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THE RELATIONSHIP BETWEEN HIGH PERFORMANCE WORK SYSTEMS AND FIRM
PERFORMANCE: EXAMINING CAUSAL ORDER AND THE MODERATING ROLES OF
HR STAFF-EMPLOYEE INTERACTION

BY

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DISSERTATION

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ABSTRACT

The current dissertation study examines causal directions between High Performance Work Systems (HPWSs) and firm performance, and the roles played by HR Staff-employee interactions in implementation processes of HPWSs, in two separate but interrelated studies.

In the field of strategic human resource management, extensive research efforts have been exerted in examination of the relationship between HPWSs and firm performance, returning only evidence of positive associations between them, but the causal directions of the positive associations have not been revealed. Thus, the first study of the current dissertation focuses on investigating the unrevealed causal mechanisms in HPWSs-firm performance relationship. The current study proposed reciprocal causality between HPWSs and firm performance, and then examined the causal directions with two waves of panel data collected from 225 South Korean firms in various industries, by utilizing a cross-lagged effect model. The findings showed that HPWSs and productivity resulted in each other, simultaneously. However, only HPWSs resulted in ROS and ROE without reversed causations. Further, no causal direction was found from the analyses with ROA. In addition, the current study also proposed and examined a moderating role played by the prior level of HPWS utilization in the causal relationship between the prior firm performance and HPWS utilization, but the result did not support the moderation.

In addition to the causal directions in HPWSs-firm performance relationship, the conditions for effective implementation of HPWSs were mostly unrevealed. Thus, the second study of the current dissertation focused on implementation processes of HPWS. The current study proposed the moderating roles played by HR staff-employee communication, employee perception of HR staff as strategic partners, and employee perception of HR staff as change

agents in HPWSs-firm performance relationship, and, then, examined the moderating effects with two waves of panel data collected through management survey and employee survey from 176 South Korean firms in various industries. The results of the study showed that the proposed moderators, which were found to be highly inter-correlated, moderated HPWSs-productivity relationship and HPWSs-ROS relationship in positive ways, as one moderating factor. In addition, the current study also found causal relationship between HPWSs and the moderating factor.

To My Parents

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CHAPTER 1

INTRODUCTION

Does human resource management contribute to firm performance? This is a question for which many of scholars, if not all, in the field of human resource management have long been pursuing the answer. Since the mid 1990s, strategic human resource management (SHRM), a subfield of human resource management, has emerged with the scholars searching for the evidence of the positive impact of human resource management on firm performance, the 'Holy Grail' of human resource management (Boselie, Dietz, & Boon, 2005; Kaufman, 2010a).

Extensive research has been conducted to find the support for the direct link between a bundle of HR practices, often referred to as High Performance Work Systems (HPWSs), and firm performance, and positive associations between HPWSs and various dimensions of firm performance have been reported by more than ninety empirical studies (see: Combs, Liu, Hall, & Ketchen, 2006; Wright, Gardner, Moynihan, & Allen, 2005). Although there is a lack of agreement among scholars regarding what HPWSs are and/or what practices HPWSs include (Arthur & Boyles, 2007; Becker & Gerhart, 1996; Lepak, Liao, Chung, & Harden, 2006), and equifinality of bundles of different HR practices may exist (Arthur & Boyles, 2007; Delery & Doty, 1996), generally accepted defining qualities include extensive selection and development of employees for attaining high quality human capital, significant rewards attached to employee performance for promoting employee motivation, and employee empowerment and participation for providing employees with opportunities to contribute (Lepak et al., 2006).

With the substantially cumulated empirical findings, and theoretical rationales drawn from a resource based view of a firm (Barney, 1991; Wernerfelt, 1984), which finds source of a

firm's sustainable competitive advantage from resources within a firm, SHRM scholars have been implicitly or explicitly contending that human resource management contributes to firm performance (e.g. Becker & Huselid, 2006).

However, the 'Holy Grail' claim has been also suffered from criticisms on its methodological and theoretical limitations (e.g. Kaufman, 2012; Wright et al., 2005); especially, it was pointed out that many of prior research designs have methodological limitations in examining causal directions between HR systems and firm performance, and that the mechanisms through which HPWSs influence firm performance has been rarely explored, yet (Becker & Huselid, 2006; Wright et al., 2005). First, association, in other words, co-variation, does not necessarily mean causation; the prior findings of positive association between HPWSs and firm performance, especially in cross sectional designs, do not necessarily support that the former causes the latter. It is possible that HPWSs results in firm performance enhancement, confirming the Holy Grail claim. However, it is also possible that firm performance results in investment in HPWSs, which may not have any substantive impact on firm performance (Abrahamson, 1996; DiMaggio & Powell, 1983). In addition, it is also possible that both HPWSs and firm performance co-evolve influencing each other (Lewin & Volberda, 1999).

Second, the black box between HR systems and firm performance has been rarely uncovered (Becker & Huselid, 2006). There has been only a number of attempts to theoretically and/or empirically reveal the mediating and moderating mechanisms between HPWSs and firm performance (e.g., Becker & Huselid, 2006; Bowen & Ostroff, 2004; Collins & Smith, 2006; Sun, Aryee, & Law, 2007), and more research on the mechanisms, especially on the largely unknown conditions for the effective implementation of adopted HR practices or systems, has been requested (Becker & Huselid, 2006; Sanders & Frenkel, 2011).

To fill these research gaps, the current dissertation examines possible causal directions between HPWSs and firm performance, and, then, suggests and examines organizational factors influencing the effectiveness of HPWS implementation, in two separate but interrelated studies.

First, in Chapter 2, the current study suggests firm performance as a possible predictor of HPWS utilization, and examines both directions of causality between HPWSs and firm performance. HPWSs are systems of HR practices or policies, and firms could adopt the systems only for display without actual use, or actually utilize the systems. Regarding the relationship between HPWSs and firm performance, what the current study means by HPWSs is actual utilization of HPWSs, and uses the terms, HPWSs, investment in HPWSs, HPWS adoption, HPWS enactment, and HPWS utilization, interchangeably. In this chapter, it is proposed that organizational slack resources which may accrue from successful firm performance (Cyert & March, 1963) may promote investment in HPWSs. In addition, following the co-evolutionary approaches of organizational theory (Lewin & Volberda, 1999), the current study examines both directions of causality between HPWS utilization and firm performance simultaneously, with two waves of panel data collected from 225 South Korean firms across industries, rather than focusing on examination of one causal direction. In addition, after examining the causal directions, the current study also assesses whether the prior level of HPWS utilization moderates the causal relationship between firm performance and HPWS utilization, to see whether the investments in HPWSs are gradually accelerated, through the recursive virtuous cycles of mutual influence between HPWSs and firm performance.

Second, in Chapter 3, the current study suggests that HR staff-employee interactions play critical roles in the process of HPWS implementation, based on the process perspective (Bowen & Ostroff, 2004; Sanders & Frenkel, 2011). The current study defines HPWS

implementation as the process of inducing value-creating behaviors of employees in each of a firm's work units, and HPWS adoption or utilization as the enactment of the HR systems to provide platforms for developing value creators and inducing their value-creating behaviors (Bondarouk, Looise, & Lempsink, 2009; Bowen & Ostroff, 2004; Sanders & Frenkel, 2011). Drawing from the organizational climate framework of Bowen and Ostroff (2004), the current study maintains that the successful inducement of employees' value creating behaviors may requires employees' clear understanding on the enacted HR systems, and employees' attention to their HR staff and HR systems. Then, the current study examines whether communication between HR staff and other employees, and other employees' perception on HR staff status promote the effectiveness of HPWSs implementation, with data collected from 176 South Korean firms across industries. In addition, the current study also assesses whether adoption of HPWSs itself positively affects other employees' perception on HR staff status, following the co-evolutionary framework (Lewin & Volberda, 1999).

The two waves of panel data utilized for the two studies in Chapter 2 and Chapter 3 were collected from South Korea. While growing amount of research in the field of human resource studies has accumulated evidence supporting the invariance of study results between studies conducted in the U.S. and those in other countries including South Korea (e.g. Bae, Chen, Wan, Lawler, & Walumbwa, 2003; Bae & Lawler, 2000; Guthrie, 2001; Razouk, 2011; Sun et al., 2007; Takeuchi, Lepak, Wang, & Takeuchi, 2007; Wu, Chen, Bae, Bai, Lew, Hong, & Lawler, 2011), the panel data on various organizational characteristics collected from South Korean nationwide representative sample of firms provides an opportunity to simultaneously examine both causal directions between HPWSs and firm performance by a cross-lagged effects model (Finkel, 1995), in Chapter 2. Moreover, the panel data also include individual-level survey items

collected from multiple employees at various ranks and functional units in each of the firms that participated in the organization-level survey, allowing the study on employee perception on an HR staff, in Chapter 3.

While the two separate studies in Chapters 2 and 3 focus on different research questions, they are highly interrelated and share, at least, two common themes. First, examining whether HPWSs are advantageous tools which actually result in firm performance enhancement, and when and how the tools could be utilized more effectively are important attempts searching for the 'Holy Grail' of human resource management. Understanding what are better tools may not guarantee a firm's success in performance, without understanding how to use the better tools. Second, the two studies follows the co-evolutionary approach (Lewin & Volberda, 1999). While many of prior organizational studies and human resources studies framed their interested phenomena through only one dominant disciplinary lens, and focused only on one direction of causality between interested constructs, preoccupied with assumptions on predicting and dependent variables. To provide more in-depth insight into the link between HR systems and firm performance, the two studies explore multiple directions of influences between principal constructs of interest.

The current dissertation study is composed of four chapters, a list of references and an appendix. The current chapter, Chapter 1, provides an overview of the dissertation study. Then, Chapter 2 presents the study on reciprocal causality between HR strategy and firm performance, and Chapter 3 provides the study on roles of HR staff-employee interactions in HR strategy implementation; in each of Chapters 2 and 3, an introduction, a literature review and hypotheses, research methods and results, discussion and conclusion, tables, and figures are presented. In Chapter 4, the conclusion of the current dissertation study is presented. Finally, a list of

references and an appendix that presents the items used in survey questionnaires are provided, at the end.

CHAPTER 2

RECIPROCAL CAUSALITY BETWEEN HR STRATEGY AND FIRM PERFORMANCE

INTRODUCTION

During the past two decades, scholars in the field of strategic human resource management (SHRM) have examined the relationship between HR systems and various dimensions of firm performance, based on the premises that people provide a source of sustainable competitive advantage of a firm and that how the people are led determines firm performance (Barney, 1991; Pfeffer, 1994; Wright & McMahan, 1992). The theoretical foundations for the link between HR systems and firm performance (e.g. Bowen & Ostroff, 2004; Delery & Doty, 1996; Lepak et al., 2006; Wright, Dunford, & Snell, 2001; Wright & McMahan, 1992), have been largely drawn from a resource-based view of strategic management (Allen & Wright, 2007; Barney, 1991; Penrose, 1959; Wernerfelt, 1984); however, extensive research has focused on empirical testing of the direct link between progressive HR systems, often referred to as high performance work systems (HPWSs), high involvement work systems, or high commitment work systems, and firm performance (Combs et al., 2006; Wright et al., 2005; The labels for HR systems may be used interchangeably in the current study).

While there is a lack of agreement among scholars regarding what HPWSs are and what practices these systems include (Arthur & Boyles, 2007; Becker & Gerhart, 1996; Lepak et al., 2006), generally accepted principles of HPWS include careful selection and extensive development of employees to assure higher quality, significant rewards attached to employee performance to motivate employees to contribute, and empowering employees to provide them

with opportunities to contribute (Lepak et al., 2006). Based on 92 empirical studies on the effect of HPWS from 1983 to 2005, a recent meta-analysis (Combs et al., 2006) reported generally positive associations between HPWSs and operational and financial firm performances across various industries.

Although prior empirical studies have provided considerable evidence for the positive association between HPWSs and firm performance, recent reviews, however, pointed out that a large number of prior efforts, many of which were made in cross sectional settings, tended to have methodological limitations for examining actual causality (Guest, Michie, Conway, & Sheehan, 2003; Wright et al., 2005). Positive association, in other words, co-variation, does not necessarily mean, causation (Campbell & Stanley, 1963). Even if there were no unknown factors affecting HPWSs and firm performance simultaneously, positive association alone would not be enough to support the hypothesis that people and people management may actually result in the sustainable success of a firm; it is also possible that firm performance may result in adoption of HPWSs (Datta, Guthrie, & Wright, 2005) while HPWSs may not affect firm performance, or that they may affect each other simultaneously.

One reason why the positive association between HPWSs and firm performance has been interpreted as HPWSs' causation of firm performance may be the belief that there is no theoretical support for the opposite direction of causality. While it has been largely acknowledged that HPWSs developing abilities, motivations and opportunities of employees would induce employees' value creating behaviors, and, in turn, result in firm performance enhancement (Lepak et al., 2006), it has been argued that there is little theoretical rationale for firm performance's causation of HPWS utilization (Becker & Huselid, 2006). Rather, an implicit assumption shared among SHRM researchers may be that firms should and therefore do adopt

and utilize HPWSs automatically, once they are known by the firms as superior HR systems and if the firms are economically rational (Kaufman, 2010a).

In this regard, the focus of SHRM research has been disproportionately concentrated on HPWSs' impact on firm performance, while finding antecedents for HPWSs' adoption has been almost neglected (Kaufman, 2010a; Kaufman & Miller, 2011; Paauwe & Boselie, 2005). However, some studies (e.g. Blasi & Kruse, 2006; Boxall & Macky, 2009; Freeman & Rogers, 1999; Ichniowski, Kochan, Levine, Olson, & Strauss, 1996) pointed out that HPWSs have not been widely adopted among firms in and out of the US, deviated from the anticipations of many other SHRM researchers; Kaufman (2010a) argues that the idea of performance advantage through a commitment/involvement based HRM was, in fact, introduced to US employers in the 1920s but, for more than eight decades, HPWSs have seen only limited adoption among US firms. These findings suggest that even if HPWSs' positive impact on firm performance is valid, some critical factors that prior SHRM studies neglected to find may affect the adoption of HPWSs, and the current study suggests that organizational slack resource which may accrue from a high level of firm performance (Cyert & March, 1963; Sharfman, Wolf, Chase, & Tansik, 1988; Singh, 1986) may affect the propensity of a firm's investment in HPWSs.

Furthermore, institutional theory (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Scott, 2001) maintains that firms embedded in surrounding institutions of regulations, norms, and taken-for-granted thoughts adopt practices commonly shared among their organizational field, often without efficiency considerations; it is implied that HPWSs could be spread among firms facing uncertainty without substantive impact on firm performance (Abrahamson, 1996; Varma, Beatty, Schneier, & Ulrich, 1999), as long as the firms can afford to make the investment in the fashionable HR systems.

Therefore, examining causal direction between HPWSs and firm performance with greater methodological rigor will further advance the field of SHRM (Cappelli & Neumark, 2001; Wright et al., 2005). Moreover, the co-evolutionary perspectives (Dijksterhuis, Van den Bosch, & Volberda, 1999; Lewin & Volberda, 1999; Paauwe & Boselie, 2005; Volberda & Lewin, 2003) suggest that organizations' intentionality and their institutional environments may co-evolve, influencing each other and jointly producing organizational phenomena, and imply that making distinctions between cause and effect in explanations of organizational phenomena is less meaningful. Rather than focusing on one direction of causality through a single theoretical lens, considering co-evolution of HPWSs and firm performance with multiple theoretical lenses may provide more in-depth insights into the HRM-firm performance link.

The current study suggests and examines the reciprocal causality between HPWSs and firm performance with two waves of panel data collected across various industries in Korea. The two-wave panel setting provides an opportunity to utilize a cross-lagged effects model (Finkel, 1995; Wright et al., 2005) that allows for examining both directions of causal orders between HPWSs and firm performance, simultaneously.

THEORETICAL BACKGROUND AND HYPOTHESES

Strategy and SHRM

The theoretical developments in the field of SHRM, which emphasizes viewing people as value creators rather than objects of control and maintenance like other organizational assets, have been largely affected by the progress of the field of strategic management, which underwent an evolutionary shift of its focus of analysis from the outside of a firm to the inside of

a firm in the late 1980s (Chadwick & Dabu, 2009; Wrigh & McMahan, 1992; Wright et al., 2001).

Until the late 1980s (Wernerfelt, 1995), strategy studies had been conventionally dominated by industrial organization economics models (Bain, 1956; Mason, 1949; Porter, 1980) that pursued competitive advantage in the market positioning of homogeneous firms in a given market environment (Barney, 1986). In other words, the conventional approaches focused on monopoly rents generated by building and maintaining high entry-barriers against competition in a focal product market.

The resource-based view of a firm (Barney, 1991; Penrose, 1959; Wernerfelt, 1984), however, focuses on the heterogeneous attributes of firms that had been largely ignored by the conventional approaches and finds a source of sustainable competitive advantage or rent within a firm. Barney (1991) submitted that *valuable, rare, inimitable and nonsubstitutable* (VRIN) resources are the source of sustained competitive advantage. *Valuable* means that the resource has use-value, not exchange-value, in such a way that the resource can contribute toward achieving organizational goals. *Rare* means that this resource has inelastic supply and is not prevalent among firms, so that the ownership of the *valuable* and *rare* resource can achieve competitive advantage, i.e. Ricardian rent. *Inimitable* means that other competing firms cannot generate and obtain the *valuable* and *rare* resource by imitation; the *inimitability* stems from causal ambiguity in the link between resources and a firm's competitive advantage, social complexity in resource generation, and/or historical path dependence of resource generation. Finally, *nonsubstitutable* means there is no other alternative that can bring an equivalent use-value to the focal resource. From the conditions of *inimitability* and *nonsubstitutability*, the competitive advantage of a firm or achievement of Ricardian rent is *sustained*, and the role of

inimitability and *nonsubstitutability* is comparable with the role of the entry-barriers in monopoly rent seeking in the traditional industrial organization economics models (Mahoney & Pandian, 1992; Reed & DeFillippi, 1990).

The competence-based view or the core-competency approach (Leonard-Barton, 1992; Prahalad & Hamel, 1990) also led to progress in the field of strategic management, together with the resource-based view. The competence-based view emphasizes a firm's capabilities to deploy and coordinate the stock of resources within the firm for value creation, and suggests core capabilities as a source of competitive advantage (Amit & Schoemaker, 1993). Prahalad and Hamel (1990) defined core competencies as "the *collective learning* in the organization, especially how to coordinate diverse production skills and integrate multiple streams of technologies" (1990: 82, emphasis added). And Leonard-Barton (1992) maintained that a core capability is an *institutionalized* knowledge set providing competitive advantage, and that it is embedded among employees' knowledge and skills, the technical system, the managerial system, and the values and norms within a firm. The suggested characteristics of a core capability may satisfy the VRIN conditions for sustained competitive advantage suggested by the resource-based view (Barney, 1991).

The dynamic capabilities approach (Teece & Pisano, 1994; Teece, Pisano, & Shuen, 1997) extended the progress of strategic management started by the resource-based view and the competence-based view, by integrating them with the conventional market-based approaches. Based on evolutionary economics or Schumpeterian economics (Nelson & Winter, 1982; Schumpeter, 1934), the dynamic capabilities framework pursues the sustaining of competitive advantage by continuous innovations through creative destruction (Schumpeter, 1942) of existing core competences under rapidly changing environments where the strategic value of

core competences may keep eroding. Winter defined organizational capability as “ *a high-level routine (or collection of routines) that, together with its implementing input flows, confers upon an organization’s management a set of decision options for producing significant outputs of a particular type*” (2000: 983). The accumulation of competences in the repertoires of organizational routines, (Cyert & March, 1963; March & Simon, 1958; Nelson & Winter, 1982), which directly respond to external environments without the guidance of managerial decisions (Levitt & March, 1988), implies that the dynamic capability approach provides a rationale favorable for a bottom-up flow of innovative change rather than a top-down flow intended and led by management (Von Krogh & Grand, 2002).

Although theory development of SHRM has been stimulated by various theoretical models taken from multiple disciplines such as agency theory, transaction-cost theory, resource dependence model, institutional theory, etc (Wright & McMahan, 1992), SHRM research has largely rooted its theoretical foundations in the aforementioned series of strategic management frameworks which focus on intra-firm effectiveness (Wright et al., 2001), and most SHRM literature has presented, at least, the resource-based view as a broad theoretical justification at some point (Becker & Huselid, 2006; Chadwick & Dabu, 2009).

Based on the resource-based view, the competence-based view, and the dynamic capability approach, Wright, Dunford and Snell (2001) suggested three HR components that provide a source of sustained competitive advantage: a human capital pool, employee relationships and behaviors, and a people management system. A human capital pool is composed of the employees' stock of knowledge, skills and abilities. Employee relationship and behaviors stands for employees' motivations and behaviors to utilize their human capital toward organizational goals. And a people management system is a collection or bundle of multiple HR

practices (MacDuffie, 1995) that develops the human capital pool and induces employees' behaviors consistent with organizational goals. In addition, it is contended that the combination of the three basic components, not any single component, provides core competence through a dynamic process of developing and renewing the knowledge stock and knowledge sharing within a firm. Due to the complexity and historical path dependency of a people management system and the process in which human capital and behaviors generate core competence, competing firms cannot easily imitate the HR components, and the competitive advantage provided by core competence is sustained, as long as the core competence keeps being renewed successfully.

Further, Chadwick and Dabu (2009) delineated how human resources and human resource management can contribute in firms' economic rent seeking behaviors by focusing on three different types of economic rents that the resource-based view and the dynamic capability approach pursue: traditional Ricardian rent, non-traditional Ricardian rent and entrepreneurial rent. As described previously, the VRIN characteristics of resources in the resource-based view framework (Barney, 1991) provide Ricardian rent that accrues from exclusive ownership of valuable and rare resources. Chadwick and Dabu (2009) further divided Ricardian Rent into traditional and non-traditional Ricardian rent; traditional Ricardian rent accrues from the ownership of scarce resources inherently carrying values from resource markets. Non-traditional Ricardian rent accrues from the ownership of scarce resources the values of which are developed within the firms having ownership. And entrepreneurial rent, also referred to as Schumpeterian rent, is achieved through unique insight about market opportunities and risk taking for destructive innovation, which the dynamic capability approach pursues.

In achieving those three different economic rents, HRM activities commonly involve acquiring, retaining, training, motivating and coordinating human resources, and the types of

economic rents achieved are often intermingled. However, the emphasized HRM activities for each type of economic rent vary. In traditional Ricardian rent seeking, HRM may contribute by attaining inherently valuable and rare human resources from labor markets where access to those human resources are not equally distributed to each firm, and by retaining and motivating them to participate in core competence development or directly provide valuable end product. In non-traditional Ricardian rent seeking, HRM activities may contribute mainly by deriving attained human resources' co-specialization with other tangible and intangible organizational assets through intensive training, and then generating core competences through the firm specific human capital. In entrepreneurial rent seeking, HRM may contribute mainly by attaining entrepreneurial capital and providing opportunities for innovation to management and the workforce through effective knowledge and information sharing.

An example of a professional soccer club may provide a simple sketch of how HRM activities contribute in achieving the economic rents presented above. A professional soccer club in Spain sent its recruiters to a small village in Argentina to recruit a young and inherently talented soccer player before other rival clubs found him. The player's inherent ability to control a ball and score goals was at a world class level and seemed to grow continuously (Traditional Ricardian rent seeking). After the recruitment, the player eventually blended into the team with other colleague players through an intensive training program with unique team strategies directing players how to play games, together with team colleagues, under various situations confronted during games (Non-traditional Ricardian rent seeking). These unique team strategies had been established by the constant accumulation of the experiences and ideas from the coaching staff and the players, over a long period of time. The players had been allowed to modify their roles and activities within the frame of the team strategies, depending on each

problem they confronted during matches. Moreover, the players could freely suggest better team strategies to the coaching staff from their own experiences of matches. Based on the information delivered by the players, trainers and other staff members, and from direct observations of game matches, the head coach made the decisions for partial modification or total change of team strategies; then the training programs and target players for recruiting were modified according to the team strategy (Entrepreneurial rent seeking). For many seasons, the unique and continuously morphing team strategies provided the team more chances of making goals than other teams and the inherently talented player never missed the chances for goals given to him, resulting in league championships titles for the team and top scorer awards to the player (Three economic rents are achieved and sustained within a market).

HR Systems as A Cause of Firm Performance

The connection between strategy and HRM proposes critical roles for human resources and HRM activities in achieving and sustaining the competitive advantage of a firm (Chadwick & Dabu, 2009; Wright et al., 2001; Wright & McMahan, 1992). Achieving and sustaining various economic rents through human resources may involve various HRM activities such as attaining, retaining, motivating, and coordinating human resources simultaneously, and, even further, human resources may also contribute to achieving multiple conceptually distinguished economic rents at the same time (Chadwick & Dabu, 2009). The research may imply that a system of multiple HR practices may work better for achieving sustained competitive advantage than each individual HR practice alone (Guerrero & Barraud-Didier, 2004; Ichniowski, Shaw, & Prensushi, 1997; MacDuffie, 1995; Wright et al., 2001; Wright & McMahan, 1992), and such a

system approach has become one of SHRM research's features, distinguishing SHRM from traditional HRM research(Becker & Huselid, 2006).

SHRM scholars' ongoing efforts toward conceptualizing systems of HR practices for sustained competitive advantage have been guided by three different modes of theorizing: universalistic, contingency, and configurational perspectives (Delery & Doty, 1996; Lepak & Shaw, 2008). Universalistic or best practices perspectives contend that certain HR practices may be superior to alternatives in every case, and that greater use of the best practices would result in better firm performance (Huselid, 1995; Osterman, 1994; Pfeffer, 1994, 1998). For instance, Pfeffer originally suggested sixteen HR best practices (Pfeffer, 1994) and then reduced them to seven (Pfeffer, 1998) based on his reviews of practices adopted by successful companies; the seven HR practices are employment security, selective hiring, organizational design based on self-managed teams and decentralized decision making, market competitive and performance-based pay, extensive training, reduced status differentiation, and extensive information sharing.

Contingency perspectives (Kaufman, 2010a; Miles & Snow, 1984; Schuler & Jackson, 1987) contend that HR practices consistent with contextual contingency factors may be superior to inconsistent alternatives, and therefore HR practices should be consistent with external contingencies to achieve maximal effectiveness. The primary contingency factor to align an HR system with has been firm strategy (Arthur, 1992; Jackson & Schuler, 1995; Miles & Snow, 1984; Schuler & Jackson, 1987; Sun et al., 2007; Youndt, Snell, Dean, & Lepak, 1996), while some other contextual factors such as characteristics of industry (Datta et al., 2005), labor market condition (Sun et al., 2007), and national culture (Wu et al., 2011) were also considered.

Configurational perspectives contend that HR systems composed of mutually consistent HR practices may be more effective than other configurations of HR practices or isolated HR

practices. Scholars of configurational perspectives argue that employees are usually exposed to multiple HR practices simultaneously and a group of HR practices in a positively synergetic combination rather than individual HR practices would have a greater effect on employee and firm performance. A number of researchers supporting contingency perspectives (Arthur, 1992; Delery & Doty, 1996; Miles & Snow, 1984) connected the concept of internal consistency (horizontal fit) with the concept of external consistency (vertical fit) developed by the contingency perspective. Assuming equifinality, a situation where multiple HR system configurations of equally maximal effectiveness may exist, the scholars supporting a horizontal - vertical fit perspective have suggested theoretically-driven prototypical HR systems per external contingency.

Although SHRM scholars have utilized different perspectives for different inquiries in their research, and the three perspectives may seem incompatible (Delery & Doty, 1996), theoretical and empirical research in SHRM has been evolving through a combination of the three perspectives. First, the system approach suggested by the configurational perspective has been widely accepted by SHRM scholars (Wright & Boswell, 2002), regardless of their positioning between universalistic and contingency perspectives. Rather than focusing on universally superior practices and their individual effects, SHRM scholars have generally admitted universal principles for constructing an effective HR system. The universal principles require effective HR systems to include HR practices for increasing the quality of employees' knowledge, skill and abilities relevant to strategic value creations, motivating the employees to contribute for strategic value creations, and empowering the employees to realize their potential for strategic value creations (Combs et al., 2006; Lepak et al., 2006; Wright et al., 2001). Further, the concept of a contingency perspective was differentiated into two possibilities, weak

contingency that allows compatibility between contingency and a universalistic perspective (Huselid, 1995; Youndt et al., 1996) and strong contingency that denies the compatibility (Kaufman, 2010a). Although there could be unexplored strong contingency factors that would nullify positive effects of universally good HR systems (Kaufman, 2010a), Huselid maintained, “*All else being equal*, the use of High Performance Work Practices and good internal fit should lead to *positive outcomes for all types of firms*. However, *at the margin*, firms that tailor their work practices to their particular strategic and environmental contingencies should be able to realize *additional performance gains*” (1995: 644, emphases added).

Since Huselid (1995)’s landmark study presented a positive relationship between a system of high performance work practices and employee turnover, productivity and financial performances across various industries, extensive empirical research has added support for positive associations between HPWS and various operational and financial firm performances across various industries (e.g. Batt, 2002 (service industry); Collins & Smith, 2006 (IT industry); Delery & Doty, 1996 (banking industry); Ichniowski et al., 1997 (steel manufacturing)), and in and out of the US (e.g. Bae & Lawler, 2000; Guest et al., 2003; Guthrie, 2001; Razouk, 2011; Sun et al., 2007). For instance, Ichniowski, Shaw and Prennushi (1997) presented a positive relationship between an innovative HR system and productivity in 36 homogeneous steel production lines, and Collins and Smith (2006) found a positive effect of the commitment-based work system on firm profitability by promoting knowledge exchange and combination. Further, Bae and Lawler (2000) reported a positive relationship between the high involvement work system and firm profitability across industries in Korea, and Guthrie (2001) found a negative association of the high involvement work system with employee turnover rate and a positive association with productivity across industries in New Zealand.

Even when HPWS - firm performance relationships were examined together with the fits from several contingency factors, some studies presented significant and independent positive relations between the HR system and firm performance, together with significant moderation effects of contingent factors (e.g. Datta et al., 2005; Sun et al., 2007; Wu et al., 2011). For instance, Datta, Guthrie and Wright (2005) found positive relationship between HPWS and productivity, together with additional moderating effects of industry characteristics such as capital intensity and industry growth rate. In their study on the Chinese hotel industry, Sun, Aryee, and Law (2007) found positive associations between HPWS and productivity and negative associations between HPWS and employee turnover, together with mediation of service oriented citizenship behaviors in the HPWS - firm performance links and contingencies with business strategy and labor market conditions. Further, Wu, Chen, Bae, Bai, and their colleagues (2011) examined the influence of national cultures on the relationship between HPWS and employee voluntary turnover in foreign affiliates of American multinational companies in fourteen countries, and found a negative relationship between HPWS and employee voluntary turnover, together with the moderating effect of national culture.

With the extensive empirical evidence supporting direct positive relationships between high performance work systems and various firm performances across industries and countries, and theoretical foundations based on strategic management theories emphasizing internal effectiveness of firms, SHRM researchers have been contending about the contributions of people and people management systems to the sustained competitive advantage of a firm. Therefore, the current study examines the causal direction from HPWSs to firm performance with the following hypothesis:

Hypothesis 1: HPWSs will increase firm performance.

Co-variation vs. Causation

A great deal of empirical evidence supports direct positive relationships between HPWS and firm performance, and theoretical foundations supporting HPWS's contributions to the sustained competitive advantage of firms have been suggested; however, some scholars argue that a large part of the prior empirical efforts tended to lack methodological rigor sufficient to present a causal relationship between HPWS and firm performance (Cappelli & Neumark, 2001; Combs et al., 2006; Guest et al., 2003; Razouk, 2011; Wright et al., 2005). Wright and his colleagues (2005) argued that much prior empirical research, largely conducted in cross-sectional frames, has only demonstrated co-variations between HPWS and firm performance, failing to adequately satisfy criterion for temporal precedence of cause, and overlooking the possibility of reversed causality from firm performance to HPWS utilization. After reviewing 68 empirical studies that reported a statistically significant relationship between HPWS and firm performance from 1995 to 2003, Wright and his colleagues (2005) contended that about 85% of the prior studies they reviewed failed to satisfy the criterion of temporal precedence of cause by adopting one of three insufficient research designs: post-predictive, contemporaneous or retrospective design. Post-predictive design measures HPWSs after firm performance periods, and results in examination of the current HPWSs-past firm performance link; Wright and his colleagues (2005) argued that 70 % of the reviewed studies fall under post-predictive design. Contemporaneous design measures contemporaneous HPWSs and firm performances, and causal direction cannot be drawn. Finally, retrospective design measures HPWS before the firm

performance period, but asks respondents to recall the past HPWSs after firm performances are realized.

While the methodological limitations of prior studies for examining actual causal directions between HPWSs and firm performance have been widely acknowledged in the discussion sections of numerous empirical studies (Becker & Huselid, 2006), only a few studies actually attempted an examination of the causal directions (e.g. Guest et al., 2003; Huselid, Jackson, & Schuler, 1997; Razouk, 2011; Wright et al., 2005), and the results mostly did not find evidence supporting the causal direction from HPWSs to firm performance. For instance, Guest, Michie, Conway, and Sheehan (2003) examined the impact of one- year lagged HPWSs on productivity and profitability in 366 firms in the UK and found positive associations. However, after controlling for prior firm performances up to the period of the HPWS survey, the significant relationships disappeared. In the study on 45 business units of a food service company in the US and Canada, Wright and his colleagues (2005) also reported that HPWS was correlated with the past, current and future firm performances, and that the statistically significant associations with future firm performances largely disappeared after controlling for past or concurrent firm performances. Although it is not an examination of HPWS and firm performance, Huselid, Jackson and Schuler (1997) examined the impact of HRM effectiveness on productivity and profitability, and reported positive associations between strategic HRM effectiveness and the firm performances. However, after controlling for contemporaneous firm performances, both the size and significance of the coefficients were largely reduced almost to zero.

Given the positive association between HPWSs and firm performance found in extensive prior research, the negative test results may imply the possibility of reversed causal direction from firm performance to HPWS utilization. Assuming the causal direction from HPWSs to firm

performance, however, Becker and Huselid (2006) maintained that more elaboration of theories on the process between HPWS and firm performances would overcome the methodological limitations, and that there is little theoretical rationale for reversed causality. Rather than there could be little theoretical rationale for the reversed causality, however, it is also possible that finding antecedents of HPWSs adoption may have been simply neglected (Kaufman, 2010a; Kaufman & Miller, 2011; Paauwe & Boselie, 2005). Under the assumptions of economic rationality and complete knowledge and information on superior HR systems across firms, the dearth of interest in the factors affecting HPWSs adoption may be a reasonable result since all the rational firms will adopt HPWSs quickly as long as the HPWSs are the best practices; instead, a remaining question would be whether firms would achieve a sustainable competitive advantage by the best practices when all the firms adopt these best practices (Becker & Huselid, 2006), rather than why and how firms adopt HPWSs.

However, some studies (e.g. Blasi & Kruse, 2006; Boxall & Macky, 2009; Freeman & Rogers, 1999; Ichniowski et al., 1996; Kauhanen, 2009) point out that HPWSs have not been widely adopted among firms in and out of the US, contrary to the expectations of mainstream SHRM; Blasi and Kruse (2006) reported that in their nationally representative sample collected in 1994 and 1997, only about one percent of US firms adopted a full level of HPWSs, while more than 80 percent of firms adopted none to a negligible level of HPWSs. In addition, based on the national survey conducted by Freeman and Rogers (1999) in 1994 and 1995 and the data collected by the Bureau of National Affairs in 2005 and 2006, Kaufman (2010a) also contended that HPWSs have only been limitedly adopted among firms in the US, although the idea of performance advantage through commitment/involvement based HRM was introduced to US employers in the 1920s.

The paradoxical distribution of HPWSs' adoption may imply that HPWSs do not have positive impacts on firm performance. However, it is also possible that the dispersion of HPWSs may require some necessary conditions even when HPWSs have economic merit, at least, in theory. If the assumption of complete knowledge and information on superior HR systems equally across firms does not hold, and/or if firms vary in some critical factors that affects a firm's capability of adopting certain HR practices or a system of HR practices, regardless of whether the practices actually impact firm performance or not, the automatic diffusion of HR practices may not hold. Firms may fail to adopt HPWSs since they do not know about HPWSs (Pfeffer, 1998; Rynes, Colbert, & Brown, 2002), or since they cannot afford HPWS adoption (Bamberger & Meshoulam, 2000; Kimberly & Evanisko, 1981; Rosner, 1968; Wright et al., 2005).

Again, the positive correlation between HPWSs and firm performance found in prior research may imply either one or both of the causal directions from HPWSs to firm performance and the vice versa. Especially, if prior level of firm performance is one of the factors influencing a firm's capability of adopting HR practices, the reversed causality from firm performance to HPWSs adoption could hold, whether HPWSs actually result in firm performance or not. If it is the case, ignoring the mechanism of HPWSs' adoption could have misled us about the nature of the relationship between HPWSs and firm performance, prohibiting us from valid evaluations of HPWSs' impact on firm performance (Kaufman, 2010a; Kaufman & Miller, 2011; Paauwe & Boselie, 2005).

Heterogeneous Capability of HPWS Adoption

Firms may differ in capability of HPWS adoption. Based on his observations of firms, Pfeffer (1998) maintained that only one-half of people may believe the connection between people management and firm profitability, only one-half of the people believing the connection may understand the holistic approach of HR systems, and, finally, only one-half of the people understanding the system approach may persistently commit to the adopted HR systems until the benefit of HR systems are derived, thus resulting in diffusion of effective HR systems only among one-eighth of organizations. Even if most firms believe and publicly acknowledge that people management is important (Barney & Wright, 1998), not all the firms may adopt effective HR systems, especially if they are not able to do so. Pfeffer's (1998) comment implies that adoption of effective HR systems may require understanding on the systems and organizational resources to afford the HR investment and that the capability may vary across firms, resulting in limited diffusion of effective HR systems.

Regarding the nature of HR practice adoption, various theories and perspectives from I-O psychology, economics, strategic management, and organization theory would provide various explanations that are seemingly contradicting but in fact complement each other (see: Bamberger & Meshoulam, 2000; Johns, 1993; Subramony, 2006). For instance, economic perspectives (e.g. Boudreau & Ramstad, 2003; Cappelli & Neumark, 2001; Kaufman, 2010a; Kaufman & Miller, 2011) contend that HR practice adoption would be determined based on the calculation of expected cost and benefit of the adoption assuming perfect economic rationality; firms would invest in the best HR practices or the best set of HR practices to the level at which the cost of marginal investment equals marginal profit gain from the additional investment. Further, with the assumption of bounded rationality (March & Simon, 1958) rather than perfect rationality of a firm, it can be argued that firms may only incrementally invest in certain HR practices, which

may be found both in and out of the firm through searching activities, and they will repeat the evaluation of marginal cost and benefit of the prior investment for the decision-making of the future investment as a trial- and- error experiment for problem solving or innovation (Cyert & March, 1963; Levitt & March, 1988). On the other hand, new institutional theory (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Scott, 2001) contends that firms are embedded in institutional environments, and that the institutions of regulative rules, shared norms, and taken-for- granted understandings (Scott, 2001) affect practice adoption of the firms rather than managerial intentionality based on cost-benefit calculations; simply, firms adopt certain HR practices since the adoption is required by legal regulations. Even when there is no regulative coercion in the choice of HR practices to adopt, HR managers may adopt certain HR practices following norms shared by HR professionals or imitating practices of other successful organizations (DiMaggio & Powell, 1983). Moreover, pluralistic perspectives (Dijksterhuis et al., 1999; Oliver, 1991; Selznick, 1996) suggest that a firm's discretionary actions and the pressures from the surrounding institutions may co-exist and co-evolve, thus influencing each other; for instance, a firm could adopt certain HR practices or systems of HR practices from their institutional environment, evaluate the economic merits of the adopted HR practices, and, in turn, augment the shared legitimacy of the HR practices by confirming the practices value (Dijksterhuis et al., 1999).

These perspectives predict that firms will adopt HR practices that have either one or both of technical merits and social legitimacy (Paauwe & Boselie, 2005) in common, at least in the long run, and suggest that HPWSs are likely to be widely adopted across firms if they are HR systems superior to other traditional and control-based HR systems (Becker & Huselid, 2006), and/or if they are perceived as legitimate HR systems by various stakeholders of firms. While

these perspectives suggest the technical or institutional values of HR practices as one of the antecedents of HR practice adoption, based on the proposed mechanisms of practice adoption that are assumed to be universally applicable across firms, however, consideration of firms' heterogeneity in knowledge capacity and financial resources suggest possible failure in adoption of valuable HR practices.

First, firms could fail to adopt HPWSs simply because they do not know about HPWSs. The knowledge on HPWSs may be diffused by HR professionals trained by HR or business schools, business consultants, HR magazines, academic journals, and other business mass-media, or by observing other successful firms which have already adopted HPWSs, unless firms realize the advantage of HPWSs by self-experiments or regulations require adoption of HPWSs (Abrahamson, 1996; Bamberger & Fiegenbaum, 1996; DiMaggio & Powell, 1983). Besides the individual firms' R&D efforts on HPWSs and the possibility of regulative coercion of implementing HPWSs, firms may vary in the number of HR professionals aware of and understanding HPWSs, and in the number of chances to be exposed to and understand advice of schools, consultants, magazines or academic journals advertizing HPWSs.

Rynes and her colleagues' survey on HR practitioners (2002) reported that there were substantial differences between research findings and HR practitioners' beliefs on some HR issues, and that HR practitioners' beliefs on many HR research findings greatly varied among HR practitioners. In addition, it was also maintained that HR practitioners who were at a higher positional rank, had HR certifications, or sought information from academic reading or consultants, were more likely to agree with academic research findings (Rynes et al., 2002).

In addition, the limited number of firms adopting HPWSs (e.g. Blasi & Kruse, 2006; Freeman & Rogers, 1999) may imply less chance of imitation by others, and even when firms

could observe HPWSs adopted in other successful firms, they could mimic only a few of the individual HR practices rather than a whole system of HR practices due to the lack of understanding of HPWSs (Pfeffer, 1998). Cohen and Levinthal (1990) maintained that innovation from outside knowledge may require prior related knowledge that allows evaluating and recognizing the value of outside knowledge and utilizing it, and called the ability to exploit outside knowledge coming from prior related knowledge as *absorptive capacity*. Even if firms are exposed to HPWSs advertisers or other successful firms, they may fail to utilize HPWSs due to the lack of absorptive capacity, which may accrue from a firm's prior investment in human capital, education, training and consulting for achieving knowledge unrelated to the firm's ongoing operation (Cohen & Levinthal, 1990; March, 1991).

Second, even with enough absorptive capacity for HPWS adoption, firms may fail to adopt HPWSs when they cannot afford HPWSs (Bamberger & Meshoulam, 2000; Wright et al., 2005). It has been contended that organizational innovations could be costly to employers and may require financial slack resources (Cyert & March, 1963; Damanpour, 1991; Kimberly & Evanisko, 1981; Rosner, 1968; Thompson, 1965); adoption and retaining of certain practices may require continued investment of financial resources. In addition, firms may need to absorb failures that may occur during the early period of innovative transition due to organizational inertia against change (Hannan & Freeman, 1977, 1984), and/or due to the inherently time-dependent realization of the benefit from innovation, if the failure is not permanent. Moreover, the development of the aforementioned absorptive capacity that are needed for innovation or exploratory experiments for new ideas may also require persistent investment of financial slack resources (Nohria & Gulati, 1996).

Firm Performance as A Cause of HPWS Adoption

Cyert and March defined organizational slack resources as the “difference between the payments required to maintain the organization and the resources obtained from the environment by the coalition” (1963: 279), and Singh (1986) differentiated the concept of slack into *absorbed slack* and *unabsorbed slack*; absorbed slack means slack resources already committed as excess cost for organizational operation and unabsorbed slack means uncommitted excess liquid resources such as uncommitted money. Absorptive capacity may accrue from absorbed slack invested into human capital development, and adoption of costly practices may be afforded by unabsorbed slack, at least, until possibly time-dependent returns of investments are achieved.

While developing absorptive capacity on HPWSs may require slack resources, the transition from traditional and control-based HR systems to HPWSs may also require slack resources like other organizational innovations. Use of HPWSs can be seen as investment in human capital development through extensive selection and training, and more sharing of profits for motivation enhancement by compensating for employees’ contributions rather than their contracted work times (Wright et al., 2005), and therefore it may be costly (Cappelli & Neumark, 2001). Moreover, use of HPWSs may involve persisting financial investment since the development of valuable human capital and motivation may be time dependent and the value of developed human capital may erode as time goes on. In addition, firm performance may drop during the early period of introducing HPWSs due to the hurdle of organizational inertia and destruction of prior competence (Hannan & Freeman, 1977; Johns, 1993; Pil & MacDuffie, 1996).

In these regards, knowing HPWSs and adopting HPWSs may require organizational slack resources, and only a limited number of firms could have adopted HPWSs to the desired level,

since firms vary in possessed organizational slack resources. Moreover, it has been argued that organizational slack resources may accrue mainly from organizational performance (Cyert & March, 1963; Singh, 1986), and, therefore, prior firm performance may be one of the predictors of HPWS adoption (Wright et al., 2005).

However, the claim of firm performance as a predictor of HPWS adoption may pose a paradoxical question as to why high-performing firms look for organizational change, such as the adoption of expensive HPWSs, while they are doing well. Failure may breed searching for and adopting alternative ways of doing (Cyert & March, 1963); low-performing firms may be more likely to search for alternatives in order to resolve their problems, and may resolve the problem by adopting those alternatives. High-performing firms, however, may be more likely to remain committed to their prior routines of operations, which have shown an at least acceptable level of technical advantage, and, therefore, have been perceived as legitimate by organizational constituents. High performance of a firm could have been resulted from prior investment in HPWSs as Hypothesis 1 proposed, but it could have been achieved by various other reasons. If the latter is the case, currently high-performing firms could be reluctant to implement organizational change for additional gains, which are not assured (March & Simon, 1958; Singh, 1986; Tversky & Kahneman, 1974).

On the other hand, successful firms may still be thirsty for organizational innovation (Abrahamson, 1996; Cyert & March, 1963). Abrahamson (1996) asserted that managers are under the societal pressure of *norms of management progress*, expecting never-ending improvements of management techniques, similar to academic researchers under the norms of scientific progress expecting never-ending improvement of understanding; as norms of rationality (Meyer & Rowan, 1977) may force managers to use practices perceived as rational by

stakeholders, norms of management progress may press managers to seek progressive and/or fashionable management techniques to create the appearance of improvement of management techniques, especially to more extent when their firms are successful and have high reputations (Abrahamson, 1996; Johns, 1993). Cyert and March (1963) conceptually distinguished two types of innovations; *problem-oriented innovations* and *slack innovations*. Problem-oriented innovations are innovations driven by currently faced specific failures and problems, and easily justifiable as solutions for the problems in the short run. On the other hand, slack innovations are innovations driven by the pursuit of technological improvements, which may not necessarily be approved during times of tight budgeting; while slack innovations for technological improvements may contribute to the goals of subunits claiming the investments, such as professional status or subunit prestige, the actual technical merit of slack innovation may not necessarily hold in the short run or ever (Abrahamson, 1996; Cyert & March, 1963). Thus, the adoption of HPWSs, the gain from which may not be achieved in the short run, could be an attempt of slack innovation for high performing firms.

In this regard, high-performing firms may also have motivation for organizational innovation including HR systems, and they may also be more likely to have knowledge and financial resources for organizational innovations due to their success in performance. On the other hand, HPWS adoption could be a possible solution for the performance problem of low-performing firms, but they are less likely to have absorptive capacity for HPWSs and financial resources for the HR investment due to the very performance problem. Therefore, the current study suggests firm performance as a predictor of HPWS adoption and examines,

Hypothesis 2: Firm performance will increase HPWSs' utilization.

Moderation of Prior Level of HPWSs in Firm Performance-HPWSs Relationship

When HPWSs and firm performance positively affect each other simultaneously, the co-evolutionary relationship would result in a virtuous cycle (Combs et al., 2006); that is, when HPWSs result in higher firm performance, the resulting higher performance may increase the level of HPWS adoption, and, again, the increased level of HPWSs may bring additional increases in firm performance. In the phase of reinvestment in HPWSs, firms already utilizing HPWSs to a relatively higher degree may reinvest in HPWSs more.

Firms, in general, may have preferences for exploitation to exploration in their adaptive behaviors (March, 2008); initiation of HR system innovation may be perceived as exploratory attempt of managerial improvement by firms, but when the firms harvest returns from their prior investments in the HR system innovations, or, at least, psychologically and erroneously perceive gains from the prior investments, they may begin to consider committing to the HR system innovation as an opportunity of exploitation. Firms already utilizing HPWSs to a relatively higher degree may have achieved greater performance enhancement. In addition, attribution theory (see: Kelley & Michela, 1980) implies that firms may be more likely to attribute the performance enhancement to HPWS utilization, regardless of the substantive performance gains from the investments, when significant amount of resources were already invested; the event of prior investments in HPWSs may become more salient as the cumulated amount of organizational resources invested in HPWSs increases, and firms may find the cause of performance gains in the salient investment event. Moreover, the attribution of success could also be influenced by the expectations of the firms investing their resources in HPWSs. The amount of resources already invested in HPWSs may reflect a firm's high expectation of

performance gains from the investment, or the increased amount of the sunk cost may induce a firm to overstate the expected gains from the investment (Arkes & Blumer, 1985). When expectation of gains from investments is high, firms may be more likely to attribute the gains to the investments.

Therefore, firms already utilizing HPWSs to a relatively higher degree may have perceived gains from the prior investment, substantively or psychologically, and may increase the size of reinvestment in HPWSs to exploit the opportunity of firm performance gains, more than the others. Thus,

Hypothesis 3: Firm performance will increase HPWS utilization more,
when the contemporary level of HPWS utilization is higher.

METHODS

Data

Data for the empirical analysis of the current study were gathered from the Human Capital Corporate Panel (HCCP) of the Korea Research Institute for Vocational Education (KRIVET) and Training and from the Korea Investors Service (KIS). The HCCP database has corporation-level data from HR and business strategy managers (management survey) and individual-level data from employees (workforce survey), both of which were collected through biannual surveys that started in 2005. In addition, the KIS database provides financial accounting information on the firms contained in the HCCP database, from 1995 to 2009. Although the names of the companies included in both the HCCP database and KIS database were not disclosed, the national research institute, KRIVET, coded identification numbers for the firms in

the two databases, allowing merging the databases and controlling firm level fixed effect in analyses.

The current study utilizes the management survey of the HCCP database. The management survey of the HCCP database includes items on human resource management and human resource development practices, business strategy, and other management related information of corporations. In addition, the current study uses only the second and the third waves of the HCCP database, collected in 2007 and 2009, respectively; although the biannual surveys for the HCCP database were started in 2005, there was a significant change in the survey items between the first wave and the second wave, and, therefore, the current study does not use the first wave of HCCP data.

By a structurally randomized sampling process, the first wave survey of the HCCP database generated a nationwide representative sample of 454 companies that had hired 100 or more employees by the end of fiscal year 2004, across various industries in Korea. The second wave data were collected from 467 firms, in 2007, and the third wave data were collected from 473 firms, in 2009; the sample sizes were increased through the second and third wave surveys, since some firms in the first wave and the second wave data refused to participate in the next waves of the panel survey at the beginning but participated later, while other firms were added into the samples to replace the firms that initially refused to participate in the next wave surveys.

In the second and the third wave surveys, 358 firms participated in both waves; among the 467 firms in the second wave data, 27 firms closed business, 38 firms were excluded due to their change in business type or trade, and 44 firms refused to participate in the third wave survey. Among the 358 firms that remained in the panel data for the third wave, 225 firms were

included in the final sample utilized for the current study after excluding the firms having incomplete information in the two waves of the HCCP data and the KIS data.

To check against the possibility of sampling bias, a probit regression was conducted with the 358 firms in the original panel data, and found no statistically significant impact from firm size, firm age, industry, whether a firm is a sub-contractor or not, and whether there is any foreign ownership or not, on the propensity to be included in the final sample of 225 firms. Although the indifferences of the limited list of firm characteristics does not rule out the possibility of sampling bias, they increase the confidence that sampling bias does not threaten the validities of the results in the current study.

Measures

Principal variables

Firm performance. Firm performance variable was utilized as a dependent variable and a control variable in the examination of hypothesis 1, and as an independent variable in the examinations of hypotheses 2 and 3. For the firm performance variables, one operational firm performance measure and three financial firm performance measures were utilized, separately, in the current study. The operational firm performance was measured by *labor productivity*, which was calculated by the logarithm of the ratio of total sales to total number of employees (Datta et al., 2005; Guthrie, 2001). The three financial firm performance measures used are *return on asset* (ROA) (e.g. Berman, Wicks, Kotha, & Jones, 1999; Delery & Doty, 1996; Guthrie & Datta, 2010), *return on equity* (ROE) (e.g. Delery & Doty, 1996; Lepak, Takeuchi, & Snell, 2003) and *return on sales* (ROS) (e.g. Endo & Ozaki, 2010; Qian, Li, Li, & Qian, 2008; Tallman & Li, 1996). The financial measures were directly obtained from the KIS data.

High Performance Work System (HPWS). High Performance Work System scales were generated and utilized as an independent variable in the examination of hypothesis 1 and as a dependent variable and a control variable in the examinations of hypotheses 2 and 3. HPWS scales were generated by utilizing items from the HCCP data. Recent reviews (e.g. Arthur & Boyles, 2007; Lepak et al., 2006) suggested that HR programs or HR policies, rather than specific individual HR practices, are more appropriate levels of measurement for HPWS scale generation. In addition, Arthur and Boyles (2007) commented that objective measures of HR policies or HR programs could be obtained through direct observation or archival company records, and used, if accessible. The current study utilized survey items on company records asked to HR managers in the management survey of the HCCP data, to construct the HPWS scale. Based on prior literature (Guthrie, 2001; Lawler, Chen, Wu, Bae, & Bai, 2010; Lepak et al., 2006; Pfeffer, 1998; Wu et al., 2011), ten items related to extensive selection and training, intensive appraisal and pay-for-performance, and employee participation and opportunity were directly selected or generated by calculations from the survey items. First, the following items relating to selection and training were utilized: average length in days for staffing, average training cost per employee, average training cost per new hire, and average length in days for new hire training. Second, the following items relating to compensation and appraisal were utilized: performance appraisal intensity, competence appraisal intensity, average ratio of incentive pay to base pay, and number of incentive pay programs. Third, the following items relating to employee participation were utilized: job rotation intensity and employee participation program intensity. Since different HR systems could be applied to different groups of workforces within a firm (Lepak & Snell, 1999), the current study primarily utilized items exclusively relevant to fulltime white collar workers; however, the study also included three items that may

be applicable to all the fulltime workers, and therefore, were used as proxy measures. This was done due to the fact that the nature of the data set did not allow for differentiation between blue and white collar workers. The three items are average training cost per employee, job rotation intensity and employee participation program intensity. For further clarification of items for HPWS scales, please refer to the Appendix A.

The results of exploratory factor analyses (EFAs) of HPWS scales of fiscal year 2006 (HPWS 2006) and fiscal year 2008 (HPWS 2008) are presented in Table 2.1 and 2.2, and the results of confirmatory factor analyses (CFAs) of HPWS scales of the two fiscal years are provided in Figure 2.1. First, EFA of the HPWS 2006 scale and EFA of the HPWS 2008 scale were conducted separately to uncover the underlying factor structures of each HPWS scale. As seen in Table 2.1 and 2.2, the measured variables selected for HPWS 2006 and HPWS 2008 loaded into three factors in each analysis, with factor loadings larger than 0.30 (Sun et al., 2007); the current study named each of the three factors as "Ability," "Motivation," and "Opportunity," respectively, considering that the HR policies loading on the factors were related to employee ability attainment and development, employee motivation enhancement, and opportunities for employee involvement (Lepak et al., 2006). The extraction method was principal axis factoring and the rotation method was oblimin rotation with Kaiser normalization, considering the possibility that those three extracted factors would load again into another higher order latent construct, named as "High Performance Work System" (Beltrán-Martín, Roca-Puig, Escrig-Tena, & Bou-Llusar, 2008; Camps & Luna-Arocas, 2012; Gong, Chang, & Cheung, 2010); EFAs were conducted, again, with the three factors, Ability, Motivation, and Opportunity, which were generated by aggregating the measured HR policy variables loading into the factors, respectively, and the three factors loaded into one factor, as shown in Table 2.1 and 2.2.

Second, CFAs for HPWS 2006 and HPWS 2008 were conducted through the multiple group analysis method of AMOS 20.0, which fits multiple models with various assumptions on factor structures into multiple groups of data, simultaneously, and allows examining invariability of factor structures among the multiple groups of data. As shown in Figure 2.1, second-order CFA models were fitted into the variables for HPWS 2006 and HPWS 2008, simultaneously, with variant constraints on the regression weights in the factor structure. In the model with no constraints on the regression weights of HPWS 2006 and HPWS 2008, various CFA goodness-of-fit criteria supported the second-order one factor model ($\chi^2 = 90.302$, d.f. = 64, $\chi^2 / \text{d.f.} = 1.411$, GFI=0.963, AGFI=0.936, CFI=0.958, RMSEA=0.030), and all the regression weights were significant ($P < 0.05$) in the factor structures of HPWS 2006 and HPWS 2008. In addition, in the model with the constraint that the measurement regression weights and the structural regression weights of HPWS 2006 and HPWS 2008 are equal, various CFA goodness-of-fit criteria also supported the second-order one factor model ($\chi^2 = 95.934$, d.f. = 73, $\chi^2 / \text{d.f.} = 1.314$, GFI=0.960, AGFI=0.940, CFI=0.963, RMSEA=0.026), and all the regression weights were significant ($P \leq 0.001$) in the factor structures of HPWS 2006 and HPWS 2008 models. To test factor structure noninvariance between HPWS 2006 and HPWS 2008, χ^2 and CFI between the unconstrained and constrained models were compared; $\Delta\chi^2$ was 5.633 with degree of freedom 9 and, thus, the difference was not significant ($p = 0.776$), meaning that the factor structures of HPWS 2006 and HPWS 2008 are invariant. In addition, ΔCFI was 0.005 and met the invariance criteria requiring ΔCFI smaller than 0.01. Thus, the CFA results supported invariance of factor structures between HPWS 2006 and HPWS 2008.

Based on the results of EFAs and CFAs, the current study constructed HPWS scales by aggregating the selected ten HR policy measures. Since the items on company records are

measured in various units and scales, all the measures were standardized before being aggregated to generate HPWS scales. The alpha reliability of HPWS 2006 was 0.69, not deviating much from the generally accepted criterion of 0.7, and the alpha of HPWS 2008 was 0.70.

Control Variables

Firm size, firm age, and union density were controlled in the analyses since these have been suggested as variables associated with firm performance and also with use of HPWSs (Guthrie, 2001). Two firm size variables were measured by *total number of employees* and *total asset*. However, the two firm size measures were highly inter-correlated ($\rho = 0.84$ in 2006 and $\rho = 0.87$ in 2008) and either one of the measures was utilized as control variable in each analysis. When firm performance was measured by ROE or ROA, and they were used as dependent variables in analyses, total number of employees was used as a measure of firm size, since ROA is a function of net income and total asset, and ROE is a function of net income and shareholder's equity, which is a part of total asset (ρ of total asset and shareholder's equity = 0.95 in 2006 and 2008). Likewise, when firm performance was measured by labor productivity, total asset was used as a measure of firm size, since labor productivity is a function of total sales and total number of employees. For all other analyses models, total asset was used as a measure of firm size. In addition, firm age was measured by the number of years of a firm's operation, and union density was calculated by the ratio of the number of union members to the total number of employees.

Second, *differentiation strategy* and *the differentiation strategy \times HPWS interaction* were included as control variables. Differentiation strategy is a dummy variable indicating whether a firm primarily pursues a differentiation strategy (new product development or product quality

improvement) or an overall cost leadership strategy (Porter, 1980). In addition, the interaction term was included as a control variable since HPWSs may work differently depending on the firm strategy (Wu et al., 2011; Yalabik, Chen, Lawler, & Kim, 2008).

Third, *ratio of export to total sales and product demand change from 2007 to 2008* were used to control impacts of domestic and foreign market environments on firm performance and possible influences on use of HPWSs; in addition, firms engaging in exporting may have more chances to be influenced by global trends in human resource management through their contacts with foreign buyers and could be exposed more frequently to HPWSs than other firms focusing on the Korean domestic market. Ratio of export to total sales was measured by directly asking with a six point scale item ranging "0%," "<10%," "<30%," "<50%," "<70%," and "<100%." Product demand change from 2007 to 2008 was also measured by asking strategy managers with a five point scale item ranging from "Decreased very much" to "Increased very much."

Fourth, *change in organizational structure from 2007 to 2008* was added as a control to rule out the possible influence of organizational structural change on firm performance and propensity of investment on HPWSs. The variable was measured by a four-point scale item ranging from "Almost no change" to "Extensive change."

Finally, *industries* were controlled by dummy variables for the industrial categories; the industrial categories are manufacturing, media and IT service, financial service, and other service industries. For several models, *indicators for each firm* were included to control firm level fixed effect, instead of the industry variables. In addition, an *indicator of fiscal year* was also included in the models controlling firm fixed effect.

Analysis

To examine direction of causal order between HPWSs and firm performance, the current study will utilize a *cross lagged effect model* (Finkel, 1995; Rogosa, 1980) with the two waves of HCCP survey data, as delineated in Figure 2.2; equations (1.1), (2.1), and (3.1) in Figure 2.2 express hypotheses 1, 2, and 3, respectively. The two year lag existing between the two waves of survey provides a unique opportunity for examining possible reciprocal causality, which cannot be captured and may inflate the impact sizes of the predictor variables on the dependent variables, in cross sectional models. In addition, Huselid and Becker (1996) maintained that there may be a time lag between the level of HR systems and subsequent effect on firm performance. Their indirect examination of the time dependency of HR systems' impact reported greater impacts of HR systems on firm performance in the following first and second year than on contemporaneous firm performance; further, the size of impact on firm performance was the greatest in the one-year-lagged model, among contemporaneous, one-year-lagged and two-year-lagged models (Huselid & Becker, 1996). Therefore, a two-year-lagged panel model may estimate the impact of HPWSs on firm performance in a valid but conservative way.

As shown by equations (1.1) and (2.1) in Figure 2.2, which assume non-intercept models for simplified expressions, a *cross lagged effect model* contains two *conditional change panel models* in opposite directions: the prediction of HPWSs on the subsequent level of firm performance with the control of the contemporaneous level of firm performance, and vice versa. In addition, equations (1.2) and (2.2) in Figure 2.2. are additional expressions of equations (1.1) and (2.1), generated by simply subtracting the control variables from both the left and right sides of equations (1.1) and (2.1), respectively. Equations (1.2) and (2.2) explain that the *conditional change panel models* estimate the impacts of the main predictor variables on the *changes* in the dependent variables over time, independently from the impacts of the current values of

dependent variables on the *changes* in the dependent variables. This unique feature of the *conditional change panel models* overcomes the critical limitation of the *first difference panel model*, often referred to as *difference-difference panel model*, which requires the assumption that the lagged value of a dependent variable does not have any influence on either the subsequent value of a dependent variable or the *change* in a dependent variable (see: Finkel, 1995). In addition, the *first difference panel model* also requires the assumption of unidirectional causality due to the aforementioned reasons for the cross sectional models.

RESULTS

Table 2.3 provides the summary statistics and the correlation matrix of the variables utilized in the current study. While the sample includes 225 firms, 75 % of the firms were drawn from the manufacturing industry; however, no significant difference of industry composition between the original HCCP data and the sample of the current study was found. Interestingly, among the four industrial categories (manufacturing, media & IT service, financial service, and other service), the positive correlations with HPWS scales were observed in the financial service industry, meaning that financial firms utilized HPWSs more extensively than the firms in the other industries.

Regarding the principal variables of the current study, two notable points were observed. First, deep and sudden drops in mean values of all the financial performance measures were observed in 2008, while the mean values of productivity were very stable across fiscal years; ROE dived from 4.30 to 0.08, ROA dropped from 3.73 to 1.45, and ROS fell from 3.84 to 1.93, in 2008. In addition, while productivity measures were substantially and consistently correlated with each other across fiscal years, the correlations between each year's financial performance

measures were relatively low, and they fall quickly as the time lag between the measures increases, except in the case of ROE 2006. These observations may imply that financial performance is more vulnerable to the influences of the economic environment such as the U.S. subprime mortgage crisis of late 2007 to 2008, and the influences of prior financial performances disappear relatively quickly, thus allowing larger variability.

Second, the correlations between productivity measures and financial performance measures ranged from 0.02 to 0.29, mostly closer to the lower bound, and the correlations between HPWS scales and productivity variables were at least twice as large as the correlations between HPWS scales and financial performance measures, thus implying that the financial performance may be a more distal organizational outcome of human resource management, compared with productivity (Huselid, 1995).

The OLS regression results are reported in the tables from Table 2.4 to Table 2.11. As presented in the previous section on analysis strategy and in Figure 2.2, the current study utilizes cross lagged effect models involving separate regressions for testing each direction of causality between principal variables. First, the analysis results for the causality from HPWSs to various dimensions of firm performance are presented from Table 2.4 to Table 2.7. Each of the tables provides the results of the eight different OLS regression models, to demonstrate changes of the estimated impact sizes of HPWSs across the models. In Models 1,2, and 3, HPWS 2006 regressed on each of firm performance in 2006, 2007, and 2008, without controlling of firm performance in 2006. The most of the prior empirical studies examining the HPWSs-firm performance relationship utilized one of these models, and the aforementioned study of Huselid and Backer (1996) compared the impact sizes of HPWSs on firm performance in three different time lagged models, similar to Models 1, 2, and 3. In Models 4 and 5, control variables for the

changes in product markets and organizational structure during the time lags between HPWS 2006 and the subsequent firm performance were added into the preceding one-year-lagged (Model 2) and two-year-lagged (Model 3) models. While Models 1, 2, 3, 4, and 5 do not control the time-lagged dependent variables as the most of the models in the prior studies, in Models 6 and 7, the time lagged dependent variables, firm performance variables in 2006, were added as control variables into the preceding Models 4, and 5, in order to examine the causal impact of HPWS 2006 on firm performances in the following first and second year. Finally, in Model 8, firm performance regressed on the one-year-lagged HPWSs and the one-year-lagged firm performance with control of firm fixed effect, in order to examine the causal impact of HPWSs on the firm performance in one year with controlling of the influence of unobserved firm characteristics. The current study could not utilize measures of firm performance in 2010, and thus, controlling of firm fixed effect was only possible in the one-year-lagged models.

Second, the analysis results for the causality from firm performance to HPWSs and the hypothesized interaction effect are provided from Table 2.8 to Table 2.11. Each of the tables provides the results of the three different OLS regression models. In Model 1, HPWS 2008 regressed on firm performance in 2006. Then, in Model 2, HPWS 2008 regressed on firm performance in 2006 and HPWS 2006, in order to examine the causal impact of firm performance on HPWS utilization in two years. Finally, in Model 3, interaction between firm performance and HPWSs were added into Model 2, to examine the moderation of the lagged level of HPWS utilization in the performance-HPWS utilization relationship. Since the current study could utilize only HPWS 2006 and HPWS2008 from the biannual survey data, one-year-lagged models for the causality from performance to HPWS utilization could not be examined.

Impact of HPWSs on Firm Performance

Hypothesis 1 proposed that HPWSs will increase firm performance. Each analysis result for the causal relationship between HPWSs and productivity, ROS, ROE, and ROA is presented from Table 2.4 to Table 2.7, respectively, and eight different regression models are presented in each of the tables. First, Table 2.4 provides the analysis results for the relationship between HPWSs and productivity. In Models 1, 2, and 3, productivity in 2006, 2007 and 2008 regressed on HPWSs in 2006 without controlling market demand change and organizational structural change during the time lag between HPWS utilization and productivity outcome, similar to the majority of prior studies. The results of the three models reported the highly significant associations between HPWSs and productivity ($p < 0.001$), but the magnitude varied; the coefficient of HPWSs was the highest in the one-year-lagged model (Model 2), the second highest in the two-year-lagged model (Model 3), and the lowest in the contemporaneous model (Model 1), consistent with the findings of Huselid and Becker (1996). In addition, the adjusted R^2 increased as the time lag between HPWSs and productivity increased. In Models 4 and 5, the controls for the market demand change and organizational structural change were added into Models 2 and 3, and the magnitudes of the associations between HPWSs and productivity increased slightly. In Models 6 and 7, productivity in 2006 was included as a control variable in order to examine causal impact of HPWSs on productivity rather than the associations between them. The coefficients of HPWSs were significant ($p < 0.001$, $p < 0.01$) in both models, and the magnitude was higher in the one-year-lagged model (Model 6) than in the two-year-lagged model (Model 7). Compared with the coefficients of the previous models in which the lagged productivity was not controlled, the magnitudes of the coefficients of HPWSs in Models 6 and 7 were relatively very small, while the coefficients of the lagged productivity were statistically

significant ($p < 0.001$) and considerably larger, suggesting that the impact of HPWSs on productivity was overstated in the previous models that did not rule out the stability effect of productivity; furthermore, the impact size of the lagged productivity was also significantly larger than that of HPWSs in both Models 6 and 7, and the adjusted R^2 surged considerably when the lagged productivity was included as an additional control, thus suggesting that the level of the lagged productivity explains a much greater portion of the variation in future productivity than the level of the lagged HPWS utilization. In Model 8, indicators of each firm and the fiscal year for the productivity measures were added as controls in order to rule out the possible influences of unobserved and stable firm characteristics such as other management policies, overall managerial ability and talent of the top management, organizational culture (Becker & Huselid, 2006; Huselid & Becker, 1997), and time specific factors on the relationship between HPWSs and productivity. The coefficient of the one-year-lagged HPWSs ($HPWS_t$) on the productivity in the following year ($Productivity_{t+1}$) in Model 8 was significant ($P < 0.05$) but the magnitude was slightly smaller than the coefficient in Model 6. In addition, the impact of the one-year-lagged productivity also decreased substantially after controlling firm fixed and time fixed effects. An interesting finding worth noting is that the coefficient for interaction between HPWSs and differentiation strategy were negative across the models, and significant in Models 6, 7, and 8, deviated from theoretical anticipation. Although the interaction term was included as control variable and the test results of the interaction effect were inconclusive in prior studies, the significant and negative interaction between HPWSs and differentiation strategy requires caution in the interpreting the causal impact of HPWSs on productivity. In Models 6 and 7, the results implies that HPWSs will increase productivity across firms, although the magnitude will be reduced in case a firm utilizes differentiation strategy; it is because the absolute value of the

coefficient for HPWSs is larger than that for the HPWSs-differentiation strategy interaction term. However, in Model 8, the result means that HPWSs will increase productivity in case a firm utilizes cost leadership strategy, but that HPWSs will decrease productivity in case a firm utilizes differentiation strategy. In sum, all the results in the models except Model 8 were consistent with the expectations of the current study and the results of Models 6 and 7 supported Hypothesis 1 proposing the positive causal impact of HPWSs on firm performance. However, the result of Model 8 only partially supported Hypothesis 1.

Second, Table 2.5 presents the results of the analyses on the relationship between HPWSs and ROS; the eight analysis models used previously were utilized again, changing only the performance measure from productivity to ROS. All the coefficients of HPWSs were significant, at least, at 5% significance level, except Model 1, the contemporaneous model, and the magnitude consistently increased as the time lag between HPWSs and ROS increased, across the models. Similar to the result of the productivity model, however, Model 8 showed that HPWSs will increase ROS in a year only when a firm utilizes cost leadership strategy. Further, the partial impact of the lagged ROS was significant ($p < 0.001$) in Model 6, the one-year-lagged model, but the impact disappeared in Model 7, the two-year-lagged model. In addition, the adjusted R^2 sizes were considerably smaller than the analyses with productivity measures, across the models, implying that ROS may be a more distal organizational outcome influenced by HPWS utilization than productivity. In sum, the results of Models 6 and 7 supported Hypothesis 1, and the result of Model 8 partially supported the hypothesis.

Third, Table 2.6 provides the results of the analyses conducted with ROE. The coefficients of HPWSs were significant only in Models 2, 4, 6, and 8, the one-year-lagged-models; even the overall model fits were satisfactory only in those models. Interestingly, the

negative effect of interaction between HPWSs and differentiation strategy was not found in the causal models (Models 6 and 8). In addition, the adjusted R^2 sizes were also considerably smaller than the results for productivity, similar to the results for ROS. An interesting fact worth noting from Models 6 and 8 is that the impact of the one-year-lagged ROE on the following year's ROE was negative ($p < 0.001$) rather than positive, suggesting that the impact of HPWSs on ROE estimated without controlling the lagged value of ROE may be biased downward rather than upward; the coefficient for HPWSs in Model 4, which did not control the lagged value of ROE, was smaller than the coefficient in Model 6, which included the lagged ROE measure. In sum, the results of Models 6 and 8, the one-year-lagged models, supported the hypothesized causal impact of HPWSs on firm performance, but the two-year-lagged model (Model 7) did not provide support.

Finally, Table 2.7 presents the analysis results for the relationship between HPWSs and ROA. While the results were fairly similar to the results in the analyses on ROE, across the models examined, there was no significant impact of HPWSs on ROA when the lagged ROA values were controlled in Models 6, 7, and 8; however, the coefficients for HPWSs were positive. In addition, different from ROE, the impact of the lagged ROA values on the following year's ROA values was statistically significant ($p < 0.001$) and positive in Models 6, 7, and 8, resulting in the reduced magnitude of the coefficients for HPWSs when the control was added. In sum, the current study did not find support for Hypothesis 1 in the analyses on HPWSs and ROA.

In summary, Hypothesis 1 was partially supported; however, the most of the analyses with various firm performance measures provided supporting results. The analyses on productivity and ROS provided support for Hypothesis 1 in both the one-year lagged and the two-year lagged models without firm fixed effect control, and partial support in fixed effect

models. The analyses on ROE returned supporting results only in the one-year lagged models. However, the examination with ROA did not provide any statistically significant support for Hypothesis 1's proposition of the causal impact of HPWSs on firm performance.

Impact of Firm Performance on HPWSs and Moderation of Prior Level of HPWSs

In Hypothesis 2 and 3, it was proposed that firm performance will increase HPWS utilization, and that firm performance will increase HPWS utilization more, when the contemporary level of HPWS utilization is higher. Tables 2.8, 2.9, 2.10, and 2.11 provide the results of analyses examining Hypotheses 2 and 3, with productivity, ROS, ROE and ROA as firm performance measures, respectively. Model 1 and 2 examine Hypothesis 2, with and without controlling the two year-lagged value of HPWSs, and Model 3 tests Hypothesis 3.

First, Table 2.8 presents the analysis results for the relationship between productivity and HPWSs. Model 1 and Model 2 showed significant ($p < 0.001$, $p < 0.05$) associations between productivity in 2006 and HPWSs in 2008; however, the size of the coefficient for productivity decreased when HPWSs in 2006 were added as a control in Model 2. In addition, the two-year-lagged value of HPWSs had a statistically significant and relatively high impact on HPWS 2008, compared with the two-year-lagged productivity. In sum, the results of Model 2 supported Hypothesis 2's proposition of the causal impact of firm performance on HPWS utilization.

In Model 3, the interaction term of the productivity 2006 and HPWS 2006 was included to test Hypothesis 3; however, the coefficient of the interaction variable was not significant. Thus, the result did not support Hypothesis 3.

While the analysis on the causal relationship between productivity and HPWSs provided supports for Hypothesis 2, the results of the analyses conducted with ROS, ROE and ROA did

not provide any support for Hypothesis 2, as well as Hypothesis 3, as shown in Table 2.9, 2.10, and 2.11. Rather, the results only showed that the two-year-lagged value of HPWSs had significant and considerably sized coefficients ($\beta > 0.63$, $p < 0.001$) across models. Thus, in summary, only Hypothesis 2 was partially supported and Hypothesis 3 was not supported.

DISCUSSION AND CONCLUSION

In the past decades, extensive research on the relationship between HPWSs and firm performance has been conducted, returning only evidence of positive associations between them, but the causal directions of the positive associations have not been revealed, resulting in skepticism about the efficacy of HPWSs (e.g. Guest et al., 2003; Kaufman, 2012). Thus, the current study focused on investigating the unrevealed causal mechanisms residing beneath the co-variation between HPWSs and firm performance. Given the positive association, one of three possibilities may hold; either or both of HPWSs and firm performance may result in the other. Rather than claiming only one direction of causality within the theoretical frame of the prior SHRM literature, the current study also proposed the opposite direction of causality, which would result in a co-evolutionary relationship between HPWSs and firm performance, drawing from multiple perspectives in organizational studies. Then, the current study also proposed the moderating role of the lagged level of HPWSs in the causal relationship between the lagged firm performance and HPWSs.

The results of the tests are mixed, depending on the type of firm performance measures, in general. First, in examination of the causal relationship between HPWSs and firm performance, the models on productivity and ROS showed generally positive result, and the ROE models provided mixed results. however, the ROA models provided negative results.

Second, in examination of the causal relationship between firm performance and HPWS utilization, only the productivity model provided a positive result. However, all the models did not provided results supporting Hypothesis 3's proposition of the moderating role of the lagged level of HPWSs in the firm performance - HPWSs relationship, consistently.

Impact of HPWSs on Firm Performance

The test results of the causality from HPWSs to firm performance showed that greater use of HPWSs resulted in higher productivity and ROS. In addition, HPWSs resulted in enhanced ROE one year later. However, the causal relationship was not found in the two-year-lagged model with ROE, and in all the time-lagged models with ROA. Although many prior studies have reported positive associations between HPWSs and financial performance (Combs et al., 2006), and ROE and ROA are two of the widely utilized measurements for financial performance in the prior studies, the mixed or negative results of the current study are not surprising, since what the current study tested was not the covariations between HPWSs and financial performance as prior studies examined, but the causal relationship between HPWSs and financial performance with the control of the lagged value of financial performance. To the best of the author's knowledge, only two other studies or, at most a few more, have examined the causal relations between HR systems and financial performance in similar ways, but the results were inconclusive; Guest and his colleagues (2003) reported that there was no significant relationship between high use of HR practices and profit per employee when previous performance was controlled, in their study on 366 British companies. In addition, Razouk (2011)'s study on French firms showed that the positive relationship between HPWSs and

subjective measure of profitability in the same fiscal year was significant when seven-year-lagged measure of profitability was controlled.

Furthermore, the mixed or negative results of ROE and ROA models are consistent with the perspective that the financial performance may be a distal organizational outcome to which the impact of HPWSs are delivered via a chain of operational performances (Dyer & Reeves, 1995; Huselid, 1995). Moreover, the sudden and deep collapse of mean values of ROE (from 7.30 to 0.08) and ROA (from 3.73 to 1.45) in 2008, the climax period of the U.S. subprime mortgage crisis, implies that these accounting measures of financial performance may be much more related to influencing factors other than effectiveness of human resource management, such as embedded economic environment.

In addition, the current study found positive associations between HPWSs and the subsequent ROE and ROA in the one-year-lagged models without controlling for the lagged dependent variables (Models 2 and 4 in Tables 2.6 and 2.7), consistent with the prior studies. Thus, the mixed and negative results of the causality models may not necessarily mean inconsistency with prior research results.

In contrast to the ROE and the ROA models, the ROS models provided positive results supporting the causal relationship between HPWSs and ROS, as in the productivity models. Although the decrease of the sample mean of ROS in 2008 (from 3.84 in 2007 to 1.93 in 2008) was also observed in Table 2.3, the difference in ROS between 2007 and 2008 was relatively small compared with the changes in mean value of ROE (from 7.30 to 0.08) and ROA (from 3.73 to 1.45). In addition, compared with the mean value of ROS in 2006 (2.33), the possible influence of the global financial crisis in 2008 on the mean value of ROS in 2008 may be smaller than the other accounting measures of financial performance, thus implying that ROS may be a

more proximal performance measure in the relationship between HPWSs and firm performance than ROE and ROA.

The positive results from the analyses on productivity, ROS and ROE contributes to SHRM literature by providing evidence supporting the claim that HPWSs actually result in the enhancement of operational and financial firm performances, the arguable belief of HR researchers and practitioners. In addition, the results of the productivity models showed that the prior analyses without the control of the lagged value of the dependent variable, thus assessments of associations rather than causations, provided upward biased estimations of the coefficients of HPWSs. In Table 2.4, providing various models of the relationship between HPWSs and productivity, the coefficients of HPWSs decreased when the lagged value of productivity was controlled; the coefficients in Models 1,2, 3, 4 and 5 were 0.360, 0.492, 0.402,0.510, and 0.420, respectively, while the coefficients in Models 6, 7, and 8 were 0.187, 0.116, and 0.115, respectively. The invariability tests of the coefficients showed that all the coefficients in Models 1,2,3,4 and 5 were invariant ($\chi^2(4)=3.29$, $p=0.51$, H_0 : invariant) and that the coefficients in Models 6, 7 and 8 were invariant ($\chi^2(2)=0.91$, $p=0.64$, H_0 : invariant), while the coefficients were statistically different between the two groups ($\chi^2(7)=16.33$, $p=0.02$, H_0 : invariant), meaning that the coefficients in the models with the control of the lagged value of productivity are smaller.

The invariance tests also provide an interesting implication regarding the time lag between HPWSs and firm performance. While there has been no direct examination of the time length for the full realization of HPWSs' impact on firm performance, and Huselid and Becker(1996) predicted more conservative estimations of HPWSs' impact on financial firm performances in two- year- lagged-models than in one-year-lagged-models, the findings of the

invariance of the coefficients between the one-year lagged and the two- year- lagged models provides indirect evidence that using the two-year-lagged model may not result in a smaller sized estimation of HPWSs' impact on productivity, and, thus, may not threaten the validity of the results on the relationship between HPWSs and productivity. In addition, the invariance of coefficients between the one-year-lagged and the two-lagged models was also found in the ROS models; the coefficient for HPWSs in all the models except Models 1 in Table 2.5 were compared all together and the test result supported invariance of the coefficients ($\chi^2(6)=4.38$, $p=0.63$, H_0 : invariant). Thus, using the two-year-lagged models in the examination of the relationship between HPWSs and ROS, as well as productivity, may not threaten the validity of the results.

Even more, the invariance of the coefficient for HPWSs between each of Models 6, 7, and 8 mentioned above also means that there was no significant difference in the estimations of the HPWSs' impact between the causal relationship models with and without the control of firm level fixed effect, in the analyses of the HPWSs-productivity relationship and the HPWSs-ROS relationship.

Based on these findings, the current study calls for future research that would allow direct examination of the time dependency of the HPWSs' impact and comparison of the estimated HPWSs' impact across various model specifications, for more comprehensive and generalizable understanding on the relationship between HPWSs and firm performance.

Impact of Firm Performance on HPWS Utilization

As shown in Tables 2.8, 2.9, 2.10 and 2.11, productivity predicted an increase of HPWS utilization in two fiscal years, while all the financial performance measures did not. The current

study submitted that firms having enough organizational slack resources, which may accrue from the success of business, will invest more in HPWSs than firms without the resources; however, the negative results, especially from the models testing the impact of financial performance on HPWS utilization, deviate a great deal from the anticipated result.

If the argument that the organizational slack resources come from the profitability of a firm (Cyert & March, 1963) is correct, and if both operational and financial measurements are related to the profitability of a firm, the mixed results may suggest that there may be unrevealed mechanisms on which the relationship between firm performance and investment in HPWSs is contingent, such as the political power of HR function in the organizational decision making process for resource allocation.

Pfeffer and Salancik described organizations as "markets for influence and control" (2003: 27), where organizational participants having their own interests and claims may struggle for resources. Even when a firm achieved slack resources from its successful performance, as reflected in the various performance measures, the resources could be allocated only to the functional areas that may successfully account for their own contributions to the firm performance, rather than to HR function. Although productivity, ROS, ROE, and ROA are all measures related to firm performance, each of the measures accounts for different aspects of the organizational outcome; while productivity may be a measure reflecting how efficiently HR function managed overall workforces of a firm, the other measures may largely mirror the efficiency of top management and/or other functional units such as finance and marketing departments, who are responsible for the management of equity, assets, and strategy, on profit margins. Thus, if productivity, measured by sales per employee, works as a basis for evaluating HR function's own performance, while the accounting measures of firm performance do not,

only the achievement of a high level of productivity among the various firm performance measures may support HR function's claim for slack resources in the intra-organizational competition for resources. In addition, claiming resources by organizational participants may require greater accountability under an unfavorable economic environment (Cyert & March, 1963), and HR managers may be pressed more to present evidence of HR function's contribution and efficiency, such as achievement of high productivity, in order to achieve resources or avoid withdrawing of allocated resources, during an economic recession period (Barney & Wright, 1998) such as fiscal year 2008.

In this regard, a possible reason for the difference in results between the productivity models and the other models of accounting measures could be that productivity reflects organizational performance and the performance of HR function, while the other measures only capture firm performance without capturing HR function's performance. As an indirect test of this argument, the current study conducted additional analyses by adding productivity as moderating variables into the models on the causal relationship between the accounting measures of performance and HPWS utilization (Model 2 of Tables 2.9, 2.10 and 2.11), and found positive coefficients for the interaction between ROE and productivity ($\beta=0.155$, $p<0.1$), and ROA and productivity ($\beta=0.087$, $p<0.1$), meaning that ROE or ROA increases HPWS utilization more when productivity is higher. However, this is only one of the possible explanations for the mixed results on the causal relationship between firm performance and HPWS utilization, and even the suggested interaction effect was not found in the ROS model. Thus, future research for a more comprehensive understanding of the mechanism through which firm performance and/or organizational resources affect HPWSs and more rigorous model specification are needed.

Notwithstanding the negative results from the financial performance models, the current study contributes to SHRM literature by providing evidence of causality from productivity to HPWS utilization, which has been suggested by a growing number of researchers (e.g. Combs et al., 2006; Guest et al., 2003; Wright et al., 2005) with only limited empirical evidence, if any.

As shown in Models 1 and 2 of Table 2.8, the two-year-lagged productivity predicted HPWS utilization but the coefficient of the predictor decreased significantly ($\chi^2(1)=18.26$, $p < 0.001$, H_0 : coefficients are invariant) when the two-year-lagged level of HPWS utilization was controlled, meaning that the result of Model 1 is upward biased. More importantly, as shown in the ROS and ROA models (Tables 2.9 and 2.11), omitting the lagged value of a dependent variable may return misleading results in the analysis of causal relationship; although the coefficients of ROS and ROA were not significant when the lagged dependent variables were controlled in Tables 2.9 and 2.11, the coefficients were significant (beta=0.11, $p < 0.1$ for ROS, and beta=0.13, $p < 0.05$ for ROA) in models that did not include the lagged value of dependent variable, HPWS utilization. Thus, a number of prior attempts, if not none, at examining the causal direction from firm performance to HPWS utilization by comparing bivariate correlations among past firm performance, current HPWS utilization, and post firm performance or by using regression models without control of the lagged dependent variable, did not provide reliable evidence of causality (Rogosa, 1980), making the current study one of the pioneering research projects providing evidence of the causal relationship between firm performance and HPWS utilization.

The evidence supporting the causal relationship between productivity and firm performance, given the finding of simultaneous causality from HPWSs to productivity, provides an explanation for the reason why HPWSs could fail to be widely adopted across firms in spite

of their claimed efficacy in firm performance (Blasi & Kruse, 2006; Boxall & Macky, 2009; Freeman & Rogers, 1999; Ichniowski et al., 1996; Kauhanen, 2009); while the prior research focusing on only one of the possible causal directions could not provide an answer to the paradoxical question, the finding of the reciprocal causality in the current study allows the argument that while HPWSs have substantive efficacy in firm performance, only the firms that understand this and are able to afford the investment in HPWSs can adopt and utilize HPWSs extensively.

Impact of Prior Level of HPWSs on Firm Performance-HPWSs Relationship

The current study also submitted that the degree of additional reinvestment on HPWSs from the prior success in performance may be higher when the level of already enacted HPWS is higher. However, the test results did not support the hypothesis.

One possible explanation for the non significant moderation of the lagged level of HPWS utilization in the causal relationship between the lagged firm performance and HPWS utilization may be that firms fail to perceive and attribute performance gains from HPWSs to HPWSs, since it may not be a feasible task for HR managers to account for the impact of their enacted HPWSs on their firm performance, especially in monetary terms (Barney & Wright, 1998). The current study argued that the size of additional investment in HPWSs may be influenced by the prior experience of the HR investment, and a firm that had already enacted a higher level of HPWSs might have experienced a performance gain from the enacted HPWSs or have attributed performance gains to prior HR investments, subjectively, thus making them likely to reinvest in HPWSs to a larger degree than would other firms. However, if firms tend to fail in relating their

achieved firm performance to their HR systems, additional investment in HPWSs based on the prior experience of investment in HPWSs may not hold.

Another possible explanation may be that there could be another simultaneous mechanism of influence from the lagged level of HPWS utilization, which may nullify the hypothesized positive moderating effect. A firm may decrease the amount of additional investment in HPWSs as its current level of HPWS utilization increase, anticipating the diminishing marginal return of investment in HPWSs (Kaufman, 2010b; Mas-Colell, Whinston, & Green, 1995). That is, if there exist an optimal level of HPWS utilization where firm performance cannot increase anymore by an additional investment in HPWSs, or if the organizational decision makers believe the existence of the ceiling, the investment in HPWSs could be discouraged as the current level of HPWS increases.

Thus, the findings of the current study calls for future research endeavors which would uncover the mechanisms in organizational decision making on HR system adoption and clarify the influence of prior level of HPWS utilization, based on multiple theoretical lenses.

Impact of Prior Level of Firm Performance on HPWSs-Firm Performance Relationship

In addition to the possible influence of prior level of HPWS utilization on the causal relationship between firm performance and HPWS utilization, it may be also possible that prior level of firm performance moderates the causal relationship between HPWS utilization and firm performance. For instance, prior level of firm performance may reflect certain types of organizational competence related to firm performance or HR system implementation, and may moderate the causal relationship between HPWSs and firm performance in a positive way. When a given level of HPWSs is utilized, currently high performing firms that may have high level of

organizational competence may achieve greater performance gains from the given level of HPWS utilization than low performing firms that may have low level of organizational competence. On the other hand, it is also possible that high performing firms that already have high level of organizational competence may not have much room for improving organizational competence by utilizing HPWSs, while low performing firms have much room for competence improvement, thus being able to achieve greater marginal gains from HPWS utilization than high performing firms. However, the suggested possibilities also could not be captured when firm fixed effect is controlled, simply because the organizational competence that were suggested to be reflected in the prior level of firm performance could be controlled by the firm indicators for firm fixed effect control.

Although no specific hypothesis was proposed, the current study conducted additional analyses on the moderating influence of prior level of firm performance, by adding the interactions of HPWSs and firm performance into the causal models of HPWSs and firm performance, as shown in Table 2.12. Parallel to the causal models presented in Models 6, 7, and 8 of Tables 2.4, 2.5, 2.6, and 2.7, the moderation effect was examined in one-year-lagged and two-year-lagged models without control of firm fixed effect, and, then, assessed in one-year-lagged models with control of firm fixed effect, for productivity, ROS, ROE and ROA. First, Model 1, 2, and 3 of Table 2.12 shows that there was no significant influence of prior level of productivity on the HPWSs-productivity relationship across models. Second, Model 4, 5, and 6 of Table 2.12 shows that prior level of ROS had positive impact on HPWSs-ROS relationship when firm fixed effect was not controlled (Models 4 and 5), but the positive moderation effect disappeared when firm fixed was controlled (Model 6). Third, Model 7, 8, and 9 of Table 2.12 shows that prior level of ROE had positive impact on HPWSs-ROE relationship in the one-year-

lagged model without control of firm fixed effect (Model 7), but there was no significant moderation effect in the other models (Models 8 and 9). Finally, Model 10, 11, and 12 of Table 2.12 shows that prior level of ROA had positive impact on HPWSs-ROA relationship when firm fixed effect was not controlled (Models 10 and 11), but had negative impact on the relationship when firm fixed effect was controlled (Model 12).

In sum, the findings of the tests are mixed. While no moderating effect was found in productivity models, some models for ROS, ROE, and ROA returned significant moderating effects. When firm fixed effect was not controlled, prior firm performance moderated HPWSs-performance relationship in a positive way in ROS and ROA models, regardless of the variation in time lag between HPWSs and firm performance (Models 4, 5, 10, and 11). Although the two-year-lagged model for ROE (Model 8) did not find significant moderating effect, the one-year-lagged model for ROE (Model 7) also found positive moderating impact of prior level of firm performance. Considering the sudden and deep drop of ROE in 2008 that was previously mentioned as one of possible reasons for the null effect in the two-year-lagged ROE model (Model 8), the findings were generally consistent across the different time-lagged models. When firm fixed effect was controlled (Models 3, 6, 9, and 12), however, no moderating effect was found across models, except in ROA model (Model 12), which showed significant and negative moderation of prior level of firm performance contradicting the findings of the other ROA models (Models 10 and 11).

Thus, the mixed findings call for future research that would suggest more comprehensive and clear theoretical models for the moderating impact of prior firm performance, and examine the moderating mechanism across operational and accounting performance models, and across different time lagged models, with and without controlling firm fixed effect. More importantly,

however, future research including direct measures of organizational competence and/or more of firm characteristics would allow examining the moderating impact of organizational competence on HPWSs- performance relationship in more rigorous ways, and also provide the opportunity of assessing process model of HPWSs-firm performance relationship mediated by organizational competence.

Implications for HR Managers and Top Management

The findings of the current study also provide practical insights for managerial decision makers as well as HR practitioners. First, the current study provided evidence that human resource management actually contribute to firm performance across industries, and thus investing in HR system innovation is a worthy choice. Although the effect size may vary depending on choice of firm strategy, increasing use of HPWSs by one standard deviation could increase productivity by 0.12 of a standard deviation, ROS by 0.13 of a standard deviation, and ROE by 0.18 of a standard deviation, in a fiscal year.

In addition, the study showed that while the use of HPWSs increases firm performance, a firm performing better invests more in HPWSs. The result implies that high performing firms will keep increasing their performance to a greater degree through repeated vicious cycles of performance enhancement and reinvestment in HPWSs, and, therefore, the performance difference between high performing firms and low performing firms will only grow as time goes on. Thus, the higher the market competition and the lower the firm performance, the more likely investment in HR systems is the correct solution for survival rather than cutting the budget for the HR department.

Limitations and Future Research

The current study has various limitations. First, the examination of the causality between firm performance and HPWS utilization is not free from the possibility of omitted variable bias, which would occur when an unobserved variable is associated with both the firm performance and HPWS utilization. While the test of the causal relationship between HPWSs and firm performance could be conducted with the control of firm level fixed effect, the two waves of panel data did not allow using the fixed effect model in the examination of the causal relationship between firm performance and HPWS utilization. If there are unobserved factors that positively affect both firm performance and HPWS utilization, the validity of the causal relationship between productivity and firm performance could be threatened. Thus, future research with more waves of panel data and more rigorous model specification would overcome the threat of omitted variable bias.

Second, while the current study is one of pioneering research providing evidence of reciprocal causality between HPWSs and firm performance, the study examined only the direct link between the two variables rather than the process models suggested by the supporting theories. Future research developing and utilizing direct measures of the constructs involved in the process models between HPWSs and firm performance, such as the measure of organizational slack resources, would advance the SHRM literature.

Finally, although a growing amount of research in the field of human resource studies has accumulated evidence supporting the invariance of study results between studies conducted in the U.S. and those in other countries (e.g. Bae et al., 2003; Bae & Lawler, 2000; Guthrie, 2001; Razouk, 2011; Sun et al., 2007; Takeuchi et al., 2007; Wu et al., 2011), the findings of the current study conducted in the context of the Korean economy may not be applicable to other

national contexts. More studies examining causal directions between HPWSs and firm performance in various national contexts would enhance our understanding of the causality between HPWSs and firm performance as well as the generalizability of the relationship.

Conclusion

Despite these limitations, the current study provided evidence of reciprocal causality between HPWSs and firm performance. As one of the earliest attempts at uncovering causal directions between HPWSs and firm performance, the current study showed that use of HPWSs results in enhanced productivity, ROS, and ROE, and that productivity results in greater use of HPWSs simultaneously, by the examination of a national representative sample of Korean firms of various sizes and industries. Drawing from diverse theories and perspectives from multiple disciplines in the fields of human resources and organizational studies, the current study provided evidence for reconciling the concerns raised by each side of the debates on the efficacy of HPWSs in firm performance, and a rationale for unraveling the paradox of nonproliferation of HPWSs, which could not be found in a single theoretical lens. The finding of a simultaneous and reciprocal causality between HPWSs and firm performance advanced the SHRM literature from studies on associations to studies on causations, and will facilitate insightful future research based on the co-evolutionary framework.

TABLES

Table 2.1: Exploratory Factor Analyses for High Performance Work System Scale 2006

Variables	First Order*			Second Order	
	Factor 1 (Ability)	Factor 2 (Motivation)	Factor 3 (Opportunity)	Latent Variables	Factor 1
Avg. Length in Days for Staffing	0.73	0.11	-0.01	Ability	0.50
Avg. Training Cost per Employee	0.58	0.25	-0.21		
Avg. Training Cost per New Hire	0.72	-0.13	0.08		
Avg. Length in Days for New Hire Training	0.51	-0.04	0.23		
Performance Appraisal Intensity	0.09	0.64	-0.10	Motivation	0.50
Competence Appraisal Intensity	-0.05	0.45	0.03		
Avg. Ratio of Incentive Pay to Base Pay	0.04	0.32	0.06		
Num. of Incentive Pay Programs	-0.01	0.51	0.10		
Job Rotation Intensity	-0.04	0.17	0.39	Opportunity	0.48
Employee Participation Program Intensity	0.15	0.02	0.53		
Eigenvalue	2.77	1.48	1.14		1.49
Percentage of variance	27.70	14.76	11.40		49.59

Bold indicates that the variable loads into the corresponding factor.

Extraction Method: Principal Axis Factoring.

* Rotation Method: Oblimin with Kaiser Normalization.

Table 2.2: Exploratory Factor Analyses for High Performance Work System Scale 2008

Variables	First Order*			Second Order	
	Factor 1 (Ability)	Factor 2 (Motivation)	Factor 3 (Opportunity)	Latent Variables	Factor 1
Avg. Length in Days for Staffing	0.60	0.03	-0.02	Ability	0.54
Avg. Training Cost per Employee	0.40	0.05	-0.03		
Avg. Training Cost per New Hire	0.75	-0.07	0.04		
Avg. Length in Days for New Hire Training	0.55	0.02	0.06		
Performance Appraisal Intensity	0.08	0.79	-0.13	Motivation	0.52
Competence Appraisal Intensity	0.00	0.56	0.16		
Avg. Ratio of Incentive Pay to Base Pay	0.02	0.33	-0.02		
Num. of Incentive Pay Programs	-0.02	0.46	0.06		
Job Rotation Intensity	0.15	-0.08	0.61	Opportunity	0.47
Employee Participation Program Intensity	-0.06	0.13	0.53		
Eigenvalue	2.77	1.42	1.14		1.52
Percentage of variance	27.71	14.17	11.43		50.72

Bold indicates that the variable loads into the corresponding factor.

Extraction Method: Principal Axis Factoring.

* Rotation Method: Oblimin with Kaiser Normalization.

Table 2.3: Descriptive Statistics and Correlations

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Productivity 2009 ^a	13.00	0.86	1.00																
2. Productivity 2008 ^a	12.98	0.86	0.95	1.00															
3. Productivity 2007 ^a	12.83	0.86	0.90	0.93	1.00														
4. Productivity 2006 ^a	12.73	0.81	0.85	0.90	0.90	1.00													
5. ROS 2009	3.26	19.06	0.12	0.08	0.12	0.06	1.00												
6. ROS 2008	1.93	19.58	0.17	0.15	0.29	0.12	0.53	1.00											
7. ROS 2007	3.84	10.84	0.12	0.13	0.18	0.15	0.26	0.34	1.00										
8. ROS 2006	2.33	21.68	0.11	0.05	0.05	0.16	0.04	0.16	0.33	1.00									
9. ROE 2009	4.19	42.64	0.14	0.11	0.07	0.09	0.78	0.18	0.13	0.05	1.00								
10. ROE 2008	0.08	28.53	0.11	0.12	0.12	0.14	0.34	0.59	0.34	0.15	0.24	1.00							
11. ROE 2007	7.30	20.00	0.10	0.12	0.13	0.11	0.27	0.23	0.62	0.18	0.23	0.44	1.00						
12. ROE 2006	2.33	51.44	0.05	0.04	0.06	0.10	0.16	0.09	-0.01	0.34	0.15	0.12	-0.24	1.00					
13. ROA 2009	3.41	11.12	0.14	0.09	0.08	0.08	0.82	0.32	0.27	0.10	0.86	0.35	0.29	0.09	1.00				
14. ROA 2008	1.45	12.11	0.11	0.12	0.13	0.15	0.40	0.70	0.39	0.22	0.22	0.85	0.35	0.13	0.43	1.00			
15. ROA 2007	3.73	7.74	0.03	0.05	0.09	0.04	0.26	0.30	0.80	0.25	0.17	0.41	0.83	-0.22	0.35	0.47	1.00		
16. ROA 2006	3.27	12.05	0.08	0.02	0.02	0.10	0.12	0.15	0.30	0.91	0.11	0.17	0.25	0.37	0.16	0.25	0.36	1.00	
17. HPWS 2008	0.88	4.97	0.40	0.41	0.39	0.41	0.09	0.10	0.16	0.15	0.16	0.14	0.19	-0.01	0.13	0.10	0.11	0.11	1.00
18. HPWS 2006	1.65	4.87	0.46	0.44	0.46	0.43	0.09	0.22	0.24	0.22	0.07	0.13	0.13	0.12	0.08	0.11	0.09	0.16	0.73
19. Differentiation Strategy 2008 ^b	0.70	0.46	0.01	-0.01	0.02	0.02	0.02	0.08	0.06	0.17	0.07	0.09	0.10	0.11	0.04	0.11	0.03	0.17	0.09
20. Differentiation Strategy 2006 ^b	0.72	0.45	-0.09	-0.07	-0.05	0.00	-0.06	-0.09	0.06	0.01	0.01	-0.02	0.10	-0.07	-0.01	-0.01	0.08	-0.03	0.10
21. Firm Age 2006	29.34	16.90	0.14	0.13	0.14	0.13	0.08	0.14	0.10	0.05	0.03	0.11	0.10	-0.05	0.04	0.10	0.08	-0.03	0.15
22. Total Num. Employees 2008	893.18	2195.68	0.24	0.26	0.23	0.20	0.05	0.12	0.12	0.08	0.04	0.10	0.10	0.06	0.00	0.04	0.00	0.01	0.39
23. Total Num. Employees 2006	883.80	2174.17	0.24	0.25	0.22	0.19	0.04	0.12	0.12	0.09	0.03	0.11	0.11	0.06	-0.01	0.04	0.01	0.02	0.40
24. Total Asset 2008	3.27 Bn.	21.20 Bn.	0.22	0.26	0.19	0.19	0.00	0.02	0.10	0.06	0.01	0.06	0.07	0.04	-0.03	0.00	-0.04	-0.02	0.28
25. Total Asset 2006	2.36 Bn.	15.60 Bn.	0.21	0.25	0.19	0.19	0.00	0.02	0.09	0.06	0.01	0.06	0.07	0.04	-0.03	0.00	-0.04	-0.02	0.28
26. Union Density 2008	0.24	0.29	0.23	0.26	0.24	0.25	0.06	0.04	0.12	0.07	0.05	0.16	0.20	0.03	0.04	0.12	0.11	0.03	0.15
27. Union Density 2006	0.25	0.29	0.26	0.30	0.27	0.28	0.06	0.04	0.12	0.07	0.04	0.18	0.22	0.02	0.04	0.14	0.14	0.05	0.15
28. Export in Total Sales 2008	3.06	1.63	0.03	0.04	0.01	0.00	0.11	-0.04	-0.12	-0.09	0.10	-0.08	-0.09	0.04	0.12	-0.02	-0.10	-0.08	-0.09
29. Export in Total Sales 2006	3.00	1.62	0.03	0.04	0.01	-0.03	-0.03	-0.06	-0.16	-0.17	-0.05	-0.12	-0.16	-0.02	0.00	-0.05	-0.15	-0.17	-0.08
30. Product Demand Change 2007-2008	3.16	1.04	0.21	0.17	0.14	0.09	0.07	0.06	-0.08	-0.01	0.18	0.02	-0.03	0.05	0.13	0.03	-0.06	0.00	0.04
31. Org. Structure Change 2007-2008	2.69	0.81	0.12	0.05	0.05	0.05	-0.01	0.07	0.09	0.12	0.07	0.05	0.08	-0.03	0.04	0.02	0.06	0.12	0.23
32. Manufacturing ^b	0.75	0.43	-0.02	-0.03	-0.06	-0.04	0.00	-0.12	-0.03	-0.08	0.03	-0.10	-0.07	-0.12	0.07	0.00	0.05	-0.06	-0.03
33. Media & IT Service ^b	0.11	0.31	-0.09	-0.08	-0.05	-0.05	-0.04	-0.05	-0.10	-0.03	0.01	-0.03	-0.07	0.03	-0.01	-0.09	-0.08	-0.01	-0.04
34. Financial Service ^b	0.07	0.26	0.38	0.38	0.33	0.35	0.02	0.05	0.15	0.12	0.03	0.11	0.14	0.09	-0.06	0.00	-0.07	-0.02	0.28
35. Other Service ^b	0.07	0.25	-0.24	-0.23	-0.17	-0.23	0.03	0.22	0.03	0.06	-0.09	0.10	0.06	0.09	-0.04	0.11	0.09	0.13	-0.19

Note: N=225. Bn. =Billion Korean Won. a. = Natural logarithm. b.=Dummy variable.

Table 2.3 (Cont.)

Variable	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.	34.	35.
1. Productivity 2009																		
2. Productivity 2008																		
3. Productivity 2007																		
4. Productivity 2006																		
5. ROS 2009																		
6. ROS 2008																		
7. ROS 2007																		
8. ROS 2006																		
9. ROE 2009																		
10. ROE 2008																		
11. ROE 2007																		
12. ROE 2006																		
13. ROA 2009																		
14. ROA 2008																		
15. ROA 2007																		
16. ROA 2006																		
17. HPWS 2008																		
18. HPWS 2006	1.00																	
19. Differentiation Strategy 2008	0.14	1.00																
20. Differentiation Strategy 2006	0.12	0.34	1.00															
21. Firm Age 2006	0.14	-0.02	0.02	1.00														
22. Total Num. Employees 2008	0.42	0.03	-0.02	0.20	1.00													
23. Total Num. Employees 2006	0.41	0.01	-0.03	0.19	0.98	1.00												
24. Total Asset 2008	0.31	0.07	0.00	0.11	0.87	0.85	1.00											
25. Total Asset 2006	0.30	0.08	0.01	0.11	0.86	0.84	1.00	1.00										
26. Union Density 2008	0.16	-0.01	0.02	0.35	0.25	0.25	0.21	0.20	1.00									
27. Union Density 2006	0.18	0.01	0.01	0.35	0.21	0.19	0.18	0.18	0.95	1.00								
28. Export in Total Sales 2008	-0.13	-0.04	-0.15	-0.09	-0.07	-0.04	-0.15	-0.16	-0.08	-0.10	1.00							
29. Export in Total Sales 2006	-0.11	-0.05	-0.18	-0.15	-0.04	-0.01	-0.12	-0.12	-0.15	-0.17	0.89	1.00						
30. Product Demand Change 2007-2008	0.02	0.06	0.02	0.07	0.08	0.08	0.05	0.06	-0.01	0.01	0.17	0.14	1.00					
31. Org. Structure Change 2007-2008	0.25	0.25	0.05	-0.05	0.07	0.05	0.04	0.03	-0.05	-0.03	-0.08	-0.09	0.18	1.00				
32. Manufacturing	-0.15	-0.18	-0.11	0.23	-0.14	-0.12	-0.22	-0.22	0.04	0.02	0.52	0.52	0.03	-0.09	1.00			
33. Media & IT Service	0.00	0.11	0.09	-0.33	-0.09	-0.10	-0.05	-0.11	-0.10	-0.10	-0.24	-0.25	0.01	0.08	-0.61	1.00		
34. Financial Service	0.37	0.14	0.13	0.06	0.37	0.34	0.47	0.24	0.24	0.26	-0.34	-0.32	0.04	0.09	-0.48	-0.10	1.00	
35. Other Service	-0.13	0.02	-0.07	-0.05	-0.02	-0.03	-0.04	-0.04	-0.17	-0.16	-0.25	-0.25	-0.11	-0.03	-0.46	-0.09	-0.07	1.00

Note: N=225. Bn. =Billion Korean Won. a. = Natural logarithm. b.=Dummy variable.

Table 2.4: Regression Results in the Relationship between HPWSs and Productivity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) ^c
DV: Productivity ^b of Fiscal Year :	2006	2007	2008	2007	2008	2007	2008	t+1
HPWS 2006 (t) ^{a, b, c}	0.360*** (0.098)	0.492*** (0.098)	0.402*** (0.092)	0.510*** (0.099)	0.420*** (0.092)	0.187*** (0.051)	0.116** (0.047)	0.115* (0.056)
Differentiation Strategy 2006, (t) ^c (STG)	-0.166 (0.132)	-0.281* (0.131)	-0.310* (0.123)	-0.289* (0.131)	-0.319** (0.122)	-0.143* (0.066)	-0.181** (0.060)	0.002 (0.055)
HPWS 2006 (t) × STG 2006 (t) ^c	-0.050 (0.124)	-0.190 (0.124)	-0.151 (0.116)	-0.186 (0.123)	-0.148 (0.115)	-0.146* (0.062)	-0.110+ (0.056)	-0.133* (0.058)
Export in Total Sales 2006 (t) ^c	0.030 (0.044)	0.075+ (0.044)	0.083* (0.041)	0.056 (0.045)	0.062 (0.042)	0.041+ (0.022)	0.047* (0.021)	0.029 (0.037)
Total Asset 2006 (t) ^c	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Union Density 2006 (t) ^c	0.512* (0.219)	0.510* (0.218)	0.531* (0.205)	0.508* (0.218)	0.532** (0.204)	0.073 (0.110)	0.123 (0.101)	0.029 (0.302)
Firm Age	0.001 (0.004)	0.004 (0.004)	0.002 (0.004)	0.003 (0.004)	0.000 (0.004)	0.002 (0.002)	0.000 (0.002)	
Media & IT Service	-0.012 (0.214)	0.116 (0.213)	0.025 (0.200)	0.078 (0.213)	-0.020 (0.199)	0.105 (0.107)	0.006 (0.098)	
Financial Service	0.862** (0.291)	0.929** (0.290)	1.045*** (0.272)	0.877** (0.290)	0.985*** (0.271)	0.164 (0.148)	0.314* (0.135)	
Other Service	-0.560* (0.255)	-0.235 (0.255)	-0.478* (0.239)	-0.227 (0.253)	-0.467* (0.237)	0.253+ (0.128)	-0.016 (0.118)	
Product Demand Change from 2007 to 2008				0.110+ (0.057)	0.128* (0.053)	0.056+ (0.029)	0.077** (0.026)	
Change in Organizational Structure from 2007 to 2008				-0.077 (0.074)	-0.070 (0.070)	-0.013 (0.037)	-0.010 (0.034)	
Productivity 2006 (t) ^{b, c}						0.859*** (0.041)	0.808*** (0.038)	0.356*** (0.066)
Firm Fixed Effect								Yes
Year Effect								Yes
Constant	-0.138 (0.261)	-0.303 (0.260)	-0.234 (0.244)	-0.334 (0.350)	-0.329 (0.327)	-13.529*** (0.552)	-12.740*** (0.506)	-0.463+ (0.243)
Observations	225	225	225	225	225	225	225	450 (225) ^d
Adjusted R ²	0.256	0.272	0.313	0.280	0.326	0.820	0.838	0.913
F	8.699***	9.384***	11.200***	8.242***	10.008***	79.286***	89.806***	21.206***

Note: Standard errors in parentheses. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

a. One tail test only for HPWS, and two tail test for the others. b. HPWS and Productivity were standardized.

c. For Model 8 which controls firm fixed effect, t=2006 and 2008. d. 225 firms were included in the analysis twice.

Table 2.5: Regression Results in the Relationship between HPWSs and Return on Sales (ROS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) ^c
DV: ROS ^b of Fiscal Year :	2006	2007	2008	2007	2008	2007	2008	t+1
HPWS 2006 (t) ^{a, b, c}	0.107 (0.095)	0.054* (0.025)	0.230*** (0.072)	0.050* (0.025)	0.228** (0.073)	0.044* (0.025)	0.221** (0.073)	0.131* (0.077)
Differentiation Strategy 2006, (t) ^c (STG)	-0.053 (0.127)	0.008 (0.034)	-0.157 (0.097)	0.009 (0.034)	-0.160+ (0.097)	0.013 (0.033)	-0.156 (0.097)	0.090 (0.074)
HPWS 2006 (t) × STG 2006 (t) ^c	0.145 (0.119)	-0.006 (0.032)	-0.096 (0.091)	-0.007 (0.032)	-0.096 (0.091)	-0.017 (0.031)	-0.107 (0.091)	-0.145+ (0.081)
Export in Total Sales 2006 (t) ^c	-0.090* (0.043)	-0.023* (0.011)	0.024 (0.033)	-0.020+ (0.012)	0.018 (0.033)	-0.014 (0.011)	0.025 (0.034)	0.273*** (0.050)
Total Asset 2006 (t) ^c	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
Union Density 2006 (t) ^c	0.078 (0.211)	0.041 (0.056)	0.017 (0.161)	0.042 (0.056)	0.025 (0.162)	0.035 (0.054)	0.018 (0.161)	0.133 (0.413)
Firm Age	-0.002 (0.004)	-0.000 (0.001)	0.006+ (0.003)	-0.000 (0.001)	0.005+ (0.003)	0.000 (0.001)	0.005+ (0.003)	
Media & IT Service	-0.212 (0.206)	-0.104+ (0.055)	0.094 (0.157)	-0.100+ (0.055)	0.076 (0.158)	-0.084 (0.053)	0.093 (0.158)	
Financial Service	-0.111 (0.280)	-0.004 (0.074)	0.115 (0.214)	0.003 (0.075)	0.096 (0.215)	0.011 (0.072)	0.104 (0.214)	
Other Service	0.156 (0.246)	0.004 (0.065)	0.707*** (0.188)	0.003 (0.066)	0.715*** (0.188)	-0.008 (0.063)	0.703*** (0.188)	
Product Demand Change from 2007 to 2008				-0.015 (0.015)	0.046 (0.042)	-0.015 (0.014)	0.045 (0.042)	
Change in Organizational Structure from 2007 to 2008				0.015 (0.019)	0.016 (0.055)	0.011 (0.019)	0.011 (0.055)	
ROS 2006 (t) ^{b, c}						0.072*** (0.018)	0.079 (0.052)	0.272*** (0.040)
Firm Fixed Effect								Yes
Year Effect								Yes
Constant	0.395 (0.252)	0.137* (0.067)	-0.137 (0.192)	0.126 (0.090)	-0.293 (0.260)	0.112 (0.087)	-0.308 (0.259)	-0.869** (0.330)
Observations	225	225	225	225	225	225	225	450 (225) ^d
Adjusted R ²	0.046	0.055	0.103	0.053	0.101	0.117	0.106	0.347
F	2.069*	2.316*	3.582***	2.035*	3.097***	3.292***	3.052***	2.027***

Note: Standard errors in parentheses. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

a. One tail test only for HPWS, and two tail test for the others. b. HPWS and ROS were standardized.

c. For Model 8 which controls firm fixed effect, t=2006 and 2008. d. 225 firms were included in the analysis twice.

Table 2.6: Regression Results in the Relationship between HPWSs and Return on Equity (ROE)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) ^c
DV: ROE ^b of Fiscal Year :	2006	2007	2008	2007	2008	2007	2008	t+1
HPWS 2006 (t) ^{a, b, c}	0.032 (0.129)	0.141* (0.077)	0.105 (0.108)	0.129+ (0.078)	0.100 (0.110)	0.138* (0.075)	0.096 (0.110)	0.177+ (0.120)
Differentiation Strategy 2006, (t) ^c (STG)	-0.162 (0.168)	0.091 (0.100)	-0.087 (0.140)	0.092 (0.100)	-0.089 (0.141)	0.065 (0.097)	-0.076 (0.141)	0.057 (0.119)
HPWS 2006 (t) × STG 2006 (t) ^c	0.160 (0.158)	-0.156+ (0.094)	-0.031 (0.132)	-0.158+ (0.094)	-0.032 (0.132)	-0.131 (0.091)	-0.045 (0.132)	-0.083 (0.126)
Export in Total Sales 2006 (t) ^c	0.032 (0.057)	-0.048 (0.034)	-0.026 (0.047)	-0.043 (0.035)	-0.027 (0.049)	-0.040 (0.033)	-0.029 (0.049)	0.207* (0.080)
Total Num. of Employees 2006 (t) ^c	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Union Density 2006 (t) ^c	0.135 (0.279)	0.422* (0.166)	0.465* (0.233)	0.429* (0.167)	0.472* (0.234)	0.450** (0.161)	0.463* (0.234)	0.858 (0.690)
Firm Age	-0.003 (0.005)	-0.001 (0.003)	0.002 (0.004)	-0.000 (0.003)	0.002 (0.004)	-0.001 (0.003)	0.003 (0.004)	
Media & IT Service	0.182 (0.271)	-0.173 (0.162)	0.028 (0.227)	-0.170 (0.163)	0.018 (0.229)	-0.144 (0.157)	0.005 (0.229)	
Financial Service	0.296 (0.351)	0.054 (0.209)	0.103 (0.294)	0.065 (0.211)	0.095 (0.297)	0.106 (0.204)	0.075 (0.296)	
Other Service	0.562+ (0.325)	0.145 (0.194)	0.458+ (0.272)	0.148 (0.194)	0.464+ (0.273)	0.238 (0.189)	0.420 (0.275)	
Product Demand Change from 2007 to 2008				-0.017 (0.044)	0.023 (0.061)	-0.005 (0.042)	0.017 (0.061)	
Change in Organizational Structure from 2007 to 2008				0.055 (0.057)	0.028 (0.080)	0.037 (0.055)	0.037 (0.080)	
ROE 2006 (t) ^{b, c}						-0.161*** (0.040)	0.077 (0.058)	-0.210*** (0.047)
Firm Fixed Effect								Yes
Year Effect								Yes
Constant	-0.021 (0.331)	0.074 (0.197)	-0.150 (0.277)	-0.050 (0.267)	-0.289 (0.376)	-0.028 (0.258)	-0.299 (0.375)	-0.632 (0.532)
Observations	225	225	225	225	225	225	225	450 (225) ^d
Adjusted R ²	-0.000	0.059	0.025	0.054	0.017	0.119	0.021	0.312
F	0.992	2.399*	1.563	2.072*	1.321	3.324***	1.362	1.876***

Note: Standard errors in parentheses. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

a. One tail test only for HPWS, and two tail test for the others. b. HPWS and ROE were standardized.

c. For Model 8 which controls firm fixed effect, t=2006 and 2008. d. 225 firms were included in the analysis twice.

Table 2.7: Regression Results in the Relationship between HPWSs and Return on Asset (ROA)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) ^c
DV: ROA ^b of Fiscal Year :	2006	2007	2008	2007	2008	2007	2008	t+1
HPWS 2006 (t) ^{a, b, c}	0.107 (0.110)	0.117+ (0.073)	0.100 (0.120)	0.110+ (0.074)	0.104 (0.122)	0.089 (0.071)	0.081 (0.119)	0.133 (0.125)
Differentiation Strategy 2006, (t) ^c (STG)	-0.086 (0.142)	0.096 (0.095)	-0.006 (0.156)	0.097 (0.095)	-0.011 (0.156)	0.116 (0.091)	0.010 (0.153)	0.157 (0.123)
HPWS 2006 (t) × STG 2006 (t) ^c	0.200 (0.134)	-0.050 (0.089)	0.075 (0.146)	-0.051 (0.090)	0.075 (0.147)	-0.094 (0.085)	0.029 (0.144)	-0.124 (0.129)
Export in Total Sales 2006 (t) ^c	-0.136** (0.048)	-0.083* (0.032)	-0.009 (0.053)	-0.080* (0.033)	-0.016 (0.054)	-0.050 (0.032)	0.017 (0.054)	0.267** (0.083)
Total Num. of Employees 2006 (t) ^c	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
Union Density 2006 (t) ^c	0.245 (0.237)	0.326* (0.158)	0.498+ (0.259)	0.330* (0.159)	0.504+ (0.260)	0.273+ (0.151)	0.442+ (0.255)	0.844 (0.711)
Firm Age	-0.008* (0.004)	-0.002 (0.003)	0.001 (0.005)	-0.002 (0.003)	0.001 (0.005)	-0.000 (0.003)	0.003 (0.005)	
Media & IT Service	-0.332 (0.230)	-0.325* (0.154)	-0.205 (0.252)	-0.321* (0.155)	-0.226 (0.254)	-0.245+ (0.148)	-0.142 (0.250)	
Financial Service	-0.759* (0.298)	-0.590** (0.199)	-0.363 (0.326)	-0.581** (0.201)	-0.386 (0.329)	-0.414* (0.193)	-0.204 (0.327)	
Other Service	0.318 (0.276)	0.099 (0.184)	0.573+ (0.302)	0.100 (0.185)	0.581+ (0.303)	0.028 (0.176)	0.503+ (0.298)	
Product Demand Change from 2007 to 2008				-0.015 (0.042)	0.053 (0.068)	-0.025 (0.039)	0.041 (0.067)	
Change in Organizational Structure from 2007 to 2008				0.034 (0.054)	-0.003 (0.089)	0.019 (0.051)	-0.019 (0.087)	
ROA 2006 (t) ^{b, c}						0.215*** (0.044)	0.235** (0.074)	0.160** (0.053)
Firm Fixed Effect								Yes
Year Effect								Yes
Constant	0.740** (0.281)	0.301 (0.188)	-0.131 (0.308)	0.236 (0.254)	-0.247 (0.417)	0.146 (0.242)	-0.346 (0.409)	-1.052+ (0.550)
Observations	225	225	225	225	225	225	225	450 (225) ^d
Adjusted R ²	0.070	0.058	0.016	0.051	0.010	0.145	0.051	0.358
F	2.680**	2.375*	1.375	2.002*	1.190	3.921***	1.931*	2.082***

Note: Standard errors in parentheses. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

a. One tail test only for HPWS, and two tail test for the others. b. HPWS and ROA were standardized.

c. For Model 8 which controls firm fixed effect, t=2006 and 2008. d. 225 firms were included in the analysis twice.

Table 2.8: Regression Results in the Relationship between Productivity and HPWSs

DV: HPWS 2008 ^b	(1)	(2)	(3)
Productivity 2006 ^{a b}	0.314*** (0.063)	0.107* (0.052)	0.112* (0.052)
Differentiation Strategy 2006	0.147 (0.127)	0.030 (0.099)	0.021 (0.099)
Total Asset 2006	0.005 (0.004)	0.001 (0.003)	0.001 (0.003)
Union Density 2006	0.000** (0.000)	0.000 (0.000)	0.000+ (0.000)
Export in Total Sales 2006	-0.119 (0.216)	-0.108 (0.168)	-0.100 (0.168)
Product Demand Change from 2007 to 2008	-0.014 (0.044)	-0.036 (0.034)	-0.033 (0.034)
Change in Organizational Structure from 2007 to 2008	-0.045 (0.056)	0.006 (0.044)	0.006 (0.043)
Firm Age	0.244*** (0.070)	0.065 (0.057)	0.066 (0.057)
Media & IT Service	-0.073 (0.209)	-0.215 (0.162)	-0.221 (0.162)
Financial Service	0.148 (0.282)	-0.295 (0.222)	-0.286 (0.222)
Other Service	-0.405 (0.250)	-0.395* (0.194)	-0.355+ (0.197)
HPWS 2006 ^b		0.637*** (0.054)	0.651*** (0.055)
Productivity 2006×HPWS 2006 ^a			-0.052 (0.045)
Constant	-0.735* (0.334)	-0.057 (0.266)	-0.045 (0.266)
Observations	225	225	225
Adjusted R ²	0.240	0.541	0.542
F	7.422***	23.010***	21.373***

Note: Standard errors in parentheses. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

a. One tail test only for Productivity 2006 and Productivity 2006×HPWS 2006. Two tail test for the others.

b. HPWS and Productivity were standardized.

Table 2.9: Regression Results in the Relationship between ROS and HPWSs

DV: HPWS 2008 ^b	(1)	(2)	(3)
ROS 2006 ^{a,b}	0.112+ (0.071)	-0.019 (0.054)	-0.124 (0.109)
Differentiation Strategy 2006	0.117 (0.133)	0.011 (0.100)	0.010 (0.100)
Total Asset 2006	0.006 (0.004)	0.001 (0.003)	0.001 (0.003)
Union Density 2006	0.000* (0.000)	0.000 (0.000)	0.000 (0.000)
Export in Total Sales 2006	0.047 (0.224)	-0.052 (0.167)	-0.062 (0.168)
Product Demand Change from 2007 to 2008	0.006 (0.046)	-0.036 (0.035)	-0.038 (0.035)
Change in Organizational Structure from 2007 to 2008	-0.032 (0.059)	0.013 (0.044)	0.017 (0.044)
Firm Age	0.239** (0.074)	0.058 (0.057)	0.058 (0.057)
Media & IT Service	-0.035 (0.219)	-0.222 (0.164)	-0.211 (0.165)
Financial Service	0.506+ (0.285)	-0.209 (0.220)	-0.144 (0.227)
Other Service	-0.611* (0.259)	-0.451* (0.194)	-0.444* (0.194)
HPWS 2006 ^b		0.678*** (0.052)	0.692*** (0.054)
ROS 2006×HPWS 2006 ^a			-0.121 (0.108)
Constant	-0.893* (0.350)	-0.060 (0.269)	-0.051 (0.269)
Observations	225	225	225
Adjusted R ²	0.160	0.532	0.533
F	4.891***	22.233***	20.642***

Note: Standard errors in parentheses. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

a. One tail test only for ROS 2006 and ROS 2006×HPWS 2006. Two tail test for the others.

b. HPWS and ROS were standardized.

Table 2.10: Regression Results in the Relationship between ROE and HPWSs

DV: HPWS 2008 ^b	(1)	(2)	(3)
ROE 2006 ^{a,b}	0.002 (0.055)	-0.067 (0.041)	-0.090 (0.055)
Differentiation Strategy 2006	0.112 (0.134)	-0.001 (0.099)	-0.001 (0.099)
Total Asset 2006	0.006 (0.004)	0.001 (0.003)	0.000 (0.003)
Union Density 2006	0.000* (0.000)	0.000 (0.000)	0.000 (0.000)
Export in Total Sales 2006	0.059 (0.225)	-0.046 (0.166)	-0.044 (0.167)
Product Demand Change from 2007 to 2008	-0.003 (0.046)	-0.033 (0.034)	-0.033 (0.034)
Change in Organizational Structure from 2007 to 2008	-0.033 (0.059)	0.018 (0.044)	0.019 (0.044)
Firm Age	0.252*** (0.075)	0.049 (0.057)	0.048 (0.057)
Media & IT Service	-0.056 (0.221)	-0.208 (0.163)	-0.205 (0.163)
Financial Service	0.520+ (0.288)	-0.185 (0.219)	-0.168 (0.221)
Other Service	-0.602* (0.262)	-0.418* (0.194)	-0.424* (0.194)
HPWS 2006 ^b		0.685*** (0.051)	0.687*** (0.051)
ROE 2006×HPWS 2006 ^a			-0.048 (0.076)
Constant	-0.893* (0.352)	-0.054 (0.267)	-0.048 (0.268)
Observations	225	225	225
Adjusted R ²	0.151	0.538	0.536
F	4.611***	22.718***	20.941***

Note: Standard errors in parentheses. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

a. One tail test only for ROE 2006 and ROE 2006×HPWS 2006. Two tail test for the others.

b. HPWS and ROE were standardized.

Table 2.11: Regression Results in the Relationship between ROA and HPWSs

DV: HPWS 2008 ^b	(1)	(2)	(3)
ROA 2006 ^{a,b}	0.125* (0.063)	0.000 (0.048)	0.028 (0.073)
Differentiation Strategy 2006	0.123 (0.133)	0.013 (0.100)	0.011 (0.100)
Total Asset 2006	0.007+ (0.004)	0.001 (0.003)	0.001 (0.003)
Union Density 2006	0.000** (0.000)	0.000 (0.000)	0.000 (0.000)
Export in Total Sales 2006	0.024 (0.224)	-0.053 (0.168)	-0.058 (0.168)
Product Demand Change from 2007 to 2008	0.014 (0.047)	-0.034 (0.035)	-0.032 (0.035)
Change in Organizational Structure from 2007 to 2008	-0.037 (0.058)	0.013 (0.044)	0.012 (0.044)
Firm Age	0.235** (0.074)	0.057 (0.057)	0.056 (0.057)
Media & IT Service	-0.017 (0.219)	-0.218 (0.165)	-0.221 (0.165)
Financial Service	0.577* (0.286)	-0.208 (0.222)	-0.194 (0.224)
Other Service	-0.631* (0.259)	-0.454* (0.194)	-0.449* (0.195)
HPWS 2006 ^b		0.675*** (0.052)	0.674*** (0.052)
ROA 2006×HPWS 2006 ^a			0.038 (0.075)
Constant	-0.915** (0.349)	-0.065 (0.270)	-0.068 (0.270)
Observations	225	225	225
Adjusted R ²	0.166	0.532	0.530
F	5.048***	22.210***	20.449***

Note: Standard errors in parentheses. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

a. One tail test only for ROA 2006 and ROA 2006×HPWS 2006. Two tail test for the others.

b. HPWS and ROA were standardized.

Table 2.12: HPWS and Lagged Firm Performance Interaction for Firm Performance

DV:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Productivity 2007	Productivity 2008	Productivity t+1	ROS 2007	ROS 2008	ROS t+1	ROE 2007	ROE 2008	ROE t+1	ROA 2007	ROA 2008	ROA t+1
Industry Fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed effect												
Year Effect			Yes			Yes			Yes			Yes
Firm Age	0.002 (0.002)	0.000 (0.002)	Yes	-0.000 (0.001)	0.005+ (0.003)	Yes	-0.001 (0.003)	0.003 (0.004)	Yes	0.003 (0.005)	0.000 (0.003)	0.000 (0.003)
Product Demand Change from 2007 to 2008	0.056+ (0.029)	0.077** (0.026)	Yes	-0.019 (0.014)	0.038 (0.042)	Yes	-0.008 (0.042)	0.015 (0.061)	Yes	0.032 (0.066)	-0.035 (0.038)	0.000 (0.038)
Change in Organizational Structure from 2007 to 2008	-0.013 (0.037)	-0.011 (0.034)		0.010 (0.018)	0.010 (0.054)		0.040 (0.055)	0.039 (0.080)		-0.025 (0.086)	0.013 (0.050)	0.000 (0.050)
Export in Total Sales 2006 (t) ^e	0.040+ (0.023)	0.046* (0.021)	0.029 (0.037)	-0.011 (0.011)	0.030 (0.033)	0.276*** (0.050)	-0.039 (0.033)	-0.028 (0.049)	0.198* (0.081)	0.026 (0.053)	-0.040 (0.031)	0.249** (0.083)
Firm Size 2006 (t) ^{c, d}	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Union Density 2006 (t) ^c	0.073 (0.111)	0.120 (0.101)	0.029 (0.304)	0.049 (0.052)	0.040 (0.159)	0.097 (0.416)	0.447** (0.159)	0.461+ (0.234)	0.840 (0.690)	0.415 (0.253)	0.244+ (0.146)	0.859 (0.707)
Differentiation Strategy 2006, (t) ^e (STG 2006)	-0.142* (0.066)	-0.177** (0.060)	0.002 (0.055)	0.015 (0.031)	-0.152 (0.096)	0.080 (0.075)	0.071 (0.096)	-0.072 (0.141)	0.062 (0.119)	0.001 (0.152)	0.106 (0.088)	0.184 (0.123)
HPWS 2006 (t) × STG 2006 (t) ^c	-0.146* (0.062)	-0.108+ (0.057)	-0.133* (0.059)	-0.012 (0.029)	-0.099 (0.090)	-0.149+ (0.081)	-0.109 (0.091)	-0.028 (0.133)	-0.086 (0.126)	0.026 (0.143)	-0.096 (0.083)	-0.126 (0.129)
HPWS 2006 (t) ^{a, b, c}	0.186*** (0.052)	0.108* (0.048)	0.115* (0.057)	0.022 (0.024)	0.185** (0.074)	0.140* (0.078)	0.122+ (0.075)	0.084 (0.110)	0.172* (0.121)	0.079 (0.118)	0.087 (0.068)	0.098 (0.125)
Productivity 2006 (t) ^{b, c}	0.859*** (0.034)	0.806*** (0.031)	0.356*** (0.066)									
HPWS06 (t) × Productivity06 (t) ^c	0.005 (0.030)	0.024 (0.027)	-0.001 (0.041)									
ROS 2006 (t) ^{b, c}				0.209*** (0.034)	0.306** (0.103)	0.299*** (0.055)						
HPWS06 (t) × ROS06 (t) ^c				0.158*** (0.033)	0.260* (0.103)	0.041 (0.057)						
ROE 2006 (t) ^{b, c}							-0.084 (0.052)	0.133+ (0.077)	-0.238*** (0.056)	0.410*** (0.110)	0.406*** (0.063)	0.064 (0.073)
HPWS06 (t) × ROE06 (t) ^c				0.163* (0.073)	0.260* (0.103)	0.041 (0.057)	0.163* (0.073)	0.119 (0.107)	-0.060 (0.069)	0.237* (0.112)	0.259*** (0.064)	-0.141+ (0.075)
ROA 2006 (t) ^{b, c}												
HPWS06 (t) × ROA06 (t) ^c												
Constant	-0.278 (0.176)	-0.280+ (0.161)	-0.463+ (0.244)	0.098 (0.083)	-0.330 (0.256)	-0.872** (0.330)	-0.052 (0.256)	-0.317 (0.376)	-0.594 (0.534)	-0.369 (0.406)	0.120 (0.234)	-0.981+ (0.548)
Observations	225	225	450 (225) ^f	225	225	450 (225) ^f	225	225	450 (225) ^f	225	225	450 (225) ^f
Adjusted R ²	0.819	0.837	0.912	0.198	0.129	0.345	0.135	0.022	0.311	0.067	0.202	0.366
F	73.284***	83.348***	21.018***	4.959***	3.367***	2.016***	3.503***	1.354	1.869***	2.145*	5.057***	2.112***

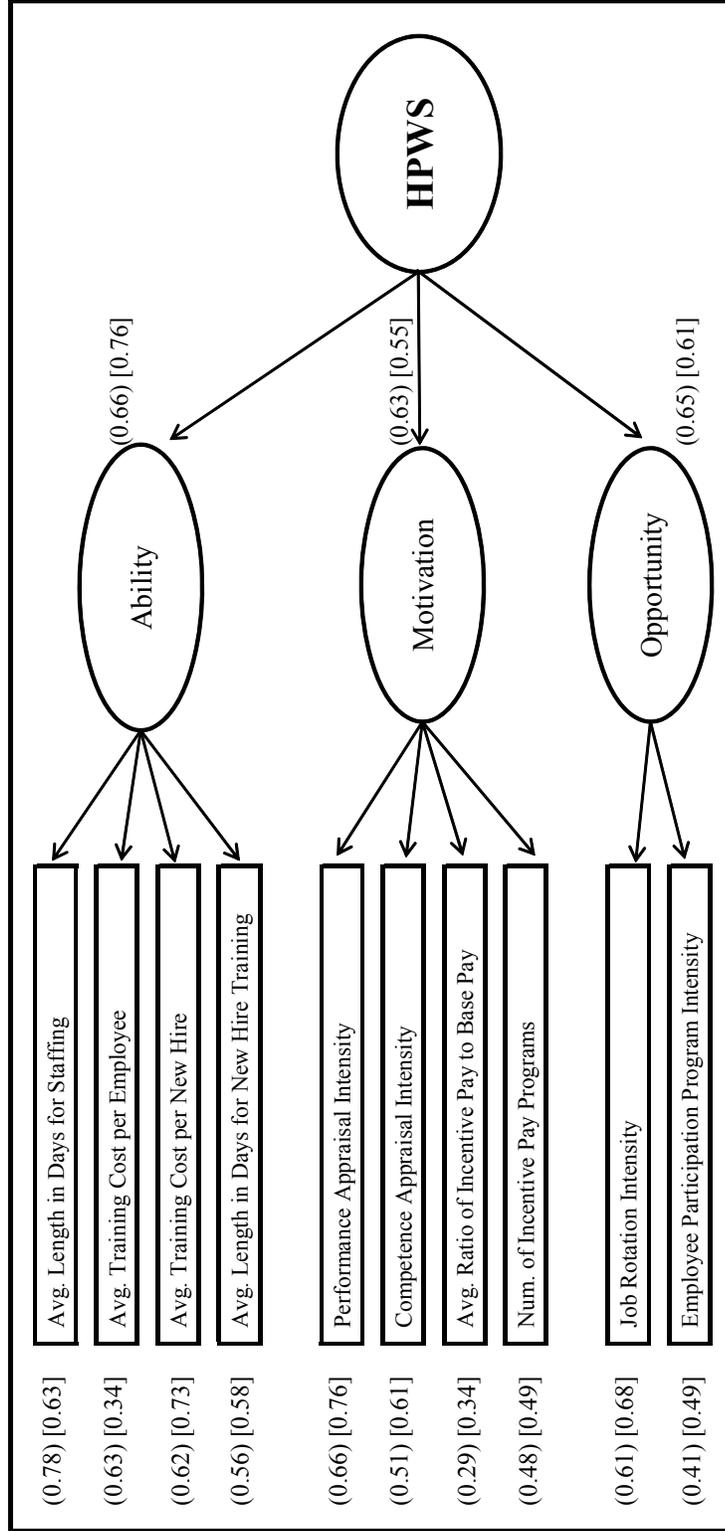
Note: Standard errors in parentheses. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

a. One tail test only for HPWS, and two tail test for the others. b. HPWS and firm performance were standardized. c. For Models 5, 6, 7, and 8 which control firm fixed effect, t=2006 and 2008.

d. Firm size were measured by total asset for Models 1, 2, 5, and 6. For the others, firm size were measured by total number of employees. e. 225 firms were included in the analysis twice.

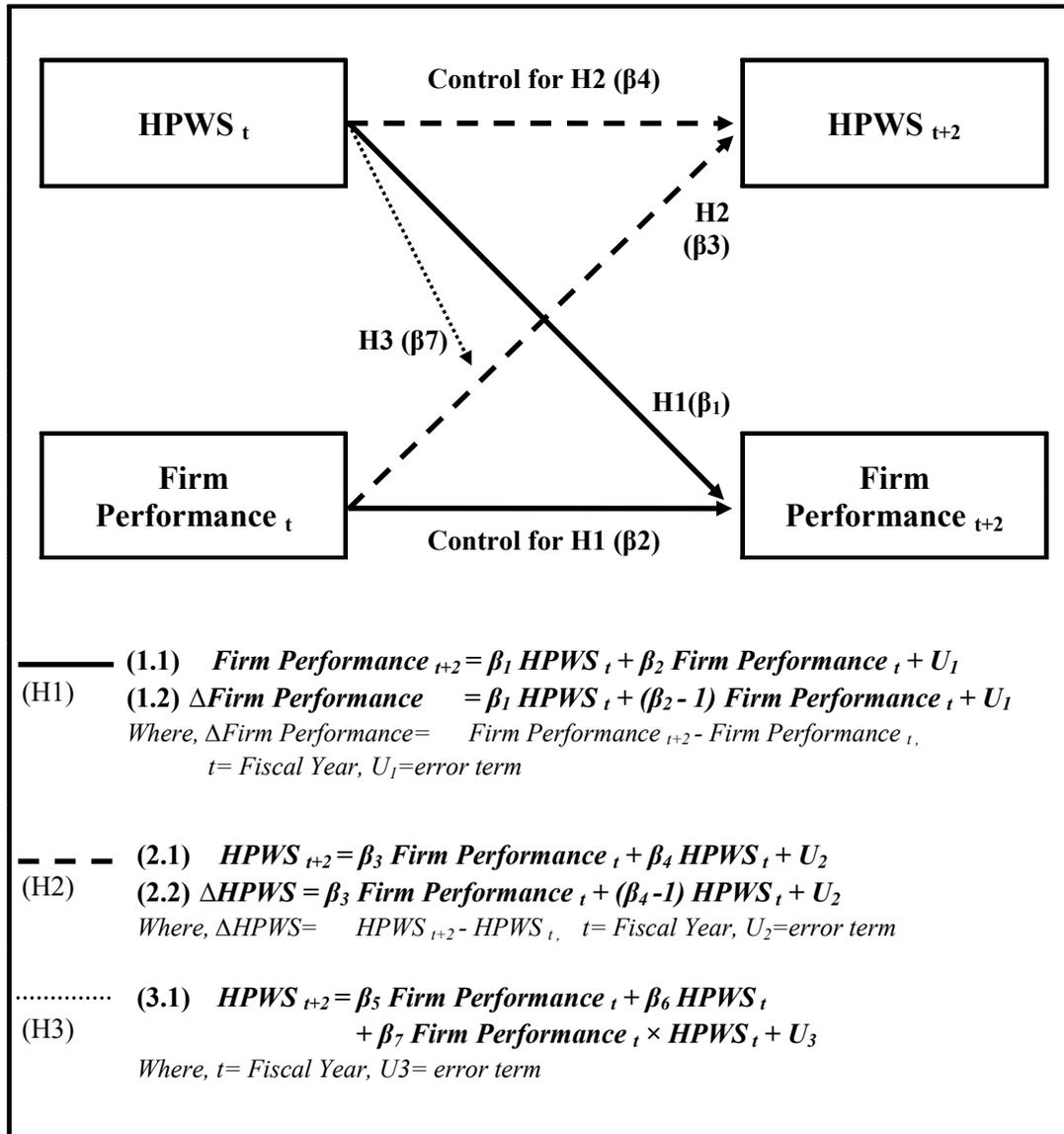
FIGURES

Figure 2.1: Conformatory Factor Analyses for High Performance Work System Scale 2006 and 2008



Note : The parentheses have the standardized regression weights of HPWS 2006, estimated under the constraint of equal measurement weights and structural weights in two fiscal years.
 The square brackets have the standardized regression weights of HPWS 2008, estimated under the constraint of equal measurement weights and structural weights in two fiscal years.
 All the estimated weights are significant ($p \leq 0.001$).

Figure 2.2: Cross Lagged Effect Model for Reciprocal Causality



CHAPTER 3

ROLES OF HR STAFF-EMPLOYEE INTERACTIONS IN HR STRATEGY

IMPLEMENTATION

INTRODUCTION

Scholars in the field of strategic human resource management (SHRM) have exerted significant efforts in examining the direct link between High Performance Work Systems (HPWSs) and firm performance, especially during the last two decades, and have reported generally positive associations between HPWSs and various dimensions of firm performance (Combs et al., 2006; Wright et al., 2005). Based on a resource-based view of a firm (Allen & Wright, 2007; Barney, 1991; Penrose, 1959; Wernerfelt, 1984), which finds a source of sustainable competitive advantage from the idiosyncrasy of a firm, SHRM researchers have contended that HPWSs which may develop high quality employees, motivate them to contribute, and provide them with opportunities to contribute would provide firms with sustainable competitive advantage (Chadwick & Dabu, 2009; Lepak, Liao, Chung, & Harden, 2006; Wright & McMahan, 1992; Wright, Dunford, & Snell, 2001), across firms and industries (Combs et al., 2006; Huselid, 1995).

HPWSs may provide sustainable competitive advantage via deriving value-creating behaviors from employees in each of the work units of a firm; however, prior research focusing only on a direct link between HPWSs and firm performance largely omitted consideration on when and how the value-creating behaviors of employees are derived by HPWSs (Becker & Huselid, 2006; Combs et al., 2006; Huselid et al., 1997; Wright et al., 2005). Rather, it seems to be assumed that adoption of the best tool, HPWSs, would automatically develop high-quality

workforces and derive their value-creating behaviors, equally across firms. Assuming the automatic following of effective implementations of given HR systems across firms and the prompt spreading of HPWSs among firms, prior research implicitly or explicitly maintained that the competitive advantage may erode as HPWSs are adopted by more and more competing firms, and that only the early adopters of HPWSs may be able to appropriate competitive advantage (e.g. Becker & Huselid, 2006; Paauwe & Boselie, 2005). However, other research has pointed out that HPWSs have not been widely spread, a result different from the anticipations of many of SHRM researchers (e.g. Blasi & Kruse, 2006; Boxall & Macky, 2009; Freeman & Rogers, 1999; Ichniowski et al., 1996), and also reported that there were low-performing firms observed among the firms utilizing a high level of HPWSs (Wright et al., 2005).

Recent reviews (e.g. Becker & Huselid, 2006; Bondarouk et al., 2009; Boxall, 1996; Combs et al., 2006) pointed out that adoption of HPWSs may not necessarily mean effective implementation of HPWSs, successful inducement of employees' strategic value creations. However, there has only been a small amount of shared understanding about the conditions for effective implementation of HPWSs (Combs et al., 2006; Huselid et al., 1997). Therefore, the current study focuses on the conditions for effective implementation of HPWSs.

Based on the process perspective that differentiates content and the implementation process of an HR system and that focuses on the interactions between HR staff and other employees in the implementation process, (Bondarouk et al., 2009; Bowen & Ostroff, 2004; Sanders & Frenkel, 2011), the current study focuses on the roles of HR staff activities and other employees' perceptions of the intra-organizational status of HR staff, in HPWS implementation. In doing so, the current study adopts Ulrich's (1997) typology, which categorizes HR staff activities into four different role categories -- strategic partner, change agent, employee

champion, and administrative expert -- and then examines the moderating roles of HR-employee communication activity (as an employee champion) and employee perception of HR staff status (as strategic partners and change agents), in the linkage between HPWS utilization and firm performance.

Further, the current study also examines whether the adoption of HPWSs would positively affect employee perception of the HR staff status. HPWS adoption may be an expensive organizational innovation involving persistent investment of organizational resources (Cappelli & Neumark, 2001; Wright et al., 2005) and the assignment of larger organizational resources to HR functions for HR system improvement may induce other employees to perceive their HR staff as strategic partners and change agents in high authority status. When the relationship holds, in turn, the benefit of HPWS adoption may be enhanced by the influence of a co-evolving employee perception of HR staff status, and examining the possibility of co-evolutionary relationship (Lewin & Volberda, 1999) may provide a more in-depth understanding of the link between HPWSs and firm performance.

THEORETICAL BACKGROUND AND HYPOTHESES

HPWSs and Firm Performance

HR systems have been suggested as one of the critical factors contributing to a firm's sustainable competitive advantage (e.g. Pfeffer, 1994; Wright & McMahan, 1992) in the field of strategic human resource management (SHRM). High Performance Work Systems (HPWSs), a system of HR practices designed to promote employee ability development, employee motivation, and employee empowerment and opportunities, have been suggested as one of the components that could contribute to the sustainable competitive advantage of a firm (Lepak et al.,

2006); rather than an objective to control for cost minimization, people in their work places began to be seen as value creators for the success of firms, deserving long term investment and empowerment.

SHRM researchers have found the theoretical foundations for the strategic value of employees and HR systems largely from the resource-based view of a firm (Barney, 1991; Penrose, 1959; Wernerfelt, 1984), which focuses on the idiosyncratic resources of firms as a source of sustainable competitive advantage; Barney (1991) submitted that valuable, rare, inimitable and non-substitutable resources are the source of sustained competitive advantage, and HPWSs began to be suggested as a possible promoter of the source of the sustained competitive advantage of a firm (e.g. Chadwick & Dabu, 2009; Wright et al., 2001).

Wright, Dunford and Snell (2001) suggested three HR components that provide a source of sustained competitive advantage: a human capital pool, employee relationships and behaviors, and a people management system. It was contended that the combination of the three basic components, not any single component, provides core competence through a complex and dynamic process of developing, renewing, and sharing knowledge stock within a firm, and, in turn, the core competence provides competitive advantage which is sustained as long as the core competence keeps being renewed successfully (Chadwick & Dabu, 2009; Leonard-Barton, 1992; Prahalad & Hamel, 1990; Teece & Pisano, 1994; Wright et al., 2001).

In this regard, employees have been suggested as carriers of organizational core competence (Bamberger & Meshoulam, 2000; Prahalad & Hamel, 1990) and/or strategic value-creators (Becker & Huselid, 2006) providing values to their firms by fulfilling their operational tasks at each subunit of a firm, and, also, HPWSs have been suggested as the HRM architectures through which firms develop the value creators and motivate and empower them to create

strategic values at their work units (Lepak et al., 2006; Lepak & Snell, 1999; Wright et al., 2001). Regarding the process through which HPWSs elicit value-creating behaviors from employees, Bowen and Ostroff (2004) implied that HPWSs, which are composed of multiple HR practices internally consistent and connected to firm strategy, may generate strong organizational climates relevant to firm strategies, and send symbolic signals or messages to employees through the organizational climates, thus eliciting strategic value-creating behaviors from employees; an organizational climate was defined as "*a shared perception of what the organization is like in terms of practices, policies, procedures, routines and rewards -what is important and what behaviors are expected and rewarded... - and is based on shared perceptions among employees within formal organizational units.*" (Bowen & Ostroff, 2004: 205, emphases added). When employees have a shared understanding of organizational goals, values and intentions aligned with their firm strategies, employees may be able to provide behaviors contributing to firm strategy achievement in each of a firm's operational functions, and the contributions of HPWSs to the sustainable competitive advantage of a firm may hold.

Based on the theoretical foundations linking HPWSs and firm performance, more than 92 empirical studies have presented direct and positive associations between HPWSs and various dimensions of firm performance during last two decades (see: Combs et al., 2006) and some recent studies have delineated how HPWSs derive strategically valuable behaviors from employees and contribute to firm performance as a result. For example, in their study on the IT industry, Collins and Smith (2006) presented that HPWSs generated an organizational climate of trust, cooperation and shared codes and languages, which, in turn, promoted knowledge exchange and combination among employees for product innovation, resulting in firm sales growth. In addition, Sun, Aryee and Law (2007) reported that HPWSs promoted employees'

service-oriented organizational citizenship behaviors and, in turn, resulted in higher productivity and lower employee turnover in the Chinese hotel industry.

HPWS Implementation Process and Participants

In spite of consistently accumulated evidence of a positive association between HPWSs and firm performance and recent efforts to delineate the process through which HPWSs impact firm performance, it has been pointed out that adoption of HPWSs may not necessarily mean effective implementation of the HPWSs (Becker & Huselid, 2006; Bondarouk et al., 2009; Bowen & Ostroff, 2004; Boxall, 1996; Combs et al., 2006) but that there is only a small amount of shared understanding about conditions for effective implementation of HPWSs in the field of SHRM (Combs et al., 2006; Huselid et al., 1997).

Based on the previously reviewed perspectives suggesting that HPWSs may contribute to firm performance through the value-creating behaviors of employees (Becker & Huselid, 2006; Bowen & Ostroff, 2004; Wright et al., 2001), the current study defines HPWS implementation as the process of inducing value-creating behaviors in employees in each of a firm's work units, and HPWS adoption as the enactment of the HR systems to provide platforms for developing value creators and developing their value-creating behaviors (Bondarouk et al., 2009; Bowen & Ostroff, 2004; Sanders & Frenkel, 2011). The differential conceptualization of the enactment of HR architecture and the process of inducing desired behaviors in employees in the link between HPWSs and firm performance suggests that the impact of HPWS adoption on firm performance may vary depending on the degree of effectiveness in HPWS implementation.

In search for the conditions of effective HPWS implementation, one of the critical points to consider may be who is involved in the process of HPWS implementation. First, there would

be no doubt in an HR staff's intrinsic roles in HPWS implementation. The HR staff initiates the process of HPWS implementation by adopting and enforcing the HR systems for employees. In this regard, Huselid and his colleagues (1997) focused on an HR staff's built-in capabilities associated with effective implementation of strategy-relevant HRM practices; it was suggested that an HR staff's professional and business-related capabilities contribute to firm performance through achieving substantive strategic HRM effectiveness, such as teamwork, employee participation, work force flexibility and deployment (Huselid et al., 1997).

Second, other line-managers and their workers in each functional unit are also involved in HPWS implementation. Becker and Huselid (2006) suggested each functional unit in a firm's business process as the locus of strategic value creation. The employees, embedded in the structure of a given set of HR policies and business operations, may complete the process of HPWS implementation by fulfilling their intrinsic functional tasks of business operation to generate strategic values. Moreover, during the business operations, line-managers, rather than HR staff, are supposed to conduct managerial roles to induce their subordinates' behaviors aligned with firm strategy (Bondarouk et al., 2009).

Conditions for Effective Implementation of HPWSs

Effective HPWS implementation would result when strategic value creations of employees in each functional unit are induced successfully (Becker & Huselid, 2006), and the value creating behaviors may occur when the employees share common organizational goals, values, and understand what they are supposed to do for the goals and values, through strong organizational climates (Bowen & Ostroff, 2004). Drawing from an attribution theory (Kelley, 1967), Bowen and Ostroff (2004) suggested conditions under which HR systems would create the strong

organizational climate directing employees toward shared goals; first, HR practices should be highly visible, clearly understandable, and perceived as relevant to employees' interests, and, also, HR staff enacting the practices should be considered as legitimate authorities attracting employees' willingness to submit or cooperate, in order to make the situational contingencies, or messages signaled through HR systems more observable and distinctive (Distinctiveness of Situation). Second, HR practices should be designed such that employees could perceive the relationship between desired behavior and consequences are instrumental, the practices have valid effects as purported, and the messages delivered through HR practices are consistent, in order to promote uniform interpretation of messages among employees (Consistency of Situation). Third, employees should be able to perceive agreement on messages among decision makers such as top managers and HR executives, and fairness of the enacted HR systems, in terms of organizational justice (see: Colquitt, Conlon, Wesson, Porter, & Ng, 2001), in order to build consensus among employees (Consensus on Situation).

In order to induce value creating behaviors of employees, first, the contents of HR systems, or HR practices should be designed to satisfy the suggested conditions; for instance, a bundle of multiple HR practices (MacDuffie, 1995) which are internally consistent and connected to firm strategy, may be more likely to allow delivering distinctive and consistent messages to employees, resulting in consensus among employees on firm strategies and expected behaviors, than individual HR practices. In addition, bundles of multiple HR practices which extensively invest in selecting and developing high quality employees, attach rewards to employee performance, and empower lower level employees to provide opportunity to contribute, may be more likely to allow employees to perceive their HR systems as relevant to their own interests, and fair, than traditional HR practices designed for controlling and cost minimization.

In this regard, the enactment of HPWSs may be more likely to allow satisfying the conditions for employee value creation than individual HR practices or traditional HR practice sets.

However, adoption of HPWSs itself may not be sufficient enough to generate strong organizational climates, and, in turn, successfully result in employee value creations; in addition to the established HR practices, effective interactions between HR staff and other employees in which HR related issues are effectively communicated and HR staff are perceived as legitimate authorities, may also be required.

Communication on HR Issues

Communication on HR issues between HR staff and other employees may play critical roles in promoting employees' value creations. Without effective communication with HR staff, the soldiers in each battle field, i.e. the individual employees in each functional unit, may fail to clearly understand how individual HR practices work, or may interpret idiosyncratically the responses or behaviors expected by the specific HR practices (Guzzo & Noonan, 1994; Nishii, Lepak, & Schneider, 2008). Moreover, understanding how multiple HR practices in HR systems are connected and work as a whole may be a larger challenge to employees, than understanding the contents of specific individual practices (Pfeffer, 1998). While the contents of HR practices could be seen ambiguous by the employees lacking knowledge of human resource management, the employees in different functional units may attend to different aspects of the information on the HR practices, thus resulting in misunderstanding or idiosyncratic interpretations of the contents (Bondarouk et al., 2009; Bowen & Ostroff, 2004; Dearborn & Simon, 1958). Without clear and congruent understanding on the contents of HR practices, symbolic messages sent by decision makers would fail to be delivered to employees, even when the practices are observable

and consistently configured, and, ultimately, the HR systems may fail in generating consensus among all the employees in a firm.

More importantly, without effective communications between HR staff and other employees, individual employees, having free will, may not be committed to the enacted HR practices, and may respond only ceremonially to the HR practices (Kostova & Roth, 2002; Oliver, 1991). In addition to clear understanding on the contents of HR practices, i.e., how they works and what are the desired response, employees may also need to understand how the behaviors desired by the practices are associated with certain employee consequences, instrumentally, and whether the associations are valid, in order to be motivated to comply with the expectation of the practices (Vroom, 1964).

Creation of strong organizational climates that would result in employees' strategic value creating behaviors requires employees' clear and congruent understanding of enacted HR systems and commitment to the HR systems (Bowen & Ostroff, 2004), and effective communication on HR issues between HR staff and other employees may enhance the employees' understanding on HR systems and commitment to them. Thus, the current study proposes that HR staff-employee communication on HR issues plays a critical role in HPWS implementation, and posits:

Hypothesis 1: An HR staff's communications with other employees on HR issues will moderate the relationship between HPWSs and firm performance; such that HPWSs will increase firm performance more when HR staff engage in the communications on HR issues to a greater extent.

Employee Perception on An HR Staff's Status

In addition to effective communication between HR staff and other employees, employee perception on HR staff's authority status may also affect effectiveness of HPWS implementation, i.e., the degree of success in inducing strategic value creating behaviors. Even when HR systems composed of internally and externally consistent HR practices are enacted, and HR staff actively engage in communications with other employees, employees may not pay attention to the HR systems and the HR staff, if they do not feel necessity and/or legitimacy in doing so; when HR staff is not perceived as a legitimate authority to respect and submit to their expectations, employees may not feel necessities of attention and compliance, thus failing to return value creating behaviors (Bowen & Ostroff, 2004).

An HR staff may be perceived as a legitimate authority when employees see the HR staff as high status agents supported by the top management and/or when employees perceive that their HR staff is playing important roles contributing to the success of a firm, rather than only an administrative role (Barney & Wright, 1998; Bowen & Ostroff, 2004; Galang & Ferris, 1997). When HR staff explain how HR function contribute to the success of a firm, especially in economic terms, through active communications with other employees, the employees may perceive their HR staff as important constituents to respect; however, the lack of accountability may be the most critical reason why an HR staff fails in achieving organizational power and status (Barney & Wright, 1998). Rather, an HR staff may be perceived as a legitimate authority through the impressions that they have power influencing top decision makers and what they are doing is important, regardless of whether such impressions are based on facts or not (Galang & Ferris, 1997).

Ulrich (1997) proposed that HR staff may play a part of or all of four basic roles as strategic partners, change agents, employee champions, and administrative experts. The strategic partner role encompasses activities that connect HR strategy and business strategy; the change agent role involves activities for identifying and implementing a process of organizational change; the employee champion role encompasses an HR staff's involvement in the day-to-day problems and needs of employees; and the administrative expert role encompasses the fulfillment of traditional HR tasks such as staffing, training, appraisal and compensation. Among those activities, an HR staff's activities as strategic partners and change agents may enhance employee perception on the authority status of an HR staff, since the activities, which involve participations in decision making process of top management, may signal to employees that the HR staff has the power to influence the top management, and, also, that HR function is strategically important.

When other employees perceive HR staff as strategic partners involved in business strategy planning and the CEO decision-making process, other employees may perceive HR staff as legitimate authorities (Sanders, Dorenbosch, & De Reuver, 2008). The impression of HR staff as agents influencing CEO's decision making may be interpreted as agents having power, by other employees. In addition, participation in strategy planning may generate the image that HR function is strategically important; Wright, McMahan, McCormick and Sherman (1998) reported that when HR managers were perceived as involved in strategic planning processes more intensively by other line managers, the managers evaluated their HR departments as more valuable units contributing to the firms' success.

Likewise, when other employees perceive HR staff as change agents leading innovative changes of organization and HR strategy, they may consider HR staff as legitimate authorities

(Sanders et al., 2008). The impression of HR staff as agents leading organizational change may be interpreted as agents having power influencing top management, by other employees, and may generate the image that an HR staff is not just a bureaucratic force just issuing pay checks, but agents playing proactive roles for the success of their firm.

When HR staff are perceived as strategic partners or change agents, the status of the HR staff may contribute to attracting the attention of employees on HR issues, and promoting employees' compliance, and, therefore, strategic value creating behaviors of employees may be more likely to be induced, at the given level of HPWS utilization. Thus, the current study posits:

Hypothesis 2: An HR staff's perceived status as strategic partners will moderate the relationship between HPWSs and firm performance; such that HPWSs will increase firm performance more when HR staff are perceived as strategic partners by other employees to a greater extent.

Hypothesis 3: An HR staff's perceived status as change agents will moderate the relationship between HPWSs and firm performance; such that HPWSs will increase firm performance more when HR staff are perceived as change agents by other line managers and employees to a greater extent.

HPWS Adoption and Perceived Status of An HR Staff

While an HR staff's perceived authority statuses as strategic partners and change agents may have impact on the relationship between HPWSs and firm performance by promoting the effectiveness of the HPWS implementation process, the adoption of HPWSs itself may affect

other employees' perception of the HR staff as a legitimate authority. When HPWS adoption enhances an HR staff's status of legitimate authority, in turn, the benefit of HPWS adoption may also be enhanced by the influence of the co-evolving HR staff status.

The transition from traditional HR systems that see employees as objectives to control for labor cost minimization to HPWSs that see employees as core competency carriers and strategic value creators (Bamberger & Meshoulam, 2000; Becker & Huselid, 2006; Prahalad & Hamel, 1990), may be an expensive organizational innovation involving persistent investment of organizational resources (Cappelli & Neumark, 2001; Wright et al., 2005); adoption of HPWSs can be seen as investment in human capital development and further sharing of firm profits for employee motivation (Wright et al., 2005). In addition, HPWS adoption may involve persisting financial investment since the development of core competency carriers and deriving their value-creating behaviors may be time dependent and the value of core competence may erode as time goes on, demanding continuous innovations for sustaining values.

The allocation of a large amount of organizational resources to an organizational functional unit may be perceived as a demonstration of power and authority conferred to the subunit by other employees, or the ability of influencing decision makers by other organizational constituents (Provan, 1980). When a large amount of organizational resources are assigned to HR functions for expensive HR system innovation such as adoption of HPWSs, other employees may be more likely to perceive their HR staff as strategic partners who are able to influence top management's strategic decisions, as well as change agents who lead organizational change and innovation, and, ultimately, the HR staff's perceived status of legitimate authority may be enhanced. Thus, the current study proposes and examines:

Hypothesis 4: HPWS adoption will enhance employee perception of HR staff as strategic partners.

Hypothesis 5: HPWS adoption will enhance employee perception of HR staff as change agents.

METHODS

Data

Data for the empirical analysis of the current study were gathered from the Human Capital Corporate Panel (HCCP) of the Korea Research Institute for Vocational Education and Training (KRIVET) and from the Korea Investors Service (KIS). The HCCP database has corporation-level data from HR and business strategy managers (management survey) and individual-level data from employees (workforce survey), both of which were collected through biannual surveys that started in 2005. In addition, the KIS database provides financial accounting information on the firms contained in the HCCP database, from 1995 to 2009. Although the names of the companies included in both the HCCP database and KIS database were not disclosed, the national research institute, KRIVET, coded identification numbers for the firms in the two databases, allowing merging the databases and controlling firm level fixed effect in analyses.

The current study utilizes the management survey and the workforce survey of the HCCP database. The management survey of the HCCP database includes items on human resource management and human resource development practices, business strategy, and other management related information of corporations. The workforce survey of the HCCP database

includes items on individual attitudes, behaviors, and perceptions, such as job satisfaction, perception of workplace practices and HR staff activities. In addition, the current study uses only the second and the third waves of the HCCP database, collected in 2007 and 2009, respectively; although the biannual surveys for the HCCP database were started in 2005, there was a significant change in the survey items between the first wave and the second wave, and, therefore, the current study does not use the first wave of HCCP data.

By a structurally randomized sampling process, the HCCP database generated a nationwide representative sample of companies that had hired 100 or more employees by the end of fiscal year 2004, across various industries in Korea. In the second and the third wave surveys, 358 firms participated in both waves. Among the 353 firms, 176 firms were included in the final sample utilized for the current study, after excluding the firms having incomplete information in any of the two waves of the HCCP management survey data, the two waves of the HCCP workforce survey data and the KIS data. The final sample of 176 firms selected after the listwise deletion is a subset of the sample of 225 firms utilized for the study in Chapter 2. While the measures of organizational characteristics of the 176 firms were gathered from the management survey of the HCCP data, the measures of employee perceptions were collected from the workforce survey of the data; to generate organization level measures by aggregating individual level measures in the workforce survey, the current study selected and utilized the responses of 2,822 and 2,696 white collar fulltime workers of non- HR functions in the 176 firms, taken from among the responses of 5,050 and 4,866 employees of the firms in the second and third waves of the workforce survey, respectively.

To check against the possibility of sampling bias, a probit regression was conducted with the 358 firms in the original panel data, and found no statistically significant impact from firm

size, firm age, industry, whether a firm is a sub-contractor or not, and whether there is any foreign ownership or not, on the propensity to be included in the final sample of 176 firms. Although the indifferences of the limited list of firm characteristics does not rule out the possibility of sampling bias, they increase the confidence that sampling bias does not threaten the validities of the results in the current study.

Measures

Principal variables

Firm performance. Firm performance was utilized as a dependent variable and a control variable in the examinations of hypotheses 1, 2, and 3. For the firm performance variable, one operational firm performance measure and three financial firm performance measures were utilized, separately, in the current study. The operational firm performance was measured by *labor productivity*, which was calculated by the logarithm of the ratio of total sales to total number of employees (Datta et al., 2005; Guthrie, 2001). The three financial firm performance measures used are *return on asset* (ROA) (e.g. Berman et al., 1999; Delery & Doty, 1996; Guthrie & Datta, 2010), *return on equity* (ROE) (e.g. Delery & Doty, 1996; Lepak et al., 2003) and *return on sales* (ROS) (e.g. Endo & Ozaki, 2010; Qian et al., 2008; Tallman & Li, 1996). The financial measures were directly obtained from the KIS data.

High Performance Work System (HPWS). High performance work system scales were generated and utilized as an independent variable. HPWS scales were generated by utilizing survey items on company records reflecting HR policies (Arthur & Boyles, 2007; Lepak et al., 2006) from the management survey of the HCCP data. Based on prior literature (Guthrie, 2001; Lawler et al., 2010; Lepak et al., 2006; Pfeffer, 1998; Wu et al., 2011), ten items related to

extensive selection and training, intensive appraisal and pay-for-performance, and employee participation and opportunity were directly selected or generated by calculations from the survey items. First, the following items relating to selection and training were utilized: average length in days for staffing, average training cost per employee, average training cost per new hire, and average length in days for new hire training. Second, the following items relating to compensation and appraisal were utilized: performance appraisal intensity, competence appraisal intensity, average ratio of incentive pay to base pay, and number of incentive pay programs. Third, the following items relating to employee participation were utilized: job rotation intensity and employee participation program intensity. Since different HR systems could be applied to different groups of workforces within a firm (Lepak & Snell, 1999), the current study primarily utilized items exclusively relevant to fulltime white collar workers; however, the study also included three items that may be applicable to all the fulltime workers, and therefore, were used as proxy measures. This was done due to the fact that the nature of the data set did not allow for differentiation between blue and white collar workers. The three items are average training cost per employee, job rotation intensity and employee participation program intensity. For further clarification of items for HPWS scales, please refer to Appendix A.

The results of exploratory factor analyses (EFAs) of HPWS scales for fiscal year 2006 (HPWS 2006) and fiscal year 2008 (HPWS 2008) are presented in Tables 3.1 and 3.2, and the results of confirmatory factor analyses (CFAs) of HPWS scales for the two fiscal years are provided in Figure 3.1. First, EFA of the HPWS 2006 scale and EFA of the HPWS 2008 scale were conducted separately to uncover the underlying factor structures of each HPWS scale. As seen in Tables 3.1 and 3.2, the measured variables selected for HPWS 2006 and HPWS 2008 loaded into three factors in each analysis, with factor loadings larger than 0.30 (Sun et al., 2007).

One finding worth note is that the measure of average length in days for new hire training loaded on both factor 1 and factor 2 with factor loadings larger than 0.30 in EFA of the HPWS 2006, as shown in Table 3.1; however, the current study used the measure for factor 1 in the following analyses, since the measure loaded only on factor 1 in EFA of the HPWS 2008 of the current study, and EFAs of the HPWS 2006 and the HPWS 2008 in Chapter 2. The current study named each of the three factors as "Ability," "Motivation," and "Opportunity," respectively, considering that the HR policies loading on the factors were related to employee ability attainment and development, employee motivation enhancement, and opportunities for employee involvement (Lepak et al., 2006). The extraction method was principal axis factoring and the rotation method was oblimin rotation with Kaiser normalization, considering the possibility that those three extracted factors would load again into another higher order latent construct, named as "High Performance Work System" (Beltrán-Martín et al., 2008; Camps & Luna-Arocas, 2012; Gong et al., 2010); EFAs were conducted, again, with the three factors, Ability, Motivation, and Opportunity, which were generated by aggregating the measured HR policy variables loading into the factors, respectively, and the three factors loaded into one factor, as shown in Tables 3.1 and 3.2.

Second, CFAs for HPWS 2006 and HPWS 2008 were conducted through the multiple group analysis method of AMOS 20.0, which fits multiple models with various assumptions on factor structures into multiple groups of data, simultaneously, and allows examining invariability of factor structures among the multiple groups of data. As shown in Figure 3.1, second-order CFA models were fitted into the variables for HPWS 2006 and HPWS 2008, simultaneously, with variant constraints on the regression weights in the factor structure. In the model with no constraints on the regression weights of HPWS 2006 and HPWS 2008, various CFA goodness-

of-fit criteria supported the second-order one factor model ($\chi^2 = 95.122$, d.f. = 64, $\chi^2 / \text{d.f.} = 1.486$, GFI=0.950, AGFI=0.914, CFI=0.942, RMSEA=0.037), and all the regression weights were significant ($P < 0.05$) in the factor structures of HPWS 2006 and HPWS 2008. In addition, in the model with the constraint that the measurement regression weights and the structural regression weights of HPWS 2006 and HPWS 2008 are equal, various CFA goodness-of-fit criteria also supported the second-order one factor model ($\chi^2 = 104.235$, d.f. = 73, $\chi^2 / \text{d.f.} = 1.428$, GFI=0.945, AGFI=0.917, CFI=0.942, RMSEA=0.035), and all the regression weights were significant ($P \leq 0.002$) in the factor structures of the HPWS 2006 and HPWS 2008 models. To test factor structure noninvariance between HPWS 2006 and HPWS 2008, χ^2 and CFI between the unconstrained and constrained models were compared; $\Delta\chi^2$ was 9.113 with degree of freedom 9 and, thus, the difference was not significant ($p = 0.427$), meaning that the factor structures of HPWS 2006 and HPWS 2008 are invariant. In addition, ΔCFI was 0.000 and met the invariance criteria requiring ΔCFI smaller than 0.01. Thus, the CFA results supported invariance of factor structures between HPWS 2006 and HPWS 2008.

Based on the results of EFAs and CFAs, the current study constructed HPWS scales by aggregating the selected ten HR policy measures. Since the items on company records are measured in various units and scales, all the measures were standardized before being aggregated to generate HPWS scales. The alpha reliability of HPWS 2006 was 0.71 and the alpha of HPWS 2008 was 0.72, satisfying the generally accepted criterion of 0.7.

Perceived Legitimate Authority Status of HR Staff (PLASH). Perceived legitimate authority status of HR Staff scales were generated and utilized as a moderating variable in the examinations of Hypotheses 1, 2, and 3, and as a dependent and a control variable in the examinations of Hypotheses 4, and 5. PLASH scales were generated from the items for

measuring HR-employee communication, employee perception of HR staff as strategic partners, and employee perception of HR staff as change agents in the workforce survey of the HCCP data; this was done due to the finding that all the survey items for these three measures were highly inter-correlated and loaded on one latent factor, during factor analyses, as shown in Table 3.3. Although the current study proposed multiple hypotheses corresponding to each of the three presumably different constructs, ex-ante, separate analyses with each of the three measures will not provide any additional gain, given the empirical finding from the factor analyses, ex-post. Thus, the current study generated PLASH scales and utilized the scales in examinations of the proposed hypotheses, treating Hypotheses 1, 2, and 3 as one hypothesis, and Hypotheses 4 and 5 as another hypothesis. For each measurement of HR-employee communication, employee perception of HR staff as strategic partners, and employee perception of HR staff as change agents, two five- point Likert scale items were asked to employees, and all the six items are presented in Appendix B.

PLASH scales, which were utilized as organization level variables in the current study, were generated through two steps; the six survey items for HR-employee communication, employee perception of HR staff as strategic partners, and employee perception of HR staff as change agents were aggregated at the individual level, and, then, the aggregates at the individual level were aggregated to the organizational level.

EFAs and CFAs were conducted before the first aggregation at the individual level. The results of EFAs for the PLASH scale of fiscal year 2006 (PLASH 2006) and fiscal year 2008 (PLASH 2008) are presented in Table 3.3. As aforementioned, all the measured variables loaded into one factor in each analysis. After conducting the EFAs, CFAs for PLASH 2006 and PLASH 2008 were conducted through the multiple group analysis method of AMOS 20.0. In the one

factor model with no constraints on the regression weights of PLASH 2006 and PLASH 2008, various CFA goodness-of-fit criteria supported the model ($\chi^2 = 23.788$, d.f. =10, $\chi^2 / \text{d.f.} = 2.379$, GFI=0.999, AGFI=0.994, CFI=0.999, RMSEA=0.016), and all the regression weights were significant ($p < 0.001$) in the factor structures of PLASH 2006 and PLASH 2008. In addition, in the model with the constraint that the measurement regression weights of PLASH 2006 and PLASH 2008 are equal, various CFA goodness-of-fit criteria also supported the one factor model ($\chi^2 = 30.162$, d.f. = 15, $\chi^2 / \text{d.f.} = 2.011$, GFI=0.998, AGFI=0.995, CFI=0.999, RMSEA=0.014), and all the regression weights were significant ($p < 0.001$) in the factor structures of PLASH 2006 and PLASH 2008. To test factor structure noninvariance between PLASH 2006 and PLASH 2008, χ^2 and CFI between the unconstrained and constrained models were compared; $\Delta\chi^2$ was 6.374 with degree of freedom 5, and, thus, the difference was not significant ($p = 0.272$), meaning that the factor structures of PLASH 2006 and PLASH 2006 are invariant. In addition, ΔCFI was 0.000 and met the invariance criteria requiring ΔCFI smaller than 0.01. Thus, the CFA results supported invariance of factor structures between PLASH 2006 and PLASH 2008. In addition, the alpha reliabilities of PLASH 2006 and PLASH 2008 were 0.89, satisfying the generally accepted criterion of 0.7.

To justify the aggregation to the organizational level, intraclass correlation coefficients, ICC(1) and ICC(2) were calculated; for PLASH 2006, ICC(1) was 0.16, and ICC(2) was 0.75. For PLASH 2008, ICC(1) was 0.11 and ICC(2) was 0.67, not deviating much from the generally accepted criterion of 0.7 (Klein & Kozlowski, 2000).

Based on the results of the factor analyses and the within-group agreement tests, the current study constructed PLASH scales, utilizing the survey responses of only the white collar fulltime workers of non- HR functions. This was done since the current study focuses on the

relationship between HR systems for the white collar fulltime workers and firm performance. The target number of respondents per firm for the workforce survey of the HCCP data was determined by the firm size; for instance, 27 employees was the target number of respondents for the firms of 300 or fewer employees and 56 employees was the target for the firms of 2,000 or more employees. In the current study, the number of usable responses from the non- HR white collar fulltime workers per firm ranged from 5 to 60 for PLASH 2006, and from 5 to 50 for PLASH 2008.

Control variables

Firm size, firm age, and union density were controlled in the analyses since these have been suggested as variables associated with firm performance (Guthrie, 2001). Two firm size variables were measured by *total number of employees* and *total asset*. However, the two firm size measures were highly inter-correlated ($\rho = 0.84$ in 2006 and $\rho = 0.87$ in 2008) and either one of the measures was utilized as control variable in each analysis. When firm performance was measured by ROE or ROA, and they were used as dependent variables in analyses, total number of employees was used as a measure of firm size, since ROA is a function of net income and total asset, and ROE is a function of net income and shareholder's equity, which is a part of total asset (ρ of total asset and shareholder's equity = 0.95 in 2006 and 0.96 in 2008). Likewise, when firm performance was measured by labor productivity, total asset was used as a measure of firm size, since labor productivity is a function of total sales and total number of employees. For all other analyses models, total asset was used as a measure of firm size. In addition, firm age was measured by the number of years of a firm's operation, and union density was calculated by the ratio of the number of union members to the total number of employees.

Second, *differentiation strategy and the differentiation strategy × HPWS interaction* were included as control variables. Differentiation strategy is a dummy variable indicating whether a firm primarily pursues a differentiation strategy (new product development or product quality improvement) or an overall cost leadership strategy (Porter, 1980). In addition, the interaction term was included as a control variable since HPWSs may work differently depending on the firm strategy (Wu et al., 2011; Yalabik et al., 2008).

Third, *ratio of export to total sales and product demand change from 2007 to 2008* were used to control impacts of domestic and foreign market environments on firm performance. Ratio of export to total sales was measured by directly asking with a six point scale item ranged "0%," "<10%," "<30%," "<50%," "<70%," and "<100%." Product demand change from 2007 to 2008 was also measured by asking strategy managers with a five-point scale item ranging from "Decreased very much" to "Increased very much."

Fourth, *change in organizational structure from 2007 to 2008* was added as a control to rule out the possible influence of organizational structural change on firm performance and PLASH. The variable was measured by a four-point scale item ranging from "Almost no change" to "Extensive change."

Fifth, *number of HR staffs per employee and labor relations* were included as controls in the analysis of the causal relationship between HPWSs and PLASH. Number of HR staff per employees was calculated by the ratio of total number of HR staffs to total number of employees. Labor relations was measured by directly asking to an HR manager with a five- point Likert scale item ranging from "very conflictual" to "very co-operative".

Sixth, as proxy measures of HR staff competence, *average HR experience of HR staffs* and *degree of HR specialization* were added as control variables, in the analyses on the causal

relationship between HPWSs and PLASH, since the level of HR staff competence may have an impact on employee perception on an HR staff's status and activities. In addition, the interaction terms between HPWSs and each of the two variables were added in the examination of the moderating role of PLASH in the HPWSs-firm performance relationship, in order to differentiate moderating impact of employee perception on an HR staff, and that of HR staff competence on the HPWSs-firm performance relationship. Average HR experience of HR staffs was measured by the mean of the HR work experience length in years of HR staffs. Degree of HR specialization was measured by a five-point scale rating system ranging from one to five, to measure how much HR staffs' tasks are specialized and/or concentrated. Point one means that there is no HR department and staffs take charge of HR tasks, together with various tasks distal to HR tasks. Point two means that there is no HR department and staffs take charge of HR tasks, together with administrative tasks related to HR. Point three means that there is an HR department and HR staffs take charge of HR tasks as generalists. Point four means that there is an HR department and two subunits of HR department take charge of one or two functional areas among human resource management (HRM), human resource development (HRD) and industrial relations (IR). Point five means that there is an HR department and three subunits specialize in one of HRM, HRD, and IR.

Finally, *industries* were controlled by dummy variables for the industrial categories; the industrial categories are manufacturing, media and IT service, financial service, and other service industries. For several models, *indicators for each firm* were included to control firm level fixed effect, instead of the industry variables. In addition, an *indicator of fiscal year* was also included in the models controlling firm fixed effect.

Analysis

The current study examines the hypotheses by two separate groups of regression models. First, to examine the moderation of PLASH in the causal relationship between HPWSs and firm performance, each of the operational and financial firm performance variables was regressed on the lagged value of HPWSs, the lagged value of PLASH, the interaction of the former and the latter, and the lagged value of the dependent variable. As presented in Chapter 2, the lagged values of the dependent variables were included as control variables in each model, in order to differentiate the partial and causal impact of HPWS utilization and moderating impact of PLASH on firm performance from the stability impact of the past value of the dependent variable on the dependent variable (Finkel, 1995; Rogosa, 1980). The results of analyses with the lagged value of dependent variable means that the model estimated the independent impact of the predictor variables on the difference between the level of the dependent variable and the lagged level of the dependent variable, in other words, the change in the dependent variable caused by the predictor variable; if we subtract the value of the lagged dependent variable from the left and right side of the regression equation, the dependent variable becomes the measure of change in the dependent variable between the time lag, and the regression coefficients of the predictor variable implies the impact of the predictor variable on the change in the value of the dependent variable (see: Finkel, 1995).

Second, to examine the causal relationship between HPWSs and PLASH, PLASH was regressed on the lagged value of HPWSs and the lagged value of PLASH, in the same vein; however, for a comparison between models, another regression model did not include the lagged value of the dependent variable as a control.

RESULTS

Table 3.4 provides the summary statistics and the correlation matrix of the variables utilized in the current study. While the sample includes 176 firms, 78 % of the firms were drawn from the manufacturing industry; however, no significant difference in industry composition between the original HCCP data and the sample of the current study was found. Interestingly, among the four industrial category indicators (manufacturing, media & IT service, financial service, and other service), the positive correlations between the indicator of financial service industry and HPWS scales were observed, meaning that financial firms utilized HPWSs more extensively than the firms in the other industries.

Regarding the principal variables of the current study, two notable points were observed. First, deep and sudden drops in mean values of all the financial performance measures were observed in 2008, while the mean values of productivity were very stable across fiscal years; ROE dived from 6.90 to -0.35, ROA dropped from 3.27 to 1.19, and ROS fell from 3.31 to 1.94, in 2008. In addition, while productivity measures were substantially and consistently correlated with each other across fiscal years, the correlations between each year's financial performance measures were relatively low, and they fall quickly as the time lag between the measures increases, except in the case of ROE; for example, ROE 2006 was negatively correlated with ROE 2007, positively associated with ROE2008, and, again, negatively correlated with ROE 2009. These observations may imply that financial performance is more vulnerable to the influences of the economic environment such as the U.S. subprime mortgage crisis of late 2007 to 2008, and the influences of prior financial performances disappear relatively quickly, thus allowing larger variability.

Second, the correlations between productivity measures and financial performance measures ranged from -0.02 to 0.30, mostly closer to the lower bound, and the correlations between HPWS scales and productivity variables were at least twice as large as the correlations between HPWS scales and financial performance measures in each fiscal year, thus implying that the financial performance may be a more distal organizational outcome of human resource management, compared with productivity (Huselid, 1995).

The OLS regression results are reported in the tables from Table 3.5 to Table 3.10. First, the tables from Table 3.5 to Table 3.8 show the test results on the moderating effects of PLASH on the causal relationship between the one-year-lagged HPWSs and four different measures of firm performance. Each of the tables presents five different models. In the first models of the tables, firm performance was regressed only on the control variables, including the one-year-lagged value of the dependent variable, and the indicators of firms and fiscal year. In the second models of the tables, HPWSs, the primary predictor, was added to the previous models, together with another control variable, the interaction term of HPWSs and differentiation strategy. In the third models, PLASH was added to the previous model. In the fourth models, the interaction term of HPWSs and PLASH was added to the previous model, to examine the hypothesized moderation effect. Finally, in the fifth models, average HR experience of HR staffs, degree of HR specialization, and the interaction terms of HPWSs and each of the two aforementioned variables were included as additional control variables, to assess whether the moderating effect of PLASH estimated in the previous model reflects the impact of employee perception on HR staffs or the impact of HR staff's actual competence that employees perceive.

Second, Table 3.9 presents the test results for the moderating effects of PLASH on the causal relationship between the two-year-lagged HPWSs and four different measures of firm

performance; in this table, only the full models including all the control variables and principal variables are presented. Although the nature of the data set did not allow examination of the two-year-lagged models with the control of firm fixed effect, the two-year-lagged models were tested and presented for the comparisons with the one-year-lagged models in the previous tables.

Third, Table 3.10 presents the test results on the causal relationship between HPWSs and PLASH; to demonstrate the role of the lagged dependent variable, PLASH was regressed on the two-year lagged HPWSs without and with controlling the two-year-lagged PLASH, in the two models presented in Table 3.10.

Moderating Role of PLASH in HPWSs-Performance Relationship

Hypotheses 1,2, and 3 proposed that HPWSs will increase firm performance more, when HR staff and other employees communicate on HR issues more extensively, when HR staff are perceived as strategic partners to a greater extent, and when HR staff are perceived as change agents to a greater extent. As previously mentioned, the current study examined Hypotheses 1, 2, and 3, by utilizing PLASH instead of each measure of the HR-employee communication, the strategic partner perception, and the change agent perception, due to the high correlations among the three variables. The test results for the moderating effect of PLASH in the causal relationship between HPWSs and firm performance are presented from Table 3.5 to 3.9. Tables 3.5,3.6, 3.7, and 3.8 present the results of the one-year-lag models where the one-year-lagged independent variables predict the dependent variables in the following year, and Table 3.9 provides results from the two-year-lagged models where the two-year-lagged independent variables predict the dependent variables in the following second year.

First, Table 3.5 provides the analysis results for the moderation effect of PLASH in the causal relationship between the one-year-lagged HPWSs and productivity. The current study regressed productivity on the one-year-lagged control variables in Model 1, and, then, repeated adding the one-year-lagged principal variables in the following models until interaction between HPWSs and PLASH was included in Model 4. In Model 5, moderating effects of average HR experience of HR staffs and degree of HR specialization were also assessed, in order to differentiate the impact of employee perception and the impact of HR staff's competence perceived by employees. In addition, all the models included firm level fixed effect control and the one-year-lagged dependent variable. As shown in Models 4 and 5 of Table 3.5, the coefficients of the interaction term between HPWSs and PLASH were significant ($\beta=0.083$ and 0.075 , $p<0.01$), meaning that PLASH moderated the causal relationship between HPWSs and Productivity in a positive way, as delineated in Figure 3.2. Thus, the result of Models 4 and 5 supported Hypotheses 1, 2, and 3. In addition, the models in Table 3.5 present the fact that adjusted R^2 rose from Model 1 to Model 4 as such principal variables as HPWSs, PLASH, and the interaction between the former and the latter were added, thus meaning that the moderation of PLASH in the HPWSs-productivity relationship provides additional explanatory power ($p<0.01$); however, the magnitude of change in the adjusted R^2 was small. Relevantly, the significant and relatively large coefficients ($\beta \geq 0.329$, $p<0.001$) of the one-year-lagged values of the dependent variable across the models in Table 3.5 mean that past productivity is a dominant determinant of the productivity in the following year.

One finding worth mentioning is that a strong contingency (Kaufman, 2010a) of HPWSs' efficacy on firm strategy was found in the models without consideration of the moderating role of PLASH (Models 2 and 3), contradicting the claim of universal efficacy of HPWSs; however,

the contingency on firm strategy disappeared in the models that included the interaction between HPWSs and PLASH (Models 4 and 5). Although the interaction between HPWSs and differentiation strategy of a firm was not central to the models of the current study and it was added as a control variable, the implication of the empirical finding of the strong contingency of HPWSs-productivity relationship on firm strategy is not negligible, if the finding holds; the negative and significant coefficient of HPWSs-differentiation strategy interaction (beta= -0.141 and -0.135, $p < 0.05$, in Models 2 and 3, respectively) which is larger in magnitude than the coefficient of HPWSs (beta=0.110 and 0.107, $p < 0.05$, in Models 2 and 3, respectively) means that HPWSs will increase productivity only in the firms utilizing a cost leadership strategy while HPWSs will decrease productivity in the firms utilizing a differentiation strategy. The implication deviates from the anticipation of the prior studies that suggested a positive impact of HPWSs on performance across firms and additional performance gains under the differentiation strategy (Huselid, 1995). However, this discrepancy was, at least, partially resolved by adding more rigorous model specification by considering the moderating role of PLASH; the result of Models 4 and 5 show that HPWSs increase productivity across firms. In addition, the results of testing the effect of interaction between HPWSs and differentiation strategy have been inconclusive in prior empirical studies (Wu et al., 2011).

Second, Table 3.6 provides the analysis results for the moderation effect of PLASH in the causal relationship between the one-year lagged HPWSs and ROS. ROS was regressed on the one-year-lagged control variables including firm fixed effect control and the one-year-lagged dependent variable in Model 1, and then, additional predictors were included in each of the following models to delineate the change of adjusted R^2 . As shown in Models 4 and 5 of Table 3.6, the coefficients of the interaction term between HPWSs and PLASH were significant

(beta=0.061, $p < 0.05$ in Model 4, and beta=0.048, $p < 0.1$ in Model 5), meaning that PLASH moderated the causal relationship between HPWSs and ROS in a positive way, as delineated in Figure 3.3. Thus, the result of Models 4 and 5 supported Hypotheses 1, 2, and 3. Similar to the result of productivity models, the moderation of PLASH in the HPWSs-productivity relationship provided additional explanatory power ($p < 0.05$), but the magnitude of change in the adjusted R^2 was small; the one-year-lagged values of the dependent variable (beta ≥ 0.235 , $p < 0.001$) dominated the prediction of the dependent variable across models.

Third, Tables 3.7 and 3.8 present the test results for the moderation effect of PLASH in the causal relationship between the one-year lagged HPWSs and two other financial performance measures, ROE and ROA. Contrary to the previous models, however, the ROE and ROA models did not provide supports for the moderating role of PLASH in the causal relationship between HPWSs and financial firm performance; the ROE models did not satisfied even the overall goodness-of-fit criterion, and the ROA model only showed dominancy of the one-year-lagged dependent variable in the prediction of the dependent variable in the following year.

Finally, Table 3.9 presents the test results of the two-year-lagged models of various dependent variables; however, the results did not provide any support for the moderation effect of PLASH. The nature of the data did not allow controlling firm level fixed effect in the two-year-lagged models, and, thus, direct comparison of the results of the previously presented one-year-lagged models with the fixed effect controls and the two-year-lagged model in Table 3.9 may not be appropriate. However, the results of the productivity model (Model 1) and ROS (Model 2) in Table 3.9, the two-year-lagged models, presented supports for the universally positive causal relationship between HPWSs and firm performance, similar to the results of the

one-year-lagged models presented in Models 4 and 5 of Table 3.5 (the productivity models) and Models 4 and 5 of Table 3.6 (the ROS models).

In summary, Hypotheses 1, 2, and 3 proposing the moderating roles of HR-employee communication, employee perception of HR staff as strategic partners, and employee perception of HR staff as change agents, in the causal relationship between HPWSs and firm performance were partially supported. PLASH moderated the causal relationship between HPWSs and productivity in the following year, and, also, PLASH moderated the causal relationship between HPWSs and ROS in the following year. However, no supports for Hypotheses 1, 2, and 3 was found in the ROE and ROA models. In addition, although examining the moderating effect of PLASH in various models of different time lag between independent and dependent variables is not central to the current study, all the two-year-lagged models did not provide support for the moderation effect of PLASH.

Causal Relationship between HPWSs and PLASH

Hypotheses 4, and 5 proposed that HPWSs will enhance employee perception of HR staff as strategic partners and employee perception of HR staff as change agents. Again, the current study examined Hypotheses 4, and 5, by utilizing PLASH instead of each measure of the strategic partner perception, and the change agent perception, due to their high intercorrelation. The test result for the causal relationship between HPWSs and PLASH is presented in Model 2 of Table 3.10; in the model, PLASH was regressed on the two-year-lagged HPWSs and the two-year-lagged PLASH, as well as other control variables, in order to differentiate the independent causal impact of the lagged HPWSs on PLASH in the following second year, from the stability impact of the lagged value of PLASH on PLASH in the following second year. Model 1 in

Table 3.10 presents the result of the test conducted without controlling the lagged dependent variable, for comparison.

As shown in Model 2, the coefficient of HPWS 2006 was significant and positive ($\beta=0.098$, $p<0.1$) as well as the coefficient of PLASH2006 ($\beta=0.298$, $p<0.001$). The result of Model 2 implies that HPWS 2006 resulted in an increase of PLASH in the following two years (the difference between PLASH 2008 and PLASH 2006), since the lagged value of the dependent variable was controlled (Finkel, 1995). Compared with Model 2, Model 1 did not control the lagged dependent variable. Although the result of Model 1 presented a significant and larger coefficient of HPWS 2006 ($\beta=0.209$, $p<0.05$), the model could not differentiate the impact of HPWS2006 on PLASH 2008 from the impact of PLASH 2006 on PLASH 2008, and the significant and positive coefficient of HPWS 2006 does not necessarily mean that HPWS2006 had impact on the change of PLASH from 2006 to 2008. In sum, the result of Model 2 in Table 3.10 provided evidence for the causal relationship between HPWSs and PLASH and supported Hypotheses 4 and 5.

DISCUSSION AND CONCLUSION

Having a good tool is one thing, and effectively using it to achieve one's goal is another. In search of evidence of HR function's contribution to firm performance, however, the prior studies focused on the direct link between the adopted HR systems and firm performance, largely omitting consideration of the mechanism through which the given HR systems are implemented to achieve a firm's strategic goal (Combs et al., 2006; Huselid et al., 1997). HPWSs may contribute to firm performance by inducing strategic value creating behaviors of employees in each functional unit (Becker & Huselid, 2006); however, the successful inducement of the

desired employee behaviors may not be automatically achieved by simply enacting a certain level of HPWSs (Becker & Huselid, 2006; Bondarouk et al., 2009; Boxall, 1996; Combs et al., 2006). Thus, the current study focused on investigating the largely unknown conditions for the effective implementation of HPWSs.

After defining HPWS implementation as the process of inducing strategic value creating behaviors of employees, the current study argued that not only HR staff but also the other employees are involved in the implementation process of HPWSs. Then, the current study proposed that effective HR staff-employee communication on HR issues, and employee recognition of HR staff as strategic partners and change agents will facilitate the employees' value creating behaviors at the given level of HPWS utilization, in Hypotheses 1, 2, and 3. In addition, the current study also proposed that the adoption of HPWSs will enhance employee perception of HR staff as strategic partners, and employee perception of HR staff as change agents, in Hypotheses 4 and 5.

In data analyses, the current study found high inter-correlations among the survey item scores for measuring HR-employee communication, employee perception of HR staff as strategic partners, and employee perception of HR staff as change agents, and ,thus, generated a new scale, labeled as perceived legitimate authority status of HR staff (PLASH) by aggregating the individual level survey items, and then, again, aggregating to organization level measures. The results of the tests examining the moderating effect of PLASH in the relationship between HPWSs and firm performance were mixed; PLASH moderated the HPWSs-productivity relationship, and the HPWSs-ROS relationship, in the one-year-lagged models with the control of firm fixed effects, but no evidence supporting the moderating role of PLASH was found in the ROE and ROA models at various time lag settings, nor in the two-year-lagged models of

productivity and ROS. In addition, the test of the causal relationship between HPWSs and PLASH provided evidence supporting the causal relationship, in the two-year-lagged setting.

Theoretical and Empirical Implications

First, the current study unexpectedly found high inter-correlations among the survey item scores for HR-employee communication, and for employee perceptions of HR staff as strategic partners and change agents. One possible explanation is that the item scores could be highly inter-correlated, simply because competent HR staffs may well play all the roles of strategic partners and change agents, as well as the HR staff-employee communication as employee champions, while less competent HR staffs perform less effectively in all types of HR roles. In addition, it is also possible that the item scores could be highly correlated since employees may possess their impressions of HR staff through their communications with the HR staff. Galang and Ferris (1997) maintained that HR staffs are in the position of influencing other organizational constituents without authority, and may gain organizational powers through symbolic actions generating the impression that HR functions play critical roles in the organizational success. Thus, HR staff may deliver desired images of HR function through communications with the other employees to generate the structured reality favorable for HR staff, and, as a result, the extent of the HR staff-employee communication may co-vary with employee perceptions of HR staff as strategic partners and change agents. Thus, the finding suggests the need for future research providing a more comprehensive understanding of the mechanism underlying employee perception of HR staff's legitimate authority status and the role of HR staff-employee communication.

Second, the results of the tests conducted with the newly generated scale, PLASH, provided evidence supporting the moderating roles of PLASH in the causal relationship between HPWSs and productivity, and the causal relationship between HPWSs and ROS, in the one-year-lagged models. Although the positive results were not found in the ROE, and ROA models, it is not surprising as previously mentioned in Chapter 2. While extensive research has examined the direct relationship between HPWSs and firm performance and suggested positive associations between the former and the latter, there are, at most, only a few studies examining the causal relationships between them, and the results are inconclusive (e.g. Guest et al., 2003; Razouk, 2011). The negative results in the ROE and ROA models may imply that those accounting measures of firm performance may be too distal from HPWS utilization and vulnerable to other influential factors such as global economic environments, and thus, the causal relationship between HPWSs and the accounting measures, as well as the moderation effect of PLASH, could not hold. In addition, how long the moderation effect of PLASH in the causal relationship between HPWSs and firm performance will last was not a central question of the current study, and the negative results from the two-year-lagged models do not alleviate the contribution of the findings from the one-year-lagged models. Thus, the current study contributed to SHRM literature by suggesting and providing evidence supporting that HR-employee communication and HR staff's perceived status as strategic partners and change agents are facilitators for effective implementation of HPWSs.

Moreover, the findings also contribute to the field of human resources and organizational studies by suggesting that employee perception of the legitimate authority status of HR staff, rather than actual power status of the HR staff conferred by the higher authority, may induce attention and cooperation of the other employees; Sheehan, Cooper, Holland and De Cieri (2007)

examined the moderating effects of HRM representation on the board of directors, and HR manager's self perception of his/her involvement in the strategic decision making process, in the relationship between HRM policy connectedness and perceived organizational performance. However, the study did not find supporting evidence. Furthermore, the current study also found moderating impact of PLASH in the models that controlled proxy measures on HR staff competence to rule out the possibility that the moderation of PLASH reflects the role of HR staffs' actual competence rather than employee perception on HR staffs. As previously mentioned, the items for PLASH could be highly inter-correlated simply because an HR staff with high competence could carry out various HR activities well, and PLASH could simply reflect HR staff competence. Thus, the findings of the current study may imply that employee perception on an HR staff's status and activity is one of the facilitators for effective HR system implementation. Although the current study is one of the pioneering studies examining the moderating role of HR-employee communication and employee perception of HR staff status, more research are needed to generalize the findings of the current study. Future research examining the role of employee perception on HR staff status and activity, together with various measures on HR staff status and HR staff competence will provide a more comprehensive understanding and generalizable evidence for the roles of employee perception on HR staff authority status and activity, actual HR staff status, and HR staff competence.

Third, the current study found the causal relationship between HPWSs and PLASH; while the prior level of PLASH explained the increase in the level of PLASH in the following two years, HPWSs also independently explained the change, thus meaning that a causal relationship exists. Although there were a number of studies suggesting that HR staffs may elevate their perceived status in terms of strategic value by engaging in strategic activities (e.g.

Barney & Wright, 1998; Wright et al., 1998), and examining associations between the use of HPWSs and other managers' evaluations of their HR staffs' strategic value (e.g. Guthrie, Flood, Liu, MacCurtain, & Armstrong, 2011), the current study is one of the very few early attempts, if any, at examining the causal relationship between HPWSs and HR staff's legitimate authority status, especially, which are perceived by multiple employees at various ranks and functional tasks other than HR tasks in each firm. Thus, the current study contributes to HR literature by presenting the evidence of one mechanism for HR staffs' organizational status elevation.

In addition, the findings allowed a more comprehensive understanding of the mechanism through which HPWSs influence firm performance. Although the current study could not uncover the exact length of time for the realization of the HPWS adoption's impact on PLASH, the finding of the causal relationship between HPWSs and PLASH implies that the impact of HPWS adoption on firm performance could be enhanced by the HPWS adoption itself, via enhancement of the level of the implementation facilitator, PLASH, which is induced by the HPWS adoption; when HPWSs are utilized to a greater extent, HPWS utilization will elevate PLASH, and, in turn, the elevated PLASH moderates the relationship between HPWS utilization and firm performance in a positive way. Thus, from the empirical point of view, the finding implies that estimations of the moderating effect of PLASH could be overstated to the extent that HPWS utilization elevates the level of PLASH.

Thus, future research examining the time dependency in the HPWSs-PLASH relationship and/or testing the reciprocal influence between HPWSs and PLASH in the same time-lag setting and will provide a more in-depth understanding of the relationships among HPWSs, PLASH, and firm performance.

Implications for HR Managers and Top Management

The findings of the current study also provide practical insights for managerial decision makers as well as HR practitioners. First, the current study showed that HR staff should achieve the status of legitimate authority recognized by the other employees, and should actively engage in communications with the other employees on HR issues, in order to get the most out of the enacted HR systems. The effective implementation of the given HR systems is achieved by successfully inducing desired behaviors of the employees, and the achievement of goals requires the understanding and the cooperation of the other employees who have free wills and their own interests. Thus, HR staffs and the management should also consider the importance of attracting employees attention and compliance, and sharing a clear and congruent understanding of HR systems with employees, as well as enacting well developed HR systems.

In promoting employee's understanding on HR issues and being recognized as legitimate authorities, HR staff need to clearly understand and be able to explain the strategic implication of overall HR systems, and, in turn, proactively play the roles of strategic partners and change agents. In addition, top managements should support the development of HR staff's competency, as well as the investment of organizational resources in HR system innovation.

Moreover, the current study showed that utilizing HPWSs is an advantageous HR strategy aligned with the interests of the organizational shareholders, and also with the interests of HR staff. Greater use of HPWSs increases productivity and ROS, and, also, elevates the legitimate status of HR staff perceived by other employees in a firm, across firms and industries, meaning that staying in traditional control based HR systems or returning to them will remove the opportunities for gaining performance enhancement and elevating HR staffs' perceived legitimate authority status that would promote effective implementation of enacted HR systems,

all together. Thus, the findings of the current study strongly encourage HR practitioners to claim investment in HPWSs.

Limitations and Future Research

The current study has some limitations. First, the examination of the causality between HPWSs and PLASH is not free from the possibility of omitted variable bias, which would occur when an unobserved variable is associated with both the firm performance and HPWS utilization. While the test of the moderation of PLASH in the causal relationship between HPWSs and firm performance could be conducted with the control of firm level fixed effect, the two waves of panel data did not allow using the fixed effect model in the examination of the causal relationship between HPWSs and PLASH. If there are unobserved factors that positively affect both HPWS utilization and PLASH, the validity of the causal relationship between productivity and firm performance could be threatened. Thus, future research with more waves of panel data and more rigorous model specification would overcome the threat of omitted variable bias.

Second, while the current study is one of pioneering research providing evidences of moderating roles of HR staff-employee communication and employee perception of HR staff as strategic partners and change agents in the relationship between HPWSs and firm performance, the nature of the data did not allow examining the process through which the suggested moderators influences the effectiveness of HPWS implementation. Thus, future research developing and utilizing direct measures such as employee's understanding on HR systems and willingness to cooperate with HR staffs and examining the suggested process models would advance the SHRM literature.

In addition, the current study examined only the direct link between HPWSs and PLASH, rather than testing the process through which HPWSs influence PLASH; although the causal relationship was uncovered, the test results could not reveal whether HPWS utilization elevate HR staff's perceived status by signaling HR function's power of influencing key decision makers, or HPWS utilization influenced HR staff's perceived status by providing certain outcomes such as firm performance enhancement (Guthrie et al., 2011). Thus, again, future research examining the process models are need.

Finally, although a growing amount of research in the field of human resource studies has accumulated evidence supporting the invariance of study results between studies conducted in the U.S. and those in other countries (e.g. Bae et al., 2003; Bae & Lawler, 2000; Guthrie, 2001; Razouk, 2011; Sun et al., 2007; Takeuchi et al., 2007; Wu et al., 2011), the findings of the current study conducted in the context of the Korean economy may not be generalized to other national contexts. Future research examining the relationships among HR staff-employee communications, employee perceptions on HR staff's authority status, HPWSs, and firm performance in various national contexts, would enhance our understanding of the relationships as well as the generalizability of the relationship.

Conclusion

Notwithstanding these limitations, the current study provided evidence supporting that effectiveness of HPWS implementation varies depending on the extent of HR-employee communication, and the level of employee perception on HR staff's legitimate authority status, and that use of HPWSs results in elevation of HR staff's legitimate authority status, by the examination of a national representative sample of Korean firms of various sizes and industries.

The current study contribute to SHRM literature by uncovering organizational factors influencing effective HPWS implementation, and will advance the field of SHRM by facilitating insightful future research focusing on HR strategy implementation.

TABLES

Table 3.1: Exploratory Factor Analyses for High Performance Work System Scale 2006

Variables	First Order*			Second Order	
	Factor 1 (Ability)	Factor 2 (Motivation)	Factor 3 (Opportunity)	Latent Variables	Factor 1
Avg. Length in Days for Staffing	0.80	0.12	0.03	Ability	0.58
Avg. Training Cost per Employee	0.61	0.34	-0.21		
Avg. Training Cost per New Hire	0.67	-0.19	0.25		
Avg. Length in Days for New Hire Training	0.36	-0.02	0.41		
Performance Appraisal Intensity	0.09	0.56	-0.03	Motivation	0.47
Competence Appraisal Intensity	-0.01	0.38	0.07		
Avg. Ratio of Incentive Pay to Base Pay	0.04	0.40	-0.02		
Num. of Incentive Pay Programs	-0.07	0.59	0.10		
Job Rotation Intensity	0.12	0.04	0.40	Opportunity	0.50
Employee Participation Program Intensity	-0.07	0.17	0.40		
Eigenvalue	2.88	1.48	1.11		1.53
Percentage of variance	28.77	14.76	11.09		50.96

Bold indicates that the variable loads into the corresponding factor.

Extraction Method: Principal Axis Factoring.

* Rotation Method: Oblimin with Kaiser Normalization.

Table 3.2: Exploratory Factor Analyses for High Performance Work System Scale 2008

Variables	First Order*			Second Order	
	Factor 1 (Ability)	Factor 2 (Motivation)	Factor 3 (Opportunity)	Latent Variables	Factor 1
Avg. Length in Days for Staffing	0.50	0.10	-0.04	Ability	0.62
Avg. Training Cost per Employee	0.41	0.07	0.03		
Avg. Training Cost per New Hire	0.91	-0.09	-0.06		
Avg. Length in Days for New Hire Training	0.46	0.02	0.14		
Performance Appraisal Intensity	0.01	0.82	-0.11	Motivation	0.52
Competence Appraisal Intensity	0.04	0.58	0.16		
Avg. Ratio of Incentive Pay to Base Pay	0.03	0.33	-0.01		
Num. of Incentive Pay Programs	0.01	0.47	0.04		
Job Rotation Intensity	0.19	-0.10	0.57	Opportunity	0.50
Employee Participation Program Intensity	-0.08	0.13	0.57		
Eigenvalue	2.92	1.39	1.10		1.60
Percentage of variance	29.18	13.86	10.96		53.22

Bold indicates that the variable loads into the corresponding factor.

Extraction Method: Principal Axis Factoring.

* Rotation Method: Oblimin with Kaiser Normalization.

Table 3.3: Exploratory Factor Analyses for Percieved Legitimate Authority Status of HR Staff (PLASH) Scale 2006 and 2008

Variables	2006	2008
	Factor 1	Factor 1
HR-Employee Communication 1	0.77	0.78
HR-Employee Communication 2	0.74	0.72
Stratigic Partner Perception 1	0.79	0.81
Stratigic Partner Perception 2	0.80	0.82
Change Agent Perception 1	0.75	0.75
Change Agent Perception 2	0.68	0.70
Eigenvalue	3.86	3.90
Percentage of variance	64.40	64.98

Extraction Method: Principal Axis Factoring.

Table 3.4: Descriptive Statistics and Correlations

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1. Productivity 2009 ^a	13.04	0.89	1.00																				
2. Productivity 2008 ^a	13.02	0.90	0.95	1.00																			
3. Productivity 2007 ^a	12.87	0.90	0.90	0.94	1.00																		
4. Productivity 2006 ^a	12.77	0.84	0.84	0.89	0.89	1.00																	
5. ROS 2009	4.29	15.23	0.08	0.03	0.12	0.01	1.00																
6. ROS 2008	1.94	21.08	0.16	0.14	0.19	0.15	0.26	0.28	1.00														
7. ROS 2007	3.31	11.19	0.12	0.14	0.19	0.15	0.26	0.28	1.00														
8. ROS 2006	2.00	23.70	0.09	0.02	0.02	0.16	-0.03	0.13	0.30	1.00													
9. ROE 2009	7.16	23.10	0.16	0.09	0.09	0.08	0.52	0.13	0.12	0.00	1.00												
10. ROE 2008	-0.35	29.41	0.08	0.10	0.11	0.13	0.23	0.55	0.28	0.12	0.07	1.00											
11. ROE 2007	6.90	20.48	0.10	0.13	0.14	0.11	0.07	0.16	0.61	0.15	-0.09	0.35	1.00										
12. ROE 2006	1.49	55.02	0.04	0.02	0.04	0.10	-0.01	0.05	-0.06	0.32	-0.13	0.05	-0.40	1.00									
13. ROA 2009	3.95	8.39	0.10	0.04	0.05	0.03	0.69	0.30	0.27	0.06	0.80	0.23	0.11	-0.08	1.00								
14. ROA 2008	1.19	12.28	0.09	0.11	0.12	0.14	0.37	0.68	0.33	0.21	0.15	0.83	0.27	0.09	0.39	1.00							
15. ROA 2007	3.27	7.88	0.05	0.08	0.11	0.06	0.18	0.23	0.80	0.22	0.08	0.33	0.83	-0.34	0.31	0.38	1.00						
16. ROA 2006	3.15	12.46	0.07	0.00	-0.02	0.09	-0.01	0.10	0.28	0.94	-0.04	0.12	0.20	0.30	0.08	0.22	0.32	1.00					
17. HPWS 2008	0.97	5.08	0.40	0.42	0.40	0.42	0.02	0.10	0.20	0.15	0.14	0.14	0.21	-0.04	0.09	0.11	0.17	1.00					
18. HPWS 2006	1.51	4.92	0.50	0.49	0.50	0.48	0.10	0.23	0.25	0.21	0.12	0.14	0.16	0.13	0.06	0.12	0.12	0.12	1.00				
19. PLASH 2008	3.44	0.30	0.27	0.26	0.29	0.26	0.27	0.12	0.13	-0.01	0.22	0.04	0.04	0.03	0.22	0.08	0.06	-0.03	0.28	1.00			
20. PLASH 2006	3.41	0.34	0.41	0.38	0.36	0.36	0.22	0.18	0.18	0.16	0.09	0.08	0.10	0.01	0.09	0.12	0.10	0.13	0.41	0.47	0.46	1.00	
21. Avg. HR Experience of HR Staffs 2008	7.46	3.51	-0.02	0.03	0.04	0.04	-0.01	-0.01	-0.03	0.00	-0.13	0.04	-0.01	-0.08	-0.09	0.05	-0.03	-0.03	-0.12	-0.14	-0.11	-0.06	
22. Avg. HR Experience of HR Staffs 2006	6.74	3.17	-0.02	-0.01	-0.02	-0.02	-0.08	-0.10	-0.10	-0.04	0.02	-0.03	-0.09	-0.01	0.02	-0.07	-0.14	-0.20	-0.21	-0.12	-0.12	-0.19	
23. Degree of HR Specialization 2008	3.16	0.91	0.28	0.27	0.28	0.26	0.06	0.15	0.14	0.10	0.12	0.08	0.14	-0.07	0.08	0.07	0.09	0.05	0.48	0.48	0.28	0.25	
24. Degree of HR Specialization 2006	3.04	0.86	0.26	0.24	0.22	0.26	-0.04	0.05	0.07	0.22	0.10	0.10	0.07	0.02	0.05	0.12	0.04	0.16	0.38	0.43	0.17	0.26	
25. Differentiation Strategy 2008 ^b	0.69	0.46	-0.02	-0.03	-0.01	-0.01	-0.09	0.05	0.00	0.18	-0.02	0.05	0.06	0.09	-0.02	0.08	-0.01	0.18	0.03	0.09	0.05	0.16	
26. Differentiation Strategy 2006 ^b	0.70	0.46	-0.10	-0.07	-0.06	0.02	-0.08	-0.12	0.06	0.00	0.09	-0.07	0.10	-0.08	-0.01	-0.06	0.07	-0.03	0.05	0.08	-0.01	-0.06	
27. Firm Age 2006	30.36	17.34	0.12	0.12	0.16	0.12	0.06	0.15	0.11	0.05	-0.03	0.14	0.11	-0.03	0.00	0.14	0.10	-0.01	0.20	0.22	0.15	0.23	
28. Total Num. Employees 2008	989.11	2457.44	0.24	0.26	0.22	0.20	0.03	0.13	0.13	0.08	0.03	0.11	0.10	0.07	-0.04	0.04	0.01	0.01	0.40	0.45	0.22	0.23	
29. Total Num. Employees 2006	982.19	2436.03	0.24	0.25	0.22	0.19	0.03	0.13	0.14	0.09	0.03	0.12	0.12	0.07	-0.04	0.05	0.02	0.02	0.41	0.44	0.21	0.23	
30. Num. of HR Staffs per Employee 2006	0.01	0.01	0.07	0.13	0.09	0.07	-0.17	-0.22	-0.16	-0.30	-0.02	-0.15	0.03	-0.29	-0.06	-0.24	-0.02	-0.23	0.02	-0.12	-0.06	-0.08	
31. Total Asset 2008	4.00 Bn.	23.90 Bn.	0.22	0.27	0.19	0.20	-0.01	0.02	0.11	0.06	0.00	0.06	0.08	0.05	-0.06	0.00	-0.03	-0.02	0.31	0.34	0.21	0.19	
32. Total Asset 2006	2.90 Bn.	17.60 Bn.	0.22	0.26	0.19	0.20	0.00	0.02	0.11	0.06	0.00	0.06	0.08	0.05	-0.06	0.00	-0.03	-0.02	0.30	0.33	0.21	0.19	
33. Union Density 2008	0.27	0.29	0.23	0.26	0.24	0.26	0.01	0.03	0.15	0.07	-0.05	0.17	0.22	0.03	-0.05	0.12	0.12	0.03	0.15	0.17	0.19	0.15	
34. Union Density 2006	0.28	0.30	0.27	0.31	0.29	0.30	0.00	0.03	0.16	0.08	-0.07	0.20	0.24	0.02	-0.04	0.15	0.15	0.04	0.15	0.21	0.22	0.21	
35. Labor Relations 2006	3.95	1.00	-0.16	-0.13	-0.14	-0.10	0.03	0.01	-0.12	0.08	0.04	-0.12	-0.06	-0.02	-0.01	-0.07	-0.11	-0.08	-0.07	-0.08	-0.02	0.09	
36. Export in Total Sales 2008	3.15	1.62	0.01	0.02	-0.01	-0.03	0.05	-0.05	-0.18	-0.09	0.03	-0.11	-0.13	0.06	0.07	-0.03	-0.13	-0.07	-0.08	-0.15	-0.04	-0.01	
37. Export in Total Sales 2006	3.05	1.62	0.03	0.04	0.00	-0.05	0.01	-0.05	-0.21	-0.17	0.01	-0.12	-0.17	0.03	0.04	-0.04	-0.17	-0.15	-0.08	-0.15	-0.06	-0.01	
38. Product Demand Change 2007-2008	3.23	1.03	0.22	0.18	0.13	0.07	-0.04	0.04	-0.10	-0.01	0.10	-0.04	-0.09	0.01	0.05	0.00	-0.07	-0.01	0.02	0.03	0.10	0.07	
39. Org. Structure Change 2007-2008	2.66	0.79	0.19	0.11	0.13	0.10	-0.04	0.11	0.12	0.15	0.09	0.08	0.08	-0.05	0.04	0.05	0.09	0.17	0.20	0.25	0.20	0.25	
40. Manufacturing ^b	0.78	0.42	-0.06	-0.08	-0.11	-0.10	0.02	-0.12	-0.01	-0.07	0.09	-0.08	-0.06	-0.09	0.10	0.04	0.08	-0.01	-0.01	-0.13	-0.01	0.09	
41. Media & IT Service ^b	0.09	0.29	-0.05	-0.04	-0.02	0.00	-0.11	-0.10	-0.15	-0.03	-0.03	-0.09	-0.10	0.00	-0.06	-0.19	-0.14	-0.04	-0.07	-0.05	-0.01	-0.14	
42. Financial Service ^b	0.07	0.25	0.37	0.40	0.34	0.39	0.01	0.03	0.14	0.08	0.03	0.11	0.16	0.09	-0.10	0.00	-0.06	-0.04	-0.03	0.24	0.38	0.14	
43. Other Service ^b	0.06	0.24	-0.22	-0.22	-0.15	-0.22	0.08	0.28	0.05	0.07	-0.15	0.14	0.06	0.07	0.01	0.16	0.08	0.11	-0.15	-0.10	-0.10	-0.14	

Note: N=176. Bn. =Billion Korean Won. a. = Natural logarithm. b. = Dummy variable.

Table 3.4 (Cont.)

Variable	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	
1. Productivity 2009 ^a																								
2. Productivity 2008 ^a																								
3. Productivity 2007 ^a																								
4. Productivity 2006 ^a																								
5. ROS 2009																								
6. ROS 2008																								
7. ROS 2007																								
8. ROS 2006																								
9. ROE 2009																								
10. ROE 2008																								
11. ROE 2007																								
12. ROE 2006																								
13. ROA 2009																								
14. ROA 2008																								
15. ROA 2007																								
16. ROA 2006																								
17. HPWS 2008																								
18. HPWS 2006																								
19. PLASH 2008																								
20. PLASH 2006																								
21. Avg. HR Experience of HR Staffs 2008	1.00																							
22. Avg. HR Experience of HR Staffs 2006	0.52	1.00																						
23. Degree of HR Specialization 2008	-0.10	-0.06	1.00																					
24. Degree of HR Specialization 2006	0.00	0.01	0.61	1.00																				
25. Differentiation Strategy 2008 ^b	-0.13	-0.13	0.04	0.07	1.00																			
26. Differentiation Strategy 2006 ^b	-0.21	-0.15	0.01	0.06	0.33	1.00																		
27. Firm Age 2006	0.13	0.08	0.27	0.31	-0.03	0.04	1.00																	
28. Total Num. Employees 2008	-0.13	-0.08	0.45	0.46	0.02	-0.03	0.21	1.00																
29. Total Num. Employees 2006	-0.11	-0.09	0.46	0.46	0.01	-0.04	0.19	0.98	1.00															
30. Num. of HR Staffs per Employee 2006	0.00	-0.07	-0.11	-0.25	0.03	0.09	-0.23	-0.23	-0.24	1.00														
31. Total Asset 2008	-0.11	-0.10	0.30	0.33	0.08	0.01	0.11	0.87	0.85	-0.12	1.00													
32. Total Asset 2006	-0.11	-0.10	0.29	0.32	0.09	0.01	0.11	0.87	0.84	-0.12	1.00	1.00												
33. Union Density 2008	0.01	0.04	0.20	0.22	-0.04	0.02	0.37	0.25	0.25	-0.22	0.21	0.21	1.00											
34. Union Density 2006	0.01	0.02	0.23	0.20	-0.01	0.01	0.36	0.20	0.19	-0.18	0.18	0.18	0.94	1.00										
35. Labor Relations 2006	0.01	0.00	-0.19	-0.13	0.17	0.14	-0.15	-0.09	-0.13	0.16	0.03	0.03	-0.29	-0.25	1.00									
36. Export in Total Sales 2008	0.17	0.18	-0.04	-0.02	-0.08	-0.20	-0.13	-0.08	-0.05	0.04	-0.18	-0.18	-0.09	-0.11	0.05	1.00								
37. Export in Total Sales 2006	0.18	0.18	-0.02	-0.02	-0.09	-0.25	-0.17	-0.05	-0.01	0.08	-0.13	-0.14	-0.15	-0.17	0.08	0.90	1.00							
38. Product Demand Change 2007-2008	-0.12	-0.09	0.14	0.12	0.01	0.00	0.08	0.09	0.10	0.07	0.05	0.05	-0.03	-0.01	-0.12	0.12	1.00							
39. Org. Structure Change 2007-2008	-0.14	-0.27	0.22	0.17	0.19	0.03	-0.03	0.07	0.06	0.06	0.05	0.05	-0.07	-0.04	-0.02	-0.10	-0.12	0.15	1.00					
40. Manufacturing ^b	0.19	0.21	-0.04	-0.02	-0.18	-0.11	0.21	-0.17	-0.15	-0.06	-0.26	-0.26	0.02	-0.02	0.03	0.51	0.51	-0.01	-0.13	1.00				
41. Media & IT Service ^b	-0.16	-0.15	-0.12	-0.13	0.09	0.08	-0.29	-0.09	-0.10	0.21	-0.05	-0.05	-0.14	-0.12	0.03	-0.24	-0.24	0.01	0.06	-0.59	1.00			
42. Financial Service ^b	-0.12	-0.13	0.25	0.25	0.13	0.13	0.05	0.40	0.38	-0.10	0.53	0.53	0.29	0.32	-0.03	-0.36	-0.33	0.05	0.09	-0.51	-0.09	1.00		
43. Other Service ^b	-0.01	-0.05	-0.05	-0.07	0.07	-0.04	-0.07	-0.01	-0.02	-0.10	-0.04	-0.04	-0.17	-0.16	-0.06	-0.23	-0.25	-0.04	0.05	-0.48	-0.08	-0.07	1.00	

Note: N=176. Br. =Billion Korean Won. a. = Natural logarithm. b.= Dummy variable.

Table 3.5: Regression Results in the Relationship between HPWSs and Productivity

DV: Productivity _{t+1} ^b	(1)	(2)	(3)	(4)	(5)
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes
Productivity _t ^b	0.329*** (0.072)	0.349*** (0.072)	0.348*** (0.072)	0.365*** (0.070)	0.366*** (0.071)
Total Asset _t	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Union Density _t	0.089 (0.320)	0.028 (0.322)	0.082 (0.322)	0.038 (0.314)	-0.008 (0.325)
Export in Total Sales _t	0.006 (0.046)	0.013 (0.046)	0.014 (0.046)	0.015 (0.044)	0.011 (0.045)
Differentiation Strategy (STG) _t	0.020 (0.062)	-0.007 (0.063)	-0.022 (0.063)	-0.004 (0.061)	-0.006 (0.062)
HPWS _t × STG _t		-0.141* (0.065)	-0.135* (0.065)	-0.086 (0.065)	-0.097 (0.067)
HPWS _t ^{a b}		0.110* (0.064)	0.107* (0.064)	0.072 (0.063)	0.080 (0.136)
PLASH _t ^b			-0.061+ (0.033)	-0.050 (0.033)	-0.050 (0.033)
HPWS _t × PLASH _t ^a				0.083** (0.027)	0.075** (0.030)
Avg. HR Experience of HR Staffs _t ^b (Avg. HR Experience _t)					-0.025 (0.034)
HPWS _t × Avg. HR Experience _t					-0.013 (0.032)
Degree of HR Specialization _t ^b					-0.040 (0.038)
HPWS _t × Degree of HR Specialization _t					0.004 (0.032)
Constant	-0.429 (0.265)	-0.405 (0.263)	-0.376 (0.262)	-0.393 (0.255)	-0.411 (0.260)
Observations	352 (176) ^c				
Adjusted R ²	0.912	0.913	0.914	0.918	0.917
F	21.017***	21.148***	21.347***	22.374***	21.622***

Note: Standard errors in parentheses. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

t= Fiscal Year 2006 and 2008.

a. One tail test only for HPWS and HPWS × PLASH. Two tail test for the others.

b. HPWS, Productivity, PLASH, Avg. HR Experience of HR Staffs, and Degree of HR Specialization were standardized.

c. 176 firms were included in the analysis twice.

Table 3.6: Regression Results in the Relationship between HPWSs and ROS

DV: ROS _{t+1} ^b	(1)	(2)	(3)	(4)	(5)
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes
ROS _t ^b	0.235*** (0.032)	0.237*** (0.033)	0.237*** (0.034)	0.243*** (0.033)	0.246*** (0.034)
Total Asset _t	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Union Density _t	0.136 (0.341)	0.181 (0.347)	0.180 (0.349)	0.146 (0.346)	0.135 (0.359)
Export in Total Sales _t	0.104* (0.049)	0.106* (0.049)	0.106* (0.049)	0.107* (0.049)	0.109* (0.049)
Differentiation Strategy (STG) _t	0.049 (0.065)	0.041 (0.067)	0.042 (0.068)	0.056 (0.067)	0.058 (0.068)
HPWS _t × STG _t		-0.037 (0.072)	-0.037 (0.072)	-0.002 (0.073)	-0.001 (0.075)
HPWS _t ^{a,b}		-0.027 (0.070)	-0.027 (0.070)	-0.052 (0.071)	-0.069 (0.074)
PLASH _t ^b			0.001 (0.036)	0.008 (0.036)	0.008 (0.037)
HPWS _t × PLASH _t ^a				0.061* (0.030)	0.048+ (0.033)
Avg. HR Experience of HR Staffs _t ^b (Avg. HR Experience _t)					0.004 (0.038)
HPWS _t × Avg. HR Experience _t					-0.010 (0.036)
Degree of HR Specialization _t ^b					0.007 (0.042)
HPWS _t × Degree of HR Specialization _t					0.040 (0.036)
Constant	-0.342 (0.283)	-0.345 (0.283)	-0.346 (0.285)	-0.369 (0.282)	-0.369 (0.287)
Observations	352 (176) ^c				
Adjusted R ²	0.366	0.363	0.360	0.372	0.361
F	2.118***	2.094***	2.071***	2.122***	2.051***

Note: Standard errors in parentheses. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

t= Fiscal Year 2006 and 2008.

a. One tail test only for HPWS and HPWS × PLASH. Two tail test for the others.

b. HPWS, ROS, PLASH, Avg. HR Experience of HR Staffs, and Degree of HR Specialization were standardized.

c. 176 firms were included in the analysis twice.

Table 3.7: Regression Results in the Relationship between HPWSs and ROE

DV: ROE _{t+1} ^b	(1)	(2)	(3)	(4)	(5)
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes
ROE _t ^b	-0.208*** (0.042)	-0.213*** (0.044)	-0.211*** (0.044)	-0.213*** (0.044)	-0.221*** (0.045)
Total Num. of Employees _t	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Union Density _t	0.727 (0.628)	0.696 (0.638)	0.640 (0.639)	0.654 (0.640)	0.515 (0.658)
Export in Total Sales _t	-0.054 (0.085)	-0.056 (0.085)	-0.057 (0.085)	-0.057 (0.085)	-0.060 (0.086)
Differentiation Strategy (STG) _t	-0.065 (0.115)	-0.056 (0.117)	-0.040 (0.118)	-0.050 (0.119)	-0.037 (0.120)
HPWS _t × STG _t		0.051 (0.121)	0.045 (0.121)	0.018 (0.126)	0.011 (0.128)
HPWS _t ^{a,b}		-0.005 (0.120)	-0.004 (0.120)	0.016 (0.122)	-0.008 (0.128)
PLASH _t ^b			0.068 (0.064)	0.062 (0.064)	0.061 (0.065)
HPWS _t × PLASH _t ^a				-0.042 (0.053)	-0.082 (0.058)
Avg. HR Experience of HR Staffs _t ^b (Avg. HR Experience _t)					-0.049 (0.067)
HPWS _t × Avg. HR Experience _t					-0.005 (0.065)
Degree of HR Specialization _t ^b					-0.023 (0.074)
HPWS _t × Degree of HR Specialization _t					0.105+ (0.063)
Constant	0.254 (0.498)	0.256 (0.501)	0.221 (0.502)	0.235 (0.502)	0.178 (0.508)
Observations	352 (176) ^c				
Adjusted R ²	0.038	0.028	0.029	0.027	0.023
F	1.077	1.056	1.057	1.053	1.044

Note: Standard errors in parentheses. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

t= Fiscal Year 2006 and 2008.

a. One tail test only for HPWS and HPWS × PLASH. Two tail test for the others.

b. HPWS, ROE, PLASH, Avg. HR Experience of HR Staffs, and Degree of HR Specialization were standardized.

c. 176 firms were included in the analysis twice.

Table 3.8: Regression Results in the Relationship between HPWSs and ROA

DV: ROA _{t+1} ^b	(1)	(2)	(3)	(4)	(5)
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes
ROA _t ^b	0.124* (0.049)	0.124* (0.050)	0.118* (0.050)	0.119* (0.050)	0.118* (0.051)
Total Num. of Employees _t	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Union Density _t	0.658 (0.629)	0.702 (0.637)	0.614 (0.638)	0.610 (0.640)	0.425 (0.658)
Export in Total Sales _t	0.035 (0.086)	0.036 (0.086)	0.033 (0.086)	0.033 (0.086)	0.035 (0.087)
Differentiation Strategy (STG) _t	0.095 (0.116)	0.097 (0.118)	0.120 (0.119)	0.122 (0.120)	0.144 (0.121)
HPWS _t × STG _t		0.015 (0.121)	0.010 (0.121)	0.016 (0.126)	-0.001 (0.128)
HPWS _t ^{a,b}		-0.057 (0.120)	-0.055 (0.120)	-0.059 (0.122)	-0.035 (0.128)
PLASH _t ^b			0.097 (0.064)	0.098 (0.064)	0.101 (0.066)
HPWS _t × PLASH _t ^a				0.010 (0.053)	0.003 (0.059)
Avg. HR Experience of HR Staffs _t ^b (Avg. HR Experience _t)					-0.055 (0.068)
HPWS _t × Avg. HR Experience _t					0.076 (0.065)
Degree of HR Specialization _t ^b					-0.022 (0.074)
HPWS _t × Degree of HR Specialization _t					0.044 (0.063)
Constant	-0.309 (0.502)	-0.314 (0.504)	-0.356 (0.503)	-0.359 (0.505)	-0.455 (0.511)
Observations	352 (176) ^c				
Adjusted R ²	0.314	0.307	0.312	0.308	0.304
F	1.886***	1.848***	1.865***	1.844***	1.812***

Note: Standard errors in parentheses. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

t= Fiscal Year 2006 and 2008.

a. One tail test only for HPWS and HPWS × PLASH. Two tail test for the others.

b. HPWS, ROA, PLASH, Avg. HR Experience of HR Staffs, and Degree of HR Specialization were standardized.

c. 176 firms were included in the analysis twice.

Table 3.9: Regression Results in the Relationship between HPWSs and Firm Performance

Dependent Variables :	(1) Productivity 2008 ^b	(2) ROS 2008 ^b	(3) ROE 2008 ^b	(4) ROA 2008 ^b
HPWS 2006 ^{a,b}	0.174** (0.061)	0.295** (0.093)	0.109 (0.137)	0.087 (0.146)
PLASH 2006 ^b	0.031 (0.038)	0.070 (0.059)	-0.022 (0.086)	0.038 (0.092)
HPWS 2006 × PLASH 2006 ^a	0.009 (0.038)	0.015 (0.061)	-0.085 (0.088)	-0.005 (0.094)
Avg. HR Experience of HR Staffs 2006 ^b (Avg. HR Experience)	0.017 (0.036)	-0.057 (0.057)	0.038 (0.083)	0.026 (0.089)
HPWS 2006 × Avg. HR Experience 2006	-0.024 (0.035)	-0.088 (0.056)	-0.050 (0.081)	-0.004 (0.086)
Degree of HR Specialization 2006 ^b	-0.053 (0.037)	-0.069 (0.059)	-0.003 (0.087)	0.036 (0.094)
HPWS 2006 × Degree of HR Specialization 2006	-0.019 (0.037)	-0.116* (0.058)	0.031 (0.083)	-0.075 (0.089)
Differentiation Strategy (STG) 2006	-0.176* (0.073)	-0.226+ (0.116)	-0.173 (0.168)	-0.104 (0.180)
HPWS 2006 × STG 2006	-0.166* (0.068)	-0.178 (0.108)	-0.027 (0.157)	0.038 (0.168)
Firm Size 2006 ^c	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Union Density 2006	0.132 (0.123)	-0.015 (0.192)	0.498+ (0.278)	0.456 (0.297)
Export in Total Sales 2006	0.060* (0.026)	0.045 (0.041)	-0.033 (0.060)	0.010 (0.064)
Product Demand Change from 2007 to 2008	0.117*** (0.033)	0.041 (0.053)	-0.029 (0.077)	0.010 (0.082)
Change in Organizational Structure from 2007 to 2008	0.012 (0.044)	0.024 (0.069)	0.097 (0.101)	0.008 (0.108)
Firm Age	0.006 (0.040)	0.126* (0.063)	0.059 (0.092)	0.051 (0.098)
Media & IT Service	0.006 (0.128)	0.022 (0.202)	-0.134 (0.292)	-0.422 (0.314)
Financial Service	0.282 (0.180)	0.133 (0.275)	0.062 (0.380)	-0.244 (0.409)
Other Service	-0.023 (0.149)	0.937*** (0.234)	0.641+ (0.343)	0.727* (0.364)
Productivity 2006 ^b	0.782*** (0.039)			
ROS 2006 ^b		0.032 (0.059)		
ROE 2006 ^b			0.022 (0.064)	
ROA 2006 ^b				0.153+ (0.086)
Constant	-0.132 (0.177)	-0.037 (0.281)	-0.270 (0.408)	-0.101 (0.436)
Observations	176	176	176	176
Adjusted R ²	0.830	0.161	-0.002	0.032
F	45.817***	2.771***	0.979	1.301

Note: Standard errors in parentheses. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

a. One tail test only for HPWS, PLASH and HPWS × PLASH. Two tail test for the others.

b. The variables were standardized.

c. For Models 1 and 2, firm size was measured by total asset. For the others, firm size was measured by total number of employees.

Table 3.10: Regression Results in the Relationship between HPWSs and PLASH

DV: PLASH 2008 ^b	(1)	(2)
HPWS 2006 ^{a b}	0.209** (0.075)	0.098+ (0.075)
Labor_Relations 2006	0.031 (0.064)	-0.022 (0.062)
Union Density2006	0.506* (0.239)	0.366 (0.229)
Num. of HR Staffs per Employee 2006	-0.604 (6.033)	-0.172 (5.727)
Avg. HR Experience of HR Staffs 2006	-0.009 (0.021)	0.002 (0.020)
Degree of HR Specialization 2006	-0.031 (0.085)	-0.043 (0.080)
Change in Organizational Structure from 2007 to 2008	0.159+ (0.082)	0.098 (0.079)
Total Asset 2006	0.000 (0.000)	0.000 (0.000)
Firm Age	0.002 (0.004)	0.000 (0.004)
Media & IT Service	0.020 (0.226)	0.150 (0.216)
Financial Service	-0.339 (0.305)	-0.223 (0.290)
Other Service	-0.201 (0.259)	-0.080 (0.247)
PLASH 2006 ^b		0.298*** (0.068)
Constant	-0.590 (0.480)	-0.209 (0.463)
Observations	176	176
Adjusted R ²	0.114	0.202
F	2.877**	4.408***

Note: Standard errors in parentheses.

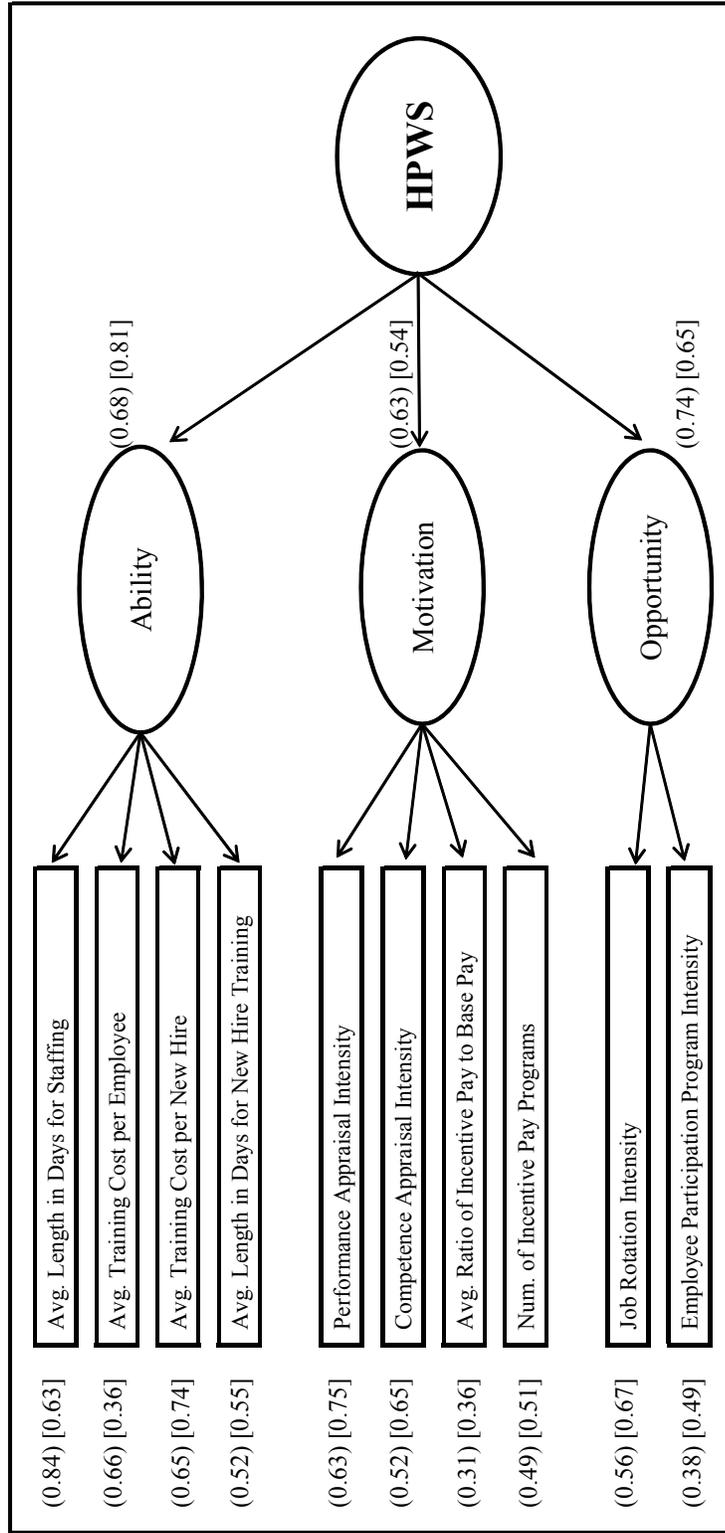
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

a. One tail test only for HPWS and two tail test for the others.

b. HPWS and PLASH were standardized.

FIGURES

Figure 3.1: Conformatory Factor Analyses for High Performance Work System Scale 2006 and 2008



Note : The parentheses have the standardized regression weights of HPWS 2006, estimated under the constraint of equal measurement weights and structural weights in two fiscal years.
 The square brackets have the standardized regression weights of HPWS 2008, estimated under the constraint of equal measurement weights and structural weights in two fiscal years.
 All the estimated weights are significant ($p \leq 0.002$).

Figure 3.2: PLASH and HPWS Interaction for Productivity

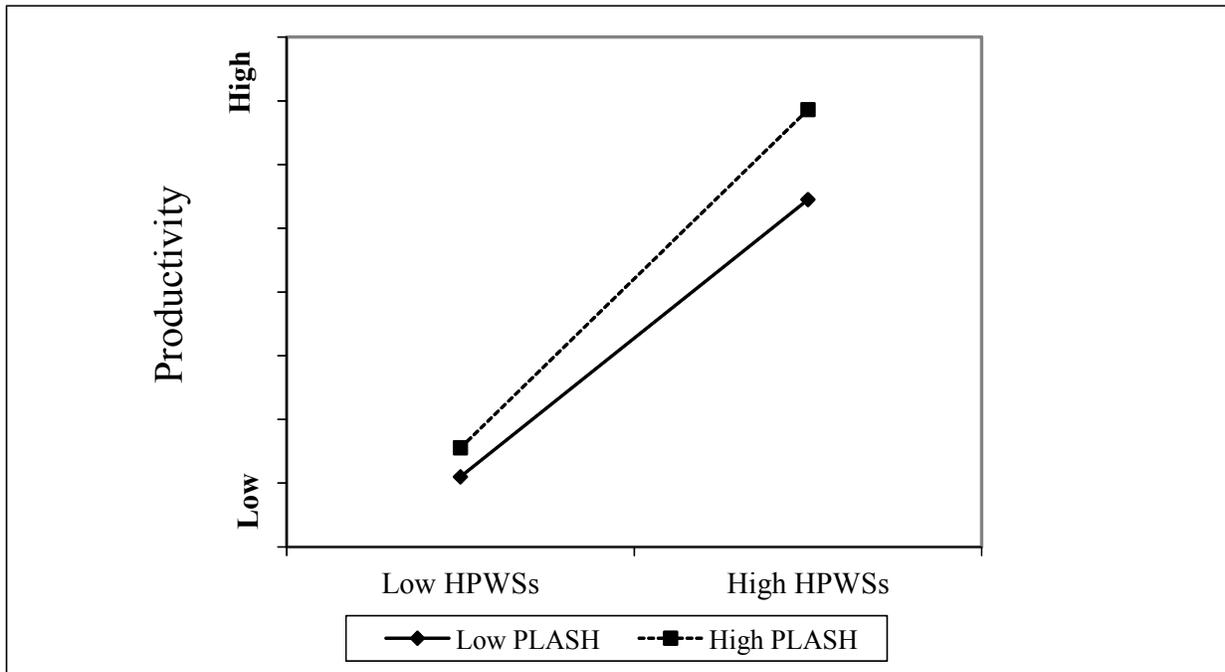
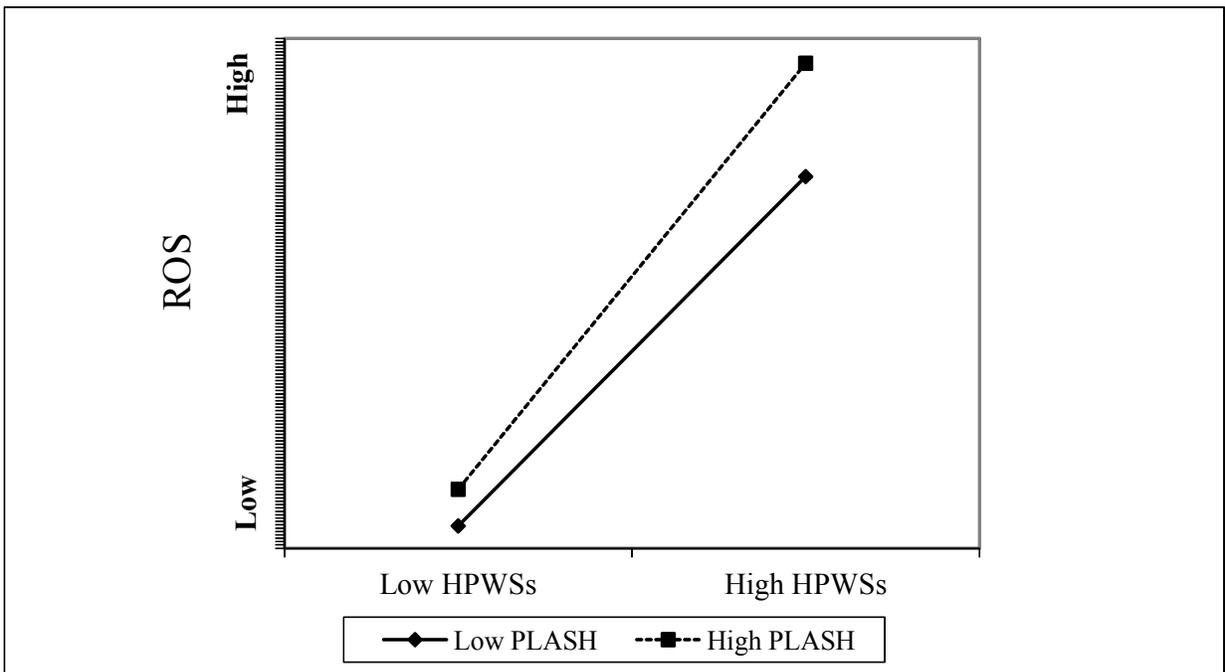


Figure 3.3: PLASH and HPWS Interaction for ROS



CHAPTER 4

CONCLUSION

In search of the *raison d'être* of human resource management, significant research efforts have been exerted, returning only evidences of positive associations between HPWSs and firm performance. Nonetheless, many of scholars in the field of strategic human resource management have explicitly or implicitly regarded the evidences of positive association as evidences of causation from HPWSs to firm performance, finding theoretical supports largely from a resource based view of a firm(Barney, 1991; Wernerfelt, 1984), and denying possibilities of other causal directions. On the other hand, however, the interpretation of the positive association as causation has suffered from the criticisms drawn from various perspectives of organizational studies which may suggest opposite direction of causality and/or nullify the claim of HPWSs' efficacy. Thus, to fill the research gap and reconcile concerns raised by the each side of the debates on the causal mechanism in the HPWSs-firm performance relationship, the current study focused on investigating the causal directions in the relationship, drawing from multiple theories and perspectives, in the study presented in Chapter2.

Connected with the question of causal mechanism, the current study also focused on the implementation processes of HPWSs. The size of performance gain accruing from adopted HR systems may vary, depending on how effectively the adopted HR systems were implemented. Thus, the investigation of the effect of HPWSs should take into account the effectiveness of HPWS implementation which may vary across firms; however, prior studies largely omitted considering possibility of organizational heterogeneity in ability of HR system implementation, assuming automatic following of effective implementation. Drawing from the process

perspective (Bowen & Ostroff, 2004; Sanders & Frenkel, 2011), the current study focused on the roles of HR staff-employee interactions in the causal relationship between HPWSs and firm performance, in Chapter 3.

In Chapter 2, the current study suggested a causal direction from firm performance to HPWS utilization, and examined both directions of causality in HPWSs-firm performance relationship, simultaneously. Although the test results varied depending on the type of firm performance examined, the study found reciprocal causality between HPWSs and productivity. In addition, the study found the causal directions from HPWSs to ROS and ROE, which support the 'Holy Grail' claim. The study presented in Chapter 2 also examined the influence from the prior level of HPWS utilization on the causal relationship between firm performance and HPWS utilization, but did not find supporting evidence, meaning that the influence of prior firm performance on HPWS utilization may not be affected from the prior level of HPWS utilization.

In Chapter 3, the current study proposed and examined moderating roles of HR staff-employee communication, employee perception of HR staff as strategic partners, and employee perception of HR staff as change agents in the causal relationship between HPWSs and firm performance. The current study found that the proposed organizational factors, which were highly inter-correlated, moderated the HPWSs-productivity relationship and the HPWSs-ROS relationship in positive ways, as one moderating factor. In addition, the current study also found causal relationship between HPWSs and the moderating factor.

LIMITATIONS

The current dissertation study is not free from limitations. First, the examinations of causality with cross-lagged effect models are not free from the possibility of omitted variable

bias, which would occur when an unobserved variable is associated with both predicting and dependent variables. While the models examining causal direction from HPWSs to various aspects of firm performance controlled firm level fixed effect, the nature of the data for the current study did not allow using the fixed effect model in the examinations of the causal relationships between firm performance and HPWS utilization and the causal relationship between HPWS utilization and PLASH. If there are unobserved factors that positively affect both firm performance and HPWS utilization, and both HPWS utilization and PLASH, the validities of the causal relationships could be threatened. Future research with more waves of panel data and more rigorous model specification would overcome the threat of omitted variable bias.

Second, although the current dissertation study maintained theoretical supports for both causal directions between HPWSs and firm performance, moderating role of PLASH in the causal relationship between HPWSs and firm performance, and the causal relationship between HPWSs and PLASH, examinations of the hypothesized relationships were limited to testing direct relationships among the principal variables; the processes in the relationships that the theoretical frameworks suggested were not examined. In examination of the causal relationship between HPWSs and firm performance, future research testing various mediating constructs related to employee ability, motivation, strategic value creating behaviors, or organizational climate that would develop or promote the formers, would provide more in-depth understanding of the causal relationship between HPWSs and firm performance. Connected, models including measures on organizational climate as mediators would also allow more clear delineations of the mechanisms through which PLASH influences the relationship between HPWSs and firm performance relationship. Furthermore, models with measures on employee's understanding on HR systems and willingness to cooperate with HR staffs would also contribute to revealing the

process through which PLASH promotes generation of strong organizational climate. In examination of the causal relationship between firm performance and HPWSs, measures on both absorbed and unabsorbed organizational slack resources (Singh, 1986) would allow direct examination of the theories supporting the hypothesized relationship between firm performance and HPWSs, and would provide more clear understanding on the role of firm performance in HPWS adoption. In examination of the causal relationship between HPWSs and PLASH, future research that would uncover whether HPWS utilization promote PLASH by signaling HR function's power status or by presenting certain types of beneficiary outcomes from HPWS utilization (Guthrie et al., 2011), would augment our understanding on the causal relationship between HPWSs and PLASH.

Finally, the findings of the current dissertation study that utilized data collected from Korea may not be applicable to other national contexts. As previously mentioned, a growing number of empirical studies in the field of human resource studies have provided evidence supporting the invariance of study results between studies conducted in the U.S. and those in other countries (e.g. Bae et al., 2003; Bae & Lawler, 2000; Guthrie, 2001; Razouk, 2011; Sun et al., 2007; Takeuchi et al., 2007; Wu et al., 2011). However, the current dissertation study is one of pioneering research examining causal directions rather than association between HPWSs and firm performance. Further, there are only few studies, if not none, that examine the moderating role of PLASH in HPWSs-firm performance relationship, and the influence of HPWSs on PLASH. Thus, accumulation of evidences from more research in other national contexts is needed to achieve the generalizability of the findings from the current study, and to enhance our understanding of the relationships among HPWSs, firm performance, and PLASH.

FUTURE RESEARCH

The current dissertation study also suggests more of future research questions. First, in examination of HPWSs-firm performance relationship, the time dependencies of HPWSs' impact on various aspects of firm performance and firm performance's impact on HPWS utilization via organizational slack resources are still not comprehensively known. Especially, the time-lag for realization of HPWSs' impact on diverse dimensions of firm performance may vary from more proximal aspects of firm performance to more distal aspects of firm performance. Likewise, the time lag between HPWS utilization and elevation of PLASH is still not fully uncovered. Thus, the current study calls for future research that would allow direct examinations of the time dependency in the relationship between HPWSs and various dimensions of firm performance, and the relationship between HPWSs and PLASH.

Second, the mechanism through which prior firm performance affects HPWS utilization is not much uncovered. Future research endeavor considering decision making mechanisms through which organizational slack resources are allocated into various organizational functions would provide more clear understanding on the impact of firm performance on HPWS utilization, and may explain why only impact of labor productivity on HPWS utilization was observed in the current study. In addition, more research on various antecedents of HR practice or HR system adoption would advance the SHRM literature that has disproportionately concentrated on studies on the efficacy of HR systems in firm performance.

Third, although the test results of the current study were negative or mixed, future research on the influence of prior level of HPWS utilization on firm performance-HPWSs relationship, and the impact of prior level of firm performance on HPWSs-firm performance relationship would provide more comprehensive understanding on the causal relationships

between HPWSs and firm performance. Prior level of HPWS utilization may influence future HPWS investment in various ways, simultaneously. For instance, a firm could perceive opportunity for additional gains, but, also, it could expect diminishing efficacy of additional HPWS investment, as level of HPWS utilization grows. Similarly, prior level of firm performance may affect the magnitude of HPWSs' impact on future firm performance in multiple ways. Given the level of HPWS utilization, currently high performing firms could have better ability and harvest larger size of gains from the HR system than low performing firms. On the other hand, however, the high performing firms could have less room for additional performance enhancement than the low performing firms. The current study calls for future research that would explore these possible path-dependencies with more profound theoretical foundation and more rigorous model specification.

Fourth, the finding of high inter-correlation among the items on HR staff-employee communication and employee perception of HR staff's status suggests more research on the relationship between them. Employee perception of HR staffs could be developed through HR-employee communications (Galang & Ferris, 1997), or employees could evaluate the effectiveness of HR-employee communication based on their preoccupied impressions of HR staffs. Other than these possibilities, various alternative explanations may exist, and future studies would augment our understanding on employee perception on HR staffs, and, in turn, the mechanisms of HR system implementation.

Finally, the current study utilized labor productivity as an operational firm performance measure, and ROS, ROE, and ROA as financial firm performance measures, since they have been often utilized in prior research of human resource management and strategic management, and, also, the current study utilized data collected from various industries. However, firm

performance could also be measured in various other ways. For instance, Huselid (1995) utilized Tobin's q and gross rate of return on capital, GRATE, and Cappelli and Neumark (2001) used the log of the inverse of unit labor costs, as performance measures. Further, in industry specific studies, more direct performance measures that reflect the contexts of the industries could be utilized. For instance, in his study on steel minimills, Arthur (1994) utilized average number of labor hours required to produce one ton of still at a mill, and the number of tons of raw steel that had to be melted to produce one ton of finished product, as performance measures. Future studies utilizing other types of firm performance measures that could be more proximal outcomes of human resource management would allow more comprehensive understanding on HPWSs-firm performance relationship. More importantly, operationalizing the concept of competitive advantage in studies on the efficacy of HR systems would also advance the SHRM literature. The majority of prior studies on the relationship between HPWSs and firm performance and the current study have drawn their theoretical foundations largely from a resource based view of a firm (Barney, 1991; Wernerfelt, 1984) that concerns on strategic value of organizational resources for sustainable competitive advantage, in other words, sustaining above average performance in a firm's competing market. However, these studies only focused on enhancement of absolute level of firm performance, rather than firm performance relative to competing other firms. Future research with data allowing identification of a firm's competing peers as well as controlling of a firm's competitive advantage generated from market structure (Hoopes, Madsen, & Walker, 2003) would provide opportunity of examining HPWSs' impact on competitive advantage. Further, future studies with longitudinal data would allow examination of HPWSs' efficacy in sustainability of competitive advantage of a firm.

CONCLUDING REMARKS

Notwithstanding the limitations and the remaining research gaps, the two separate but interrelated studies presented in Chapters 2 and 3 have several overarching contributions to the literature. First, in Chapter 2, the current study showed that HPWSs results in firm performance enhancement. In Chapter 3, the current study showed that the size of the performance gain depends on the context of each firm. By providing these missing pieces, the current dissertation study complements existing SHRM literature. Second, in Chapter 2, the current dissertation study showed that firm performance also results in HPWS utilization, such that the latter results in the former. In Chapter 3, the current study demonstrated that HPWS adoption promotes an organizational context that is conducive to effective HPWS implementation. By demonstrating these co-evolutionary relationships, the current dissertation extended parameters of current SHRM research framework.

In conclusion, human resource management matters. Use of advantageous HR systems increases firm performance, and better ways of using the HR systems add more performance gains. The findings of the current dissertation study, however, suggest that more comprehensive understanding of the organizational phenomena requires conversations between multiple disciplines and perspectives.

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APPENDIX

Appendix A: Items for High Performance Work System Scales

<u>Items</u>	<u>Formula</u>
<i>Extensive Staffing and Training</i>	
1. Avg. Length in Days for Staffing :	Average number of days from job posting to job offer.
2. Avg. Training Cost per Employee:	Total training cost / Total number of employees.
3. Avg. Training Cost per New Hire:	Total cost of new hire training / total number of new hire.
4. Avg. Length in Days for New Hire Training:	Average number of days of new hire training.
<i>Intensive appraisal and pay-for-Performance</i>	
5. Performance appraisal intensity:	Number of grading levels in performance appraisal.
6. Competence appraisal intensity:	Number of grading levels in competence appraisal.
7. Average Ratio of Incentive Pay to Base Pay:	Performance-based- bonus / base salary and fixed annual bonus.
8. Number of Incentive Pay Programs:	Number of implemented practices among individual based incentives, team based incentives, division based incentives, organization based incentives, profit sharing, and gain sharing.
<i>Employee participation and Opportunity</i>	
9. Job Rotation Intensity:	5 point rating system ranging from 0 to 4.
10. Employee Participation Program Intensity:	Aggregation of the implementation intensity of idea-suggestion, knowledge-mileage, quality circle, TQM and six-sigma practice, each measured in 5 point rating system ranging from 0 to 4.

Appendix B: Survey Items for Perceived Legitimate Authority Status of HR Staff Scales

(Five anchored Likert items ranging from "strongly disagree" to "strongly agree")

HR-Employee Communication

- "HR department provides education and advice on HR related issues to line managers."
- "HR department frequently explains contents of HR systems to employees"

Strategic Partner Perception

- "HR department contributes significantly in the process of business strategy planning"
- "HR department affects significantly CEO's decision making."

Change Agent Perception

- "HR department plays a leading role in consistent improvements and enforcements of HR systems."
- "HR department plays a leading role in organizational change and innovation."