with respect to their human capital resources (Ployhart et al., 2006; Schneider et al., 1998; Schneider, 1987). Specifically, the ASA model suggests that replacement resources will be similar to the stocks contemporaneously in the firm. However, no known work has been done on the contingencies regarding when firms may or may not acquire more similar resources – a limitation to the theory despite a call for its reconciliation over fifteen years ago (Schneider et al., 1995).

This work addresses both of these important limitations to the RBT and ASA research streams. By integrating the ASA model with RBT in the context of the replacement of lost human capital, the important gap of how firms recover from critical resource loss is addressed. The integration of these two theories in this work centered on the idea that firms would acquire more similar PHC after an outflow of PHC when that outflow represented a greater threat to the firm's maintenance of their capabilities and routines. Greater similarity, particularly in PHC, reduces search, information, selection, and integration costs, serving as a tactic to overcome the short-term detrimental effects of recent losses.

There is strong support for this phenomenon with respect to Hypothesis 5, which stated that greater quantities of outflows would engender greater subsequent similarity in inflows. For every 10 partners that exit the organization, the subsequent inflow similarity is increased by 16.56 percent, as estimated by the direct effect hierarchical model

(Model 7). This direct effect is also robust in all of the moderation hypotheses that followed (Models 8a-11). The implications of this finding are significant for the RBT, resource orchestration, ASA model, and strategic human resource literature streams. They suggest that the propensity to acquire more similar resources is stronger when firms experience greater losses of prior resource stocks. As theorized in Chapter III, greater homogeneity of PHC, particularly in professional service firms, may be a source of competitive advantage. Zardkoohi and colleagues (2011) asserted that the similarity of professional formative experiences, specifically law schools attended, can lead to more shared mental models and create cognitive efficiencies. Efficiencies based on these complex social and cognitive structures are difficult to imitate (Barney, 1991), and may serve as a source of competitive advantage, provided that firms can continue to attract similar external PHC from strategic factor markets (Barney, 1986; Markman et al., 2009).

Though the results support the theory for the quantities of outflow – similarity of inflow relationship, none of the moderators for the relationship (H6a-H8) are found to be statistically significant. These findings suggest that while the strain caused by high quantities of outflow does predict the economizing action of acquiring similar PFE, the other potentially straining circumstances of high quality PHC, high leverage, and high geographic diversity do not moderate the relationship. In other words, the quantity of outflows does not function interactively with the quality of PHC, leverage, or geographic diversification to predict the similarity of PFE inflow.

However, there are several direct effects of the independent and control variables that provide interesting and potentially important implications for the similarity of inflows. The direct effect of geographic diversification is strongly positive, suggesting that inflow PFE similarity is higher with greater diversification across cities, states, and countries. One plausible explanation of this outcome is that geographic diversification creates control complications for firm management and leadership, and the hiring of PHC with similar PFE allows for more effective communications and cognitive efficiencies in the face of the complexities of managing across space and institutional environments (particularly for the law field). Service diversification, similar to geographic diversification, is a predictor of inflow similarity. Like geographic diversification, this effect is potentially explained by the management of the firm trying to create greater homogeneity in one dimension when faced with higher heterogeneity in another, as too much diversity across many dimensions can lead to problems of control (Hitt et al., 2009).

Leverage has a direct negative effect on inflow similarity. A possible explanation is that higher leverage firms may engender (or be a function of) greater territorialism among partners for business in a particular geographic and/or service area. Similarity of inflowing partners could threaten the appropriation of value for incumbent partners (c.f. Briscoe & Tsai, 2011), particularly under the common practice of law firm in which partners' compensation is almost exclusively tied to the amount of business individual partners personally develop (Bierman & Gely, 2003; Sherer, 2008). Similarity of inflows

reduces incumbent partners' uniqueness within the firm, and thus, motivates the hiring of more heterogeneous human capital.

Higher firm performance is also robustly predictive of inflow similarity. This is a surprising finding, in light of the results suggesting that firms hire more similar PHC when there is greater potential financial strain due to higher outflows of PHC. Perhaps, firms that hire more similar PHC perform better because of an endogenous factor that recognizes building homogeneous resource stocks can be a source of capability enrichment and competitive advantage realization. While the results suggest that creating homogeneous stocks may be advantageous for law firms in the sample timeframe, variation in competitive rivalry and industry dynamism in other contexts may dictate that heterogeneous stocks beget improved firm performance. The contingencies around building homogeneity versus heterogeneity in human capital stocks are rich areas for future research.

The dynamics and temporal structure of PHC flows still leave many questions unanswered. The statistically insignificant results for Hypothesis 9 indicate that the acquisition of similar PFE resources is likely more complex than a reaction to the similarities of the previous year's outflows. Instead, there could be other stable firm characteristics or untested characteristics of the previous year's outflows that determine inflow similarity. Additionally, acquiring similar PFE is only marginally statistically significant as a predictor of firm performance, and that is only two years after the inflow (see Model 14). Other years of firm performance were statistically insignificant, which taken together is fairly weak evidence that inflow similarity has either the economizing

or harmful inertia impacts of homogeneity that are theorized. The drivers behind and consequences of acquiring similar PFE are still largely unknown, despite the study's contributions that consider a number of variables and one outcome (firm performance). Further research could consider other firm-level, group-level, and individual-level predictors of homosocial reproduction in firms over time, along with a more diverse set of outcomes for such actions.

The practical implications of these inflow similarity predictors are unclear. Though there is some evidence that the acquisition of more similar resources is an economizing strategy, it may be a necessary but insufficient condition for realizing a competitive advantage. Investigating the sources of complimentary conditions for realizing competitive advantage given more (or less) homogenizing actions warrants further investigation.

Limitations

As with any study, this dissertation has limitations that should be considered in order to gain greater insight into the applicability and generalizability of this research. The sample is from a single industry and composed of firms with headquarters in a single country. Further, the primary variables, outflows and inflows of human capital, are comprised of only one type of human capital (professional partners). While this focus of sampling and of PHC eliminates many confounding exogenous factors and is beneficial to the internal validity of the results, the generalizability of the study to other industries, other countries, and other types of human capital flows may be called into

question. Professional service firms have a number of similar characteristics (von Nordenflycht, 2010), so it is likely that these findings are more generalizable to consulting firms, accounting firms, software firms, healthcare organizations, and so forth. Future research should consider the degree to which these findings can be applied to other industries, including other professional service industries and industrial firms. Future research should also consider the degree to which these findings can also be generalized to other countries and to other types of human capital, such as executives, middle managers, entry-level employees, and contract employees.

The study is also subject to coarse-grained classifications of certain variables that limit their explanatory power. One classification is the time of the flows – it is measured on an annual basis. Firms may react much more quickly to outflows, perhaps in the subsequent month or two, with replacement PHC. With annual temporal sectioning, only a small portion of these quicker reactions would be captured by the temporal structure of this study. While the temporal structure examined here is rather conservative (using subsequent years), it likely diminishes the ability to capture the true impacts of and reactions to flows.

Another limitation is the measurement of certain firm-level variables, such as some stock variables, that were unable to be calculated on a dynamic basis (i.e., there is one measure per firm of service diversification over the study's eight years, despite a natural fluctuation that would change slightly on an annual basis). This is problematic methodologically, as these constant variables could not be included in fixed effects models (Models 1-6, 12-16). Thus it limited the explanatory power of the variable

because the changes (however incrementally) over time. Improvements on the specificity of these variables were not captured in this study.

Lastly, scholars have noted the importance of the motivation of resource flows, both in the case of employees (in)voluntarily leaving the organization (Holtom et al., 2008), and in the case of the intentional deletion of firm resources (Sirmon et al., 2007). The limitations of the data do not allow us to know the reasons why partners choose to join other organizations, or why firms decide to acquire new partners. Future studies may consider these motivations as important contextual variables that are likely to affect the firm-level performance outcomes.

Contributions

To date, there is little research concerning how resource loss affects firm performance, how it affects subsequent replacement actions, and how those actions can help a firm to recover from the loss. This research has addressed these three broad topics, and made several contributions to our theoretical understanding. It has extended the application of RBT by detailing the performance impacts for loss of particular resource attributes, by demonstrating that firms perform better with resource loss when there is certain types of bundling redundancy in the resource portfolio and demonstrating circumstances under which managers acquire resources similar to those in firm stocks. These contributions are particularly salient to the emergent micro-foundational perspective of competitive advantage (Barney et al., 2011; Campbell et al., 2012; Coff & Kryscynski, 2011; Felin & Hesterly, 2007). Additionally, this study contributes to the

literature on the strategic management of human capital (the ASA model, strategic HR, and human capital literatures) by providing a basis for understanding the factors which may cause a firm to adhere (or not) to homosocial reproduction (Schneider et al., 1995), specifically through the lens of organizational strain. A unique and relatively unstudied context is also explored, professionals in service firms, extending our knowledge of the turnover-firm performance relationship to this increasingly important group.

This work also uncovered some surprising results for variables not included in the theoretically-based hypotheses. Given the little we know about the supporting contexts of the ASA model, the dynamics of resource loss and replacement over time, and the firm and flow attributes that may determine the temporal impact of turnover, there are many ripe areas for future inquiry that could spring from the theory and results presented in this dissertation.

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APPENDIX A

Table A1 – Means, Standard Deviations, and Correlations of Dependent, Independent, and Control Variables

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Return on Sales	0.362	0.085	1.00														
2 Inflow Similarity	-0.436	0.227	-0.16	1.00													
3 Prior Performance (PPP in t-1)	816807	558629	0.35	-0.05	1.00												
4 Stock General Human Capital	66.68	11.67	0.28	-0.08	0.43	1.00											
5 Firm Age	87.96	40.78	-0.08	0.03	0.03	0.07	1.00										
6 Service Diversification (rc)	0.215	0.170	0.19	-0.18	0.39	0.11	0.04	1.00									
7 Frequent Acquirer	0.288	0.453	-0.23	0.18	-0.23	-0.24	0.04	-0.15	1.00								
8 Outflow Similarity (rc)	0.505	0.174	-0.11	-0.02	-0.08	-0.02	0.01	-0.07	-0.12	1.00							
9 Outflow Percent Previous Acquisition	0.038	0.174	0.04	0.04	-0.08	0.02	0.01	0.00	-0.02	0.02	1.00						
10 Outflow Percent Non-Rivalrous Destination	0.096	0.196	0.14	-0.18	0.06	0.10	-0.05	0.12	-0.09	0.02	-0.07	1.00					
11 Outflow Quantity	1.53	1.01	-0.28	0.27	-0.03	-0.10	0.12	-0.17	0.20	0.03	0.16	-0.61	1.00				
12 Outflow General Human Capital	65.19	21.85	0.06	0.01	0.12	0.36	0.00	0.02	-0.08	0.01	0.05	0.10	-0.08	1.00			
13 Outflow Firm Specific Human Capital (rc)	0.530	1.665	-0.21	0.14	0.02	-0.08	0.02	-0.13	0.17	-0.05	-0.03	-0.32	0.50	-0.07	1.00		
14 Firm Leverage	2.58	0.83	0.11	-0.04	0.59	0.29	0.03	0.36	-0.22	-0.04	-0.01	0.02	-0.02	0.14	-0.05	1.00	
15 Geographic Diversification	9.72	8.50	-0.169	0.271	0.01	-0.433	0.009	0.061	0.202	-0.104	-0.057	-0.201	0.332	-0.157	0.251	0.205	1.00

(rc)=reverse coded

Table A2 – Firm Performance after Outflow Models (2SLS xtivreg2 model, robust to heteroskedasticity and autocorrelation)

Return on Sales is the Dependent Variable (T+1)

	Model 1	Model 2	Model 3a	Model 3b	Model 4	Model 5
Prior Performance	9.47E-09 +	1.14E-08	1.19E-08	1.18E-08 +	1.09E-08	1.26E-08
Firm Age	-0.001549 *	0.0023381	0.0023023	0.001119	0.0022965	0.002084
Outflow Similarity (rc)	0.0023109	-0.0799948 **	-0.0801841 **	-0.0739031 **	-0.0790655 *	-0.082286 *
Outflow Percent Previous Acquisition	-0.001474	0.0279775	0.027754	0.0288998	0.0278118	0.0266023
Outflow Percent Non-Rivalrous Destination	-0.002157	0.0372714 *	0.0374119 *	0.0325135 *	0.0369377 *	0.0360709 *
Outflow Quantity	H1	-0.050625 **	-0.050455 **	-0.0502996 **	-0.0499617 **	-0.051859 **
Outflow General Human Capital (GHC)		7.17E-07	-0.0000409	0.0000369	-0.00000292	-2.14E-05
Outflow Firm Specific Human Capital (rc) (FSHC)		0.0046876 *	0.0046608 *	0.0144057 *	0.0046694 *	0.0052651 *
Leverage		-0.0259329 ***	-0.0260031 ***	-0.0260056 ***	-0.0245083 ***	-0.025615 ***
Geographic Diversification (GEOD)		-0.0003136	-0.0003672	-0.0005751	-0.0003096	-0.000202
Outflow Quantity x GHC	H2a		-0.0000967			
Outflow Quantity x FSHC (rc)	H2b			-0.0053545 *		
Outflow Quantity x Leverage	H3				0.0014275	
Outflow Quantity x GEOD	H4					-0.000898 +
F-test	11.04	5.77	5.45	5.76	5.71	5.33
Sample size	1464	1464	1464	1464	1464	1464
Firms	206	206	206	206	206	206

Two stage least-squares panel model (xtivreg2),
fixed effects by group (firm).
(rc) = reverse coded

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

Year dummies included in the model but omitted here for space reasons.

Table A3 – Inflow Similarity after Outflow Models

Inflow Similarity is the Dependent Variable (T+1)		Model 6	Model 7	Model 8a	Model 8b	Model 9	Model 10	Model 11
Prior Performance		4.43E-08 *	4.83E-08 *	4.77E-08 *	4.85E-08 *	4.83E-08 *	4.88E-08 *	4.8E-08 *
Stock General Human Capital		2.93E-05	0.001684 +	0.001645 +	0.001663 +	0.001681 +	0.00182 *	0.001713 +
Firm Age		2.14E-05	4.08E-05	4.23E-05	0.00004	4.19E-05	3.82E-05	4.42E-05
Service Diversification (rc)		-0.056199	-0.10441 +	-0.105783 +	-0.103796 +	-0.104949 +	-0.120439 *	-0.104247 +
Frequent Acquirer		0.051369 **	0.042102 **	0.042107 **	0.041745 *	0.041927 **	0.042161 **	0.04232 **
Outflow Similarity (rc)		-0.062147 *	-0.003942	-0.002377	-0.004325	-0.004026	-0.006063	-0.015428
Outflow Percent Previous Acquisition		0.013867	0.011631	0.012956	0.011787	0.011448	0.010818	0.010431
Outflow Percent Non-Rivalrous Destination		0.033492	0.028437	0.027853	0.027929	0.028357	0.028539	0.029595
Outflow Quantity	H5		0.016556 *	0.016679 *	0.015908 +	0.016533 *	0.015497 +	0.01481 +
Outflow General Human Capital (GHC)			0.000102	0.000196	0.000108	0.000103	8.39E-05	8.25E-05
Outflow Firm Specific Human Capital (rc) (FSHC)			0.004009	0.004013	0.005744	0.003977	0.004317	0.003561
Leverage			-0.024047 *	-0.023658 *	-0.024112 *	-0.024283 *	-0.024138 *	-0.023956 *
Geographic Diversification (GEOD)			0.00554 ***	0.00562 ***	0.005522 ***	0.005567 ***	0.00629 ***	0.005476 ***
Outflow Quantity x GHC	H6a			0.00026				
Outflow Quantity x FSHC (rc)	H6b				-0.000883			
Outflow Quantity x Leverage	H7					-0.000687		
Outflow Quantity x GEOD	H8						-0.000807	
Outflow Quantity x Outflow Similarity	H9							-0.022243
χ^2 -squared		142.24	202.35	203.93	203.36	202.44	203.85	202.16
Sample size		1133	1133	1133	1133	1133	1133	1133
Firms		202	202	202	202	202	202	202
Tobit panel model (xttobit) employed.		p < 0.10 + p < 0.05 * p < 0.01 ** p < 0.001 ***						
(rc) = reverse coded		Heckman control for selection bias (inverse Mills ratio) and year dummies included in analysis, but omitted here for space reasons.						

Table A4 – Firm Performance and the Temporal Effects of Outflows

Return on Sales is the Dependent Variable	T+1	T+2	T+3	T+4	T+5
	Model 12	Model 13	Model 14	Model 15	Model 16
Prior Performance	2E-08 *	1.52E-08 +	4.78E-09	4.01E-09	-1.09E-08
Firm Age	0.003303 +	-0.0018407	-0.0009308	0.0002979	0.0002016
Outflow Similarity (rc)	-0.0713343 *	-0.037459	-0.0430797	-0.0233518	-0.0141984
Outflow Percent Previous Acquisition	0.0033783	0.0047015	-0.0118476	-0.0004199	-0.0108907
Outflow Percent Non-Rivalrous Destination	0.0335061 *	0.0176112	0.0134957	0.0128535	0.0078806
Outflow Quantity	-0.0423469 *	-0.0231896	-0.0222677	-0.0127618	-0.0064773
Inflow Similarity (T+1)	H10 -0.0002195	-0.0001943	0.0114914 +	0.0069464	-0.0019431
Outflow General Human Capital	0.0000584	0.0000793	0.0000182	0.0000191	-0.0000859
Outflow Firm Specific Human Capital (rc)	0.0032227 +	0.0032695	0.0041094 +	0.0030783	0.001686
Leverage	-0.0202755 **	-0.0216274 ***	-0.0062302	-0.0067587	-0.0006239
Geographic Diversification	0.000081	0.0007638	0.0008427	0.0013576	0.0014741
F-test	3.38	5.85	5.41	7.19	6.68
Sample size	1117	1096	1076	1056	873
Firms	188	185	182	178	167

Two stage least-squares panel model (xtivreg2),
fixed effects by group (firm).
(rc) = reverse coded

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

Heckman control for selection bias (inverse Mills ratio) and year dummies
included in analysis, but omitted here for space reasons.

APPENDIX B

Figure B1 – Quality of Firm Specific PHC Moderation of Outflow Quantity-Firm Performance

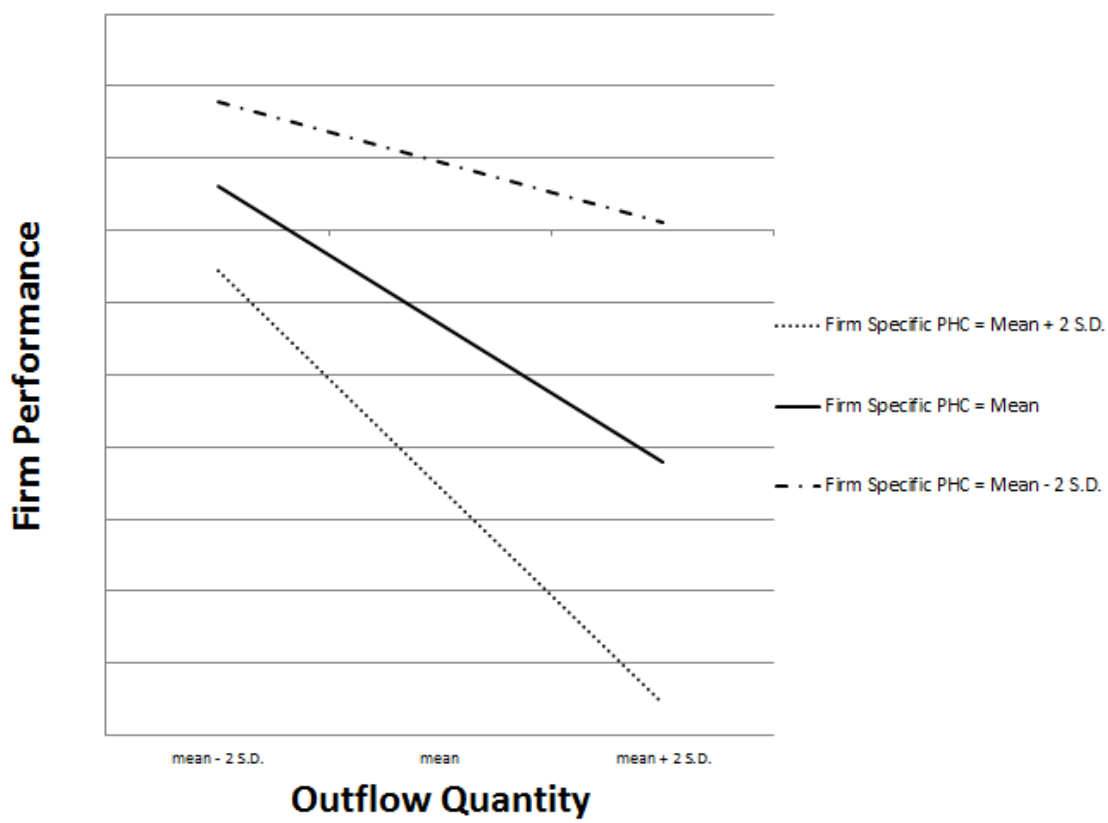
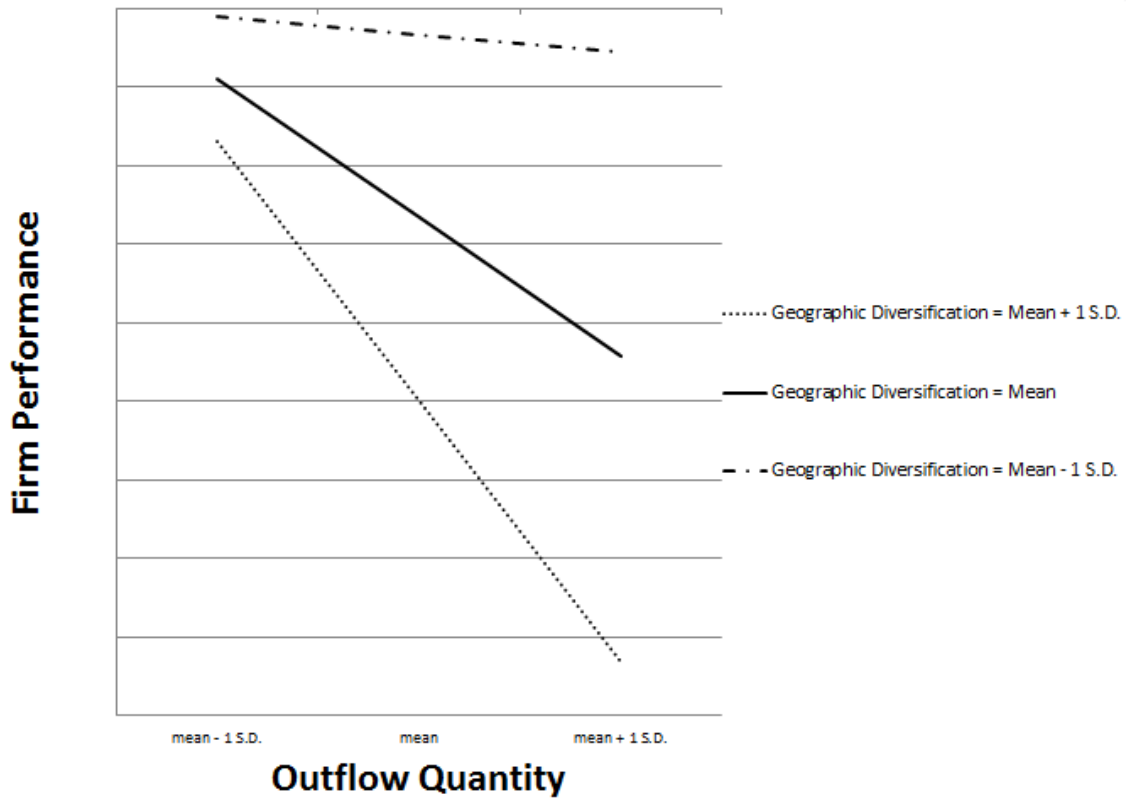


Figure B2 – Geographic Diversification Moderation of Outflow Quantity-Firm Performance



VITA

Name: Rhett Andrew Brymer

Address: 946 Silvoor Lane
Oxford, OH 45056

Email Address: rhett.brymer@gmail.com

Education: B.A., Chemistry, Kenyon College, 1995
M.B.A., Florida State University, 2001
M.S., Instructional Systems, Florida State University, 2003