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Jake G. Messersmith
University of Nebraska–Lincoln, jmessersmith2@unl.edu

Kyoung Yong Kim
City University of Hong Kong, kimky.yong@cityu.edu.hk

Pankaj C. Patel
Villanova University, pankaj.patel@villanova.edu

Pulling in different directions? Exploring the relationship between vertical pay dispersion and high-performance work systems

Jake G. Messersmith,[1] Kyoung Yong Kim,[2] & Pankaj C. Patel[3]

1 University of Nebraska–Lincoln, Lincoln, Nebraska
2 City University of Hong Kong, Kowloon, Hong Kong
3 Villanova School of Business, Villanova University, Villanova, Pennsylvania

Corresponding author — Jake Messersmith, Associate Professor of Management, University of Nebraska–Lincoln, 1240 R Street, Lincoln, Nebraska 68588. email jmessersmith2@unl.edu

ORCID
Kyoung Yong Kim   http://orcid.org/0000-0002-1917-6781
Pankaj C. Patel   http://orcid.org/0000-0003-4934-8166

Abstract
Vertical pay dispersion (VPD), a hierarchical pay structure used to motivate employees, has traditionally been studied separately from high-performance work systems (HPWSs). As a component of HPWSs, incentive-based compensation schemes focus on employee- or team-level incentives. However, the influence of the simultaneous utilization of VPD and HPWS on performance remains understudied. This study addresses the question of whether these approaches to managing human capital serve as complements or substitutes to one another. VPD and HPWS are argued to substitute for one another with respect to motivation- and skill-enhancing practices. The opposite notion is true in regard to opportunity-enhancing HPWSs, which serve to amplify the effectiveness of VPD. In a multisource, longitudinal sample of South Korean firms, the hypothesized predictions are supported.

Keywords: contingency theory, high-performance work systems, strategic HRM, tournament theory, vertical pay dispersion

1 Introduction

Pay dispersion refers to the pattern of pay differential across and within different levels of the organizational hierarchy (Bloom, 1999; Bloom & Michel, 2002; Messersmith, Guthrie, Ji, & Lee, 2011; Milkovich & Newman, 2005). Vertical pay dispersion, in particular, focuses on the disparity in pay across different levels in the organization (Cowherd & Levine, 1992; Kepes, Delery, & Gupta, 2009). Vertically dispersed pay structures have received significant criticism in the literature for creating a culture of competition, feelings of relative deprivation (Crosby, 1976), and concern that they suppress teamwork and collaboration (Akerlof & Yellen, 1988; Ferraro, Pfeffer, & Sutton, 2005; Levine, 1991; Pfeffer & Langton, 1993). However, VPD also provides tournament-type payoffs, and the efficacy of such systems is broadly supported in labor economics (Lazear & Rosen, 1981). In fact, VPD is a viable incentive tool among many firms across multiple sectors and remains an efficacious tool to seek and allocate talent by facilitating sorting among employees (Gerhart & Fang, 2014). As such, vertically dispersed pay structures remain the modal system in many industries and organizations (Connelly, Tihanyi, Crook & Gangloff, 2014; Conyon, Peck, & Sadler, 2001; Eriksson, 1999).

In approaching the topic of VPD, we adopt the view espoused by Shaw (2014) in noting "the legitimacy and justifiability of pay dispersion" (p. 534). Such a view acknowledges that pay dispersion is neither universally beneficial nor detrimental, but that the effect of dispersed pay structures is contingent on a host of internal and external factors. Therefore, while the theorized organizational benefits of VPD are contingent upon proper implementation, they are possible given proper alignment with other system characteristics (Shaw, 2014; Trevor, Reilly, & Gerhart, 2012).

As firm-level practices, both VPD and HPWSs aim to increase employee ability and motivation, ultimately in an attempt to improve firm performance. HPWSs also aim to enhance the ability and motivation of human capital while unlocking opportunities for employees to demonstrate their talent (Appelbaum, Bailey, Berg, & Kalleberg, 2000; Jiang, Lepak, Hu, & Baer, 2012). HPWSs include a complete menu of human resource practices ranging from extensive recruitment and selective staffing to intensive training and development programs,

performance evaluation, merit-based pay, and employee participation programs (Huselid, 1995; Takeuchi, Lepak, Wang, & Takeuchi, 2007). Therefore, HPWSs represent an integrated approach to acquiring and managing human capital, while VPD focuses on building a promotion and compensation structure that serves to signal, sort, and incentivize employees, apart from other HRM elements.

This raises a natural question regarding the interplay between these two sets of practices and whether they enhance or detract from one another. Although the effects of VPD on performance are mixed and widely debated, we ask whether HR practices may complement or hinder the efficacy of VPD in influencing firm performance. Both VPD and HPWS aim to improve the human capital available to the firm. VPD focuses on building hierarchical pay structures with strong incentives for individuals to "compete" for promotions up the organizational ladder, where the gap between pay levels increases disproportionately with each successive promotion. The logic suggests that steep corporate tournaments attract bright and talented employees who are then motivated to apply their talent in order to receive substantial rewards as they move up the corporate ladder (Lazear & Rosen, 1981). Hierarchical pay structures are also viewed as a tool to efficiently allocate risk. As individuals rise in the hierarchy, they face greater risk and their compensation is generally more variable. This allows the organization to shift risk to employees, while also allocating significant rewards to those at the top of the hierarchy who bear the greatest risk (Nalbantian, Guzzo, Kieffer, & Doherty, 2003).

Bridging the two streams of literature—VPD and HPWSs—we build upon the growing work in both areas to better understand the relationship between vertically dispersed pay structures and HPWSs. Specifically, we address the theoretical mechanisms through which both VPD and HPWSs operate to affect performance to determine if VPD and HPWSs complement one another or substitute for one another. We specifically note the underlying differences in VPD and HPWS, as VPD theoretically injects competition within the firm, while HPWSs are espoused to produce collaboration. We further discuss the redundancies that may be created when simultaneously utilizing VPD and HPWSs. By invoking two systems to achieve one result, the organization may be creating cost inefficiencies that place it at a competitive disadvantage. We highlight the tension between these two forces both

theoretically and empirically. Further, the system of high-performance work practices is decomposed to test the interactive effects of VPD and skill-, motivation-, and opportunity-enhancing HPWSs on the above-mentioned performance variables. This is an important area of inquiry, as many organizations simultaneously leverage hierarchical pay structures and HPWSs. Determining whether this results in an optimal combination for firm performance is a question of theoretical and practical significance.

This article contributes to the management literature in a number of ways. Most notably, it builds upon strategic HR research focusing on the configurational and contingent nature of management practice implementation (Delery & Doty, 1996; Huselid & Becker, 2010; Lepak & Shaw, 2008). While both VPD and HPWSs have been demonstrated to offer beneficial organizational outcomes, they may not necessarily work well together to produce desired behavioral effects. Therefore, the article addresses a practically meaningful question in attempting to understand the challenges associated with integrating HPWSs into vertically dispersed pay structures. Addressing this tension within the system and untangling the motivational properties of each add value to the literature and guidance to practice. While existing work has examined the influence of pay dispersion in combination with other characteristics of the compensation system (Shaw, Gupta, & Delery, 2002), to our knowledge no study to date has attempted to disentangle the effects of pay structure choices as combined with a "typical" HPWS. The results have clear policy implications for firms seeking to assess gains from a hierarchically dispersed pay structure and the implementation of other skill-, motivation-, and opportunity-enhancing HR practices.

Second, we examine the more nuanced relationships between HPWSs and VPD by investigating the manner in which VPD interacts with the three subsystems of HPWSs related to skill, motivation, and opportunity enhancement. This provides a more contextualized view of the relationship between VPD and the key levers and mechanisms within the HPWS. The results yield important information for both scholarship and practice as it relates to the implementation of pay structures and other management practices to achieve higher performance. In doing so, the study also addresses a need for developing a deeper understanding of the way in which individual HR practices

interact within the overall system of practices (Lepak & Shaw, 2008) and examines connections between micro and macro models in the field of HRM (Wright & Boswell, 2002). In particular, while the organizational sciences have begun to explore the micro-foundations of competitive advantage (i.e., Abell, Felin, & Foss, 2008; Coff & Kryscynski, 2011), we add to this discussion by looking at the "macrofoundations" of system alignment and fit.

Third, the article tests the propositions using a large, multiyear, multisource sample of firms across multiple industries in South Korea. The robustness of the data allows for meaningful comparisons across organizations and chronological spacing between the measurement of the independent variables and the dependent variables. While not conclusive, the evidence provided herein offers guidance to scholars and practitioners alike.

2   Attracting and Motivating Human Capital: VPD and HPWS

At the root, both work on HPWSs and VPD have emphasized the motivational elements of such practices. Pay dispersion research has typically been built on the theoretical framework of tournament theory. Tournament theory is a robust theoretical framework (see Connelly et al., 2014, for a recent review) with an underlying thesis pointing to the motivational value of disproportionate pay differences in relation to peers. As such, tournament theory emphasizes the value of steep pay hierarchies produced through contests in which organizational actors compete for promotion and rewards (Lazear & Rosen, 1981). This theory views all promotions within the organization as contests in which each individual employee is competing with others at their same level for promotion to the next rung of the corporate ladder. As one moves up the ladder, rewards become disproportionately greater, such that the pay increase from Level 2 to Level 3 is greater than from Level 1 to Level 2, and so on.

Tournament-type pay structures lead to both sorting and incentive effects (Conyon et al., 2001; Lazear & Rosen, 1981). Sorting effects refer to the ability of the firm to attract the best talent possible to the organization by offering a tournament structure of disproportionately increasing rewards. Such models argue that the best employees are

attracted to firms with steep pay structures. Sorting effects also allow organizations to let go of less valuable human capital as employees with lower chances of advancing in the tournament leave the firm. The incentive effect refers to the motivation that all employees enjoy as they attempt to move up the rungs of the hierarchy (Becker & Huselid, 1992). Tournament theory acknowledges that although the organization is likely paying those at the top of the hierarchy more than their marginal contribution to the firm, this effect is more than balanced by the fact that the organization is receiving contributions from lower level employees that exceed their cost. As aptly put by Lazear (1989, p. 226), "The salary of the vice president acts not so much as motivation for the vice president as it does as motivation for the assistant vice presidents."

In addition, tournament-based pay structures are also viewed as an efficient mechanism to allocate risk within the organization (Nalbantian et al., 2004). As employees are promoted through the hierarchy, they generally have greater levels of their compensation put at risk through incentive-based pay or equity-based pay. Those at the top tolerate this risk because of the disproportionate increase in the expected value of the reward. Similarly, those at lower rungs often have less compensation placed at risk, but also have lower potential payouts. As such, risk is shifted from the organization to employees more efficiently through tournament-based structures to ensure that those at the top are motivated to achieve firm-level objectives, which will likely boost their overall compensation package. This is further underscored when relative performance (i.e., performance compared to industry peers) is measured rather than absolute performance, as systemic exogenous risk is shifted to shareholders (or owners) and away from employees (Haig, Nalbantian, & Zheng, 2004).

VPD, therefore, is viewed as an important tool for motivating employees across the organizational hierarchy to ultimately improve the financial returns of the firm and to more efficiently allocate risk. *Ceteris paribus,* the larger the spread between levels, the greater the motivation for lower level employees to compete for promotions in an effort to earn the commensurate financial rewards. This effect has largely been supported in the literature on tournament theory, both within and outside of the field of management (Connelly et al., 2014). In fact, a host of studies within this stream of research have

demonstrated that greater levels of vertical pay dispersion are advantageous to generating financial returns for the organization (Brown, Sturman, & Simmering, 2003; Ding, Akhtar, & Ge, 2009; Garrett & Gopalakrishna, 2010; Hibbs & Locking, 2000; Kalra & Shi, 2001; Lee, Lev, & Yao, 2008; Poujol & Tanner, 2010).

Meanwhile, HPWSs have traditionally been defined as a constellation of aligned practices aimed at enhancing the ability and motivation of human resources, while also increasing the opportunities available to human resources to utilize their talent (Appelbaum et al., 2000; Jiang, Lepak, Hu, & Baer, 2012). This ability, motivation, opportunity (AMO) framework is based on the notion of social exchange, in which human resources seek to match their contributions to the rewards that they receive (Blau, 1964). This literature has generally found empirical support for the notion that human resources who are selected via rigorous selection processes are trained adequately, provided with development opportunities, given a voice in the organization, and compensated based upon merit will respond with commitment and engagement (Jackson, Schuler, & Rivero, 1989; Messersmith, Patel, Lepak, & Gould-Williams, 2011). Further, such systems build human and social capital within the firm, thereby leading to improved firm performance (Becker & Huselid, 1998; Combs, Liu, Hall, & Ketchen, 2006; Huselid & Becker, 2010; Lepak & Snell, 1999). This literature base has generally found support linking the utilization of HPWSs in various forms to financial performance (e.g., Combs et al., 2006; Delery & Shaw, 2001; Huselid, 1995; Wright, Gardner, Moynihan, & Allen, 2005).

2.1 Assessing the Effects of Combining HPWS and VPD

Given these different theoretical approaches to attracting, retaining, and motivating human capital, it is reasonable to ask how pay dispersion and HPWSs may interact with one another. We argue that HPWSs and VPD both work to motivate employees, but that the inclusion of HPWS in conjunction with VPD may not be optimal for boosting firm performance. The distinction between HPWSs and VPD lies in the underlying theories governing each system. HPWSs tend to be formulated on the basis of social exchange, providing individuals with rewards and advancement based on contributions and observed

performance. Utilizing a system of complementary HR practices is thought to produce greater levels of human capital in the firm and also to open avenues for employees to display greater discretionary effort (Bailey, 1993; Huselid, 1995; Takeuchi et al., 2007). Further, HP-WSs tend to be modeled as *commitment-based* systems, which promote strong psychological ties that are created between the individual and the organization, such that individual and organizational goals are properly aligned, increasing effort and maximizing the value of human capital (Arthur, 1994; Lepak & Shaw, 2008). Therefore, HPWSs are largely built on a system of equity in which employees are provided with tools to enhance their skills and ability, while also being given opportunities to maximize their own human capital to the betterment of both the individual and the firm. Such systems tend to be based on a general sense of fairness and social exchange. If an employee, individually, performs well, he/she will earn commensurate rewards.

As noted above, the benefit of implementing HPWs is generally based on building both human capital and social capital. The social capital aspects may be harmed by the inclusion of tournament structures that promote competition and detract from cooperation in interdependent environments (Becker & Huselid, 1992). In some cases, competition may create a sense of unfairness relative to others in the organization that may lead to the deliberate attempt to undermine other team members (Fredrickson, Davis-Blake, & Sanders, 2010; Lazear, 1989). In many ways, the pay practices typically included in HPWSs are aligned with equity theory (Wallace & Fay, 1983), which presents a compensation model suggesting that individuals compare the pay they receive to others based on the ratio of inputs/rewards for each. When the ratio is similar, equity is thought to be present, even if significant differences exist in absolute compensation.

VPD, on the other hand, is based on the logic of competition, where small differences in performance lead to significant differences in compensation and other rewards, all in an effort to optimize performance (Becker & Huselid, 1992; Connelly et al., 2014; Fredrickson et al., 2010; Heyman, 2005; Main, O'Reilly, & Wade, 1993). VPD places the emphasis on relative performance rather than absolute performance and sets up competitions across the organization. This means that employees are motivated to "win" by outperforming peers. Small increases in performance therefore lead to much greater rewards

(Connelly et al., 2014). In addition, VPD stands in contrast to equity-based models by explicitly providing individuals at the top of the organizational hierarchy greater rewards than their inputs may warrant.

As a result of these competing logics, we would expect that firms utilizing HPWSs and VPD simultaneously may see weakened firm financial performance. Utilizing HPWSs is costly, as it requires significant resource commitment and could be difficult to implement across all employee groups (Huselid & Becker, 2010), especially in smaller or newer firms (Way, 2002). As such, it is reasonable to expect that including HPWSs and VPD may actually weaken performance because of the cost associated with full-scale HPWS implementation. While this cost increase is generally negated by the overall benefit of ability-, motivation-, and opportunity-enhancement, the competing forces of VPD and HPWS may partially cancel this effect. Therefore, the firm no longer reaps the full benefit of dispersed structures.

In sum, the fundamental logic underscoring HPWSs and VPD as characteristics of an organizational system differs, possibly creating a suboptimal solution in which one aspect moves employees toward greater competition (VPD), while the other stresses commitment and collaboration (HPWS). While each is useful for incentivizing quality work, the attributes work across purposes, creating a suboptimal result when leveraged simultaneously. Therefore, we test the following:

> **Hypothesis 1:** *HPWSs will negatively moderate the relationship between VPD and organizational performance, such that an increased emphasis on HPWSs dilutes the effectiveness of VPD on firm performance.*

In addition to assessing the utilization of the entire set of practices, it is also important to examine the various components of the HPWS to determine the detrimental or complementary role that each may play in the relationship between VPD and firm performance. HPWSs represent a constellation of practices, some of which may operate well in conjunction with a vertically dispersed pay structure, while others operate across purposes, as noted above. To disentangle these effects, we follow Jiang, Lepak, Hu, & Baer (2012) in examining the three subcomponents of the HPWSs: skill-, motivation-, and opportunity-enhancing practices.

Skill-enhancing practices tend to be focused on building the knowledge, skills, and abilities (KSAs) of human capital. Typically, practices related to selective staffing and training have been included in measures of skill-enhancing HPWSs (Jiang, Lepak, Hu, & Baer, 2012). Selective staffing involves building extensive recruitment programs to attract the best talent while also setting up a series of employment tests to determine the candidate with the best KSA profile to perform a given job. Training, notably, involves identifying deficiencies in the selected candidates' KSAs and providing learning and knowledge-acquisition activities in order to ready the individual to perform the tasks, duties, and responsibilities of the job. Both selective staffing and intensive training are costly approaches to acquiring and selecting human capital. Each requires multiple steps, careful analysis, and trained evaluators to make decisions.

As noted, VPD builds in sorting effects, in which the best available talent is thought to seek after organizations with the steepest structures in order to compete for top "prizes" and higher levels of compensation. A vertically dispersed pay structure may produce wage premiums that can effectively eliminate, or at least reduce, the need for career advancement and internal promotion programs within the firm (Cappelli & Cascio, 1991). This arises as individuals are naturally incentivized by the pay structure to seek ever increasing rewards, lessening the need for more formal career development programs, job laddering, or other specific internal promotion policies. As Cappelli and Cascio (1991) note, the wage structure alone may be enough to create the internal labor market, without having to create redundancies with other HR practices aimed at motivating career advancement and ensuring a consistent pool of human capital within the firm. As such, if the sorting effects of a dispersed pay structure are effective, then adding selective staffing and extensive training opportunities may actually increase the firm's cost structure and dilute the benefits of VPD. We propose that combining skill-enhancing practices with VPD means that the organization is achieving suboptimal results, because of the increased costs associated with leveraging two sets of processes aimed at delivering the same results. Rather, firms that are able to capture the sorting effects of VPD are able to conserve financial resources by not investing as heavily in other skill-enhancing practices.

Hypothesis 2: *Skill-enhancing HPWSs will negatively moderate the relationship between VPD and organizational performance, such that an increased emphasis on HPWS dilutes the effectiveness of VPD on firm performance.*

Motivation-enhancing practices are those directly aimed at increasing the discretionary effort of employees. Such practices tend to include utilizing performance evaluation, pay for performance plans, paying above-market wages, and providing extensive employee benefits (Jiang, Lepak, Hu, & Baer, 2012). The relationship between VPD and HPWSs is most closely connected at the juncture of rewards and promotion, which are also core elements of tournament theory. As such, the relationship is likely to be overlapping and highly contextualized. Many pay systems common to HPWS will likely accentuate the effectiveness of HPWS. For instance, individual merit-based pay plans will likely enhance the effectiveness of VPD. Indeed, it is through the provisions of the merit-based system that the hierarchy is likely established. This will be further accentuated by individual bonus systems that are closely pegged to base salary. As such, individual reward schemes will likely operate to reinforce the effects of the hierarchical pay structure.1

However, many of the other motivation-enhancing practices common to HPWSs will likely align orthogonally with VPD. As noted above, tournament theory postulates that a firm can more efficiently motivate employees by setting up tournaments in which those at the top are paid disproportionate rewards, thereby inducing those at lower levels to compete for promotion and advancement. Such pay structures are viewed as economically efficient because a collective group of employees is being motivated via the pay of a few, rather than motivating on an individual basis (Connelly et al., 2014). As discussed previously, another notable strength of such systems is the ability to distribute risk when absolute measures of individual ability are difficult to obtain.

This stands in opposition to motivation-enhancing HPWSs, which often include provisions for pay-for-performance plans and above-market pay level as basic staples (Jiang, Lepak, Hu, & Baer, 2012). The idea behind pay-for-performance is that individuals are motivated to produce more if they are paid directly based on how much they

produce for the organization (Deckop, Mangel, & Cirka, 1999; Oliver & Anderson, 1995). The literature has generally found this link to hold in organizations (Jenkins, Mitra, Gupta, & Shaw, 1988; Rynes, Gerhart, & Parks, 2005); however, it creates greater expense for the firm. Rather than paying only a handful of organizational actors above their marginal contribution to the firm, the firm pays all employees in accordance with the firm's pay policy. While dispersed pay structures that are based on pay-for-performance tend to promote a sense of equity among employees and have been demonstrated to lead to better individual performance (Shaw et al., 2002), the use of both practices simultaneously will likely increase the firm's cost structure and diminish the effectiveness of VPD.

Similarly, though paying above-market wages or providing above-market benefits is likely to attract high-quality human capital, it is possible that this human capital would have been motivated to join the firm at (or possibly below) market wages at the entry level, with the promise of being able to compete for significantly higher rewards with advancement in the firm. As noted above, VPD focuses on the relative nature of compensation, rather than absolute compensation. Therefore, the emphasis tends to be placed on internal comparisons within the tournament rather than external market comparisons. This emphasis on competition stands at odds with information-sharing practices and participation mechanisms aimed at producing collaboration through the HPWS. Employees are essentially being pulled in two separate directions by the various elements of the control system, leading to suboptimal results.

Other elements of traditional models of motivation-enhancing HPWSs are likely to work against the vertical pay structure, as well. For instance, pay plans that are based on profit sharing, team-based pay, or gainsharing all operate on a basis of collaboration. These programs enhance employee wages to the extent that the team, department, or firm does well financially. Such programs can be useful under the right context in motivating human capital to achieve high levels of performance, particularly through shared efforts. However, if these programs are implemented in conjunction with vertical pay dispersion, the two attributes may work against each other. If some parties receive a larger share of the pie when profits or gains are shared, it may be perceived as unfair by those lower in the hierarchy. This may lead to a sense of inequity that undermines the intended collaboration of

the HPWS. Similarly, if rewards are shared with all individuals in the organization, it may contribute to a "free rider" effect, in which poor performers receive pay increases for efforts they have not given. This will likely be a disincentive to high performers, leading them to sort out of the organization.

Further, it may be more economically efficient to offer a vertically dispersed pay structure rather than both offering such a structure *and* paying above market wages or providing above-market benefits. By paying all employees significantly above the market rate, rather than paying only those who "win" the corporate tournament higher rates, the firm is increasing its overall cost structure. By combining high average wages with higher maximum wages, the firm places itself at a competitive disadvantage relative to peers emphasizing only one or the other. The results are a less efficient control system. This leads to the following:

> **Hypothesis 3:** *Motivation-enhancing HPWSs will negatively moderate the relationship between VPD and organizational performance, such that an increased emphasis on HPWSs dilutes the effectiveness of VPD on firm performance.*

Opportunity-enhancing practices are employee suggestion and participation systems, job rotation, job autonomy, and communication programs (Jiang, Lepak, Hu, & Baer, 2012). As compared to motivation-enhancing and skill-enhancing HPWSs, we expect that opportunity-enhancing HPWSs will actually make vertical pay structures more successful at improving firm performance. This is expected because HPWSs enhance the number of opportunities available to employees who are already incentivized to perform at a high level by the vertical pay structure. The net effect is an increase in performance because highly motivated workers are matched with opportunities.

A key tenet of tournament theory is that tournaments are successful at motivating performance only if contestants feel as if their investment of effort will directly influence their probability of advancing in the tournament (Connelly et al., 2014). Similar to the predictions of expectancy theory (Vroom, 1964), individuals will put forth optimal effort only if they believe that the increased effort will directly enhance their chance of "winning" the promotion. Therefore, we expect that opportunity-enhancing HPWSs, which include such practices as

job autonomy, communication, and participation (Jiang, Lepak, Hu, & Baer, 2012) will work in concert with VPD by providing individuals with greater opportunities to display their skill relative to others in the firm. Without the opportunity to participate, those involved in corporate tournaments may feel frustrated and will be less likely to put forth the effort necessary to "win," as they sense that winning is based on factors unrelated to job performance.

Further, opportunity-enhancing HPWSs tend to focus more upon unlocking intrinsic motivation rather than building extrinsic motivation (Jiang, Lepak, Hu, & Baer, 2012; Ryan & Deci, 2000). As such, these practices are likely to work via different motivational cues than VPD, which can be more fully linked to extrinsic motivation (Connelly et al., 2014; Twenge, Campbell, Hoffman, & Lance, 2010). Assuming a multi-faceted view of motivation (Reiss & Havercamp, 1998), which includes elements of both extrinsic and intrinsic motivation, providing opportunity enhancement with a VPD may result in an optimal solution for generating greater individual and organizational performance. This leads to the following prediction:

> **Hypothesis 4:** *Opportunity-enhancing HPWSs positively moderate the relationship between VPD and organizational performance such that an increased emphasis on HPWSs enhances the effectiveness of VPD on firm performance.*

In sum, we expect that HPWSs overall will undermine the effectiveness of vertical pay dispersion. We expect this to also hold in regard to skill-enhancing and motivation-enhancing practices, but expect that opportunity-enhancing practices will positively moderate the relationship. These relationships are summarized in Figure 1.

3   METHOD

3.1   Sample

To test the proposed hypotheses, we analyze a panel data set of firms in South Korea. Four waves of panel surveys were biennially collected during 2005, 2007, 2009, and 2011 by the Korea Research Institute for

Vocational Education and Training (KRIVET) in cooperation with the Ministry of Labor in South Korea. KRIVET created the initial sampling frame, which included all South Korean firms with more than 100 employees and for whom accounting performance data was available from the Korean Information Service. The initial sampling pool had 454, 467, 473, and 500 firms in 2005, 2007, 2009, and 2011, respectively. In each organization, both organizational-level surveys and employee-level surveys were administered. Human resources managers and strategic planning managers rated organizational-level survey items. For the employee-level survey, 13,101 employees in 2005, 11,473 employees in 2007, 10,019 employees in 2009, and 10,064 employees in 2011 were randomly selected at each wave from different hierarchical levels (e.g., rank-and-file employees, assistant managers, and executives) and diverse functional areas (e.g., marketing, finance, and management).[2]

We combined the employee-level data with organizational-level data because some variables in our study are measured by aggregating individual employees' responses. Additionally, as common method bias may influence the validity of findings (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), we merged the combined data set (organizational and individual data) with archival financial performance data available from the Korea Information Services.

While the four-waves of panel data contain a total of 832 firms after dropping observations with missing data, for the present study we used firms from which more than five top managers participated in the survey. We used five top managers as the criterion based on past research (Connelly, Haynes, Tihanyi, Gamache, & Devers, 2016). Our final sample is a panel of 233 firms and 8,328 employees. This is an unbalanced panel data set that consists of 60 firms and 2,427 employees (on average 40.5 employees in each firm) in 2005, 54 firms and 1,827 employees (on average 33.8 employees in each firm) in 2007, 58 firms and 1,913 employees (on average 33.0 employees in each firm) in 2009, and 61 firms and 2,161 employees (on average 35.4 employees in each firm) in 2011.

3.2 Measures

All the predictors are measured at four time points, 2004, 2006, 2008, and 2010.

3.2.1   Independent variable: Vertical pay dispersion

We followed Connelly et al. (2016)'s operationalization of VPD to measure vertical pay dispersion (VPD). Connelly et al. (2016) operationalized top management-to-worker pay dispersion as the average top management team (TMT) total compensation (numerator) divided by the average non-TMT employees' compensation (denominator). In this study, we broadly defined top management as department heads and executives. We obtained the average TMT total compensation for each firm by averaging department heads' and executives' total compensation for each firm (numerator). On average, our sample contains 7.61 top managers from each firm. To obtain average non-TMT employees' compensation (denominator), we first calculated the firm's total labor expenses from each firm's annual report; we summed the employees' salary (including TMT), incentives, and allowances. From the total labor expenses, we subtracted the total compensation for the TMT, which was calculated by multiplying the average TMT total compensation and the number of TMT. The total labor expenses excluding TMT were then divided by the number of employees (i.e., average non-TMT employees' compensation). We divided the average TMT total compensation (numerator) by the average non-TMT employees' compensation (denominator) and standardized it to measure a firm's VPD.

3.2.2   Moderation variable: HPWS

For the operationalization of HPWS index, we followed Shaw, Park, and Kim (2013) and measured selection ratio, training investment, pay level, benefit level, and communication. We measured the selection ratio by dividing the total number of new hires by the total number of applicants (Shaw, Delery, Jenkins, & Gupta, 1998). We measured training investment by dividing the total training expenses (for collective inside- and outside-the-company trainings) by the number of full-time employees (Sung & Choi, 2014). Following Shaw et al. (2013), we measured benefit level as the average annual benefit level for full-time employees. Pay level was similarly operationalized as the average annual salary level for full-time employees. To measure the communication system, we averaged the three items used in Shaw et al. (2013) ($\alpha = 0.76$ in 2005; $\alpha = 0.75$ in 2007; $\alpha = 0.80$ in 2009; $\alpha = 0.82$ in 2011). Example item includes "our company shares organization

information with all employees through managers or company-wide communication systems." Employees assessed the three items using a 5-point Likert-type scale. We aggregated the communication scores to the organizational level; r_{wg} were 0.91 in 2005, 0.92 in 2007, 0.91 in 2009, and 0.91 in 2011. $ICC(1)$ and $ICC(2)$ were, respectively, 0.15 and 0.87 in 2005, 0.17 and 0.87 in 2007, 0.19 and 0.88 in 2009, and 0.19 and 0.89 in 2011. Overall, aggregation of employee responses at the firm level is supported.

To measure motivation-enhancing and opportunity-enhancing HP-WSs more broadly, we included performance evaluation, pay for performance, employee suggestion, job rotation, job autonomy, and employee participation in decision making in our HPWS index. Human resource managers in each organization reported if the organization had completed employee evaluations; the balanced scorecard, competency evaluation, multisource evaluation, and performance feedback (1 = yes, 0 = no). We averaged these four evaluation practices to create the performance evaluation measure. Pay for performance was measured in the same way. We averaged four dummy variables (1 = yes, 0 = no), which indicates the presence or absence of the following four pay-for-performance practices: team-based incentives, department-based incentives, gain sharing, and stock options.

For employee suggestion programs, we used a dichotomous variable that indicates whether employee suggestion systems had been administered in the organization. This was rated by human resource managers in each organization (1 = yes; 0 = no). We used a dummy variable that indicates the presence or absence of a job rotation practice in each organization. This was also rated by human resource managers (1 = yes; 0 = no). We used aggregation of employees' ratings for job autonomy and participation in decision making. Employees in each organization assessed the extent to which employees in their work teams actively participated in decision making and problem solving using a 5-point Likert-type scale. We aggregated these individual responses to produce a participation in decision making measure at the organizational level. We examined the appropriateness of aggregation using such aggregation statistics as r_{wg} (James, Demaree, & Wolf, 1993) and intraclass correlation [$ICC(1)$ and $ICC(2)$]. r_{wg} were 0.83 in 2005, 0.84 in 2007, 0.83 in 2009, and 0.82 in 2011. $ICC(1)$ and $ICC(2)$ were, respectively, 0.02 and 0.14 in 2005, 0.11 and 0.50 in 2007,

0.21 and 0.68 in 2009, and 0.11 and 0.46 in 2011. These aggregation statistics indicate that there is a significant difference between organizations and high reliability among employees. Job autonomy was measured in the same way. Employees rated the extent to which they have job autonomy in doing their work using a 5-point Likert-type scale. We aggregated the job autonomy scores to the organizational level for our analysis. r_{wg} were 0.79 in 2005, 0.74 in 2007, 0.77 in 2009, and 0.80 in 2011. *ICC*(1) and *ICC*(2) were, respectively, 0.03 and 0.23 in 2005, 0.10 and 0.47 in 2007, 0.14 and 0.55 in 2009, and 0.18 and 0.60 in 2011. These *ICC* statistics justify the aggregation.

We utilized a formative measurement of the HPWS index based on the criteria outlined in MacKenzie, Podsakoff, and Jarvis (2005). We utilize this approach for three specific reasons. First, the sum of HR practices defines manifestations of the HPWS rather than being defined by it. Second, different HR practices represent a unique aspect of the HPWS, and thus are not interchangeable. This suggests HR practices do not systematically co-vary. Third, in spite of some commonalities, each HR practice may have different/unique antecedents and outcomes (Jiang, Lepak, Han, Hong, Kim, & Winkler, 2012). Meeting all the criteria, in this study, HR practices as indicators are viewed as combining to cause the latent construct, HPWS, rather than being caused by it (MacCallum & Browne, 1993). Therefore, the HPWS index is a formative measure. Reliability assessments such as coefficient alpha are not appropriate for a formative measure, as its indicators are not expected to co-vary (Bollen & Lennox, 1991; Diamantopoulos & Siguaw, 2006; MacKenzie et al., 2005).

Following previous studies (e.g., Shaw, Dineen, Fang, & Vellella, 2009; Wright et al., 2005), we standardized the 11 HR practices and created an additive index of HPWS. Additionally, we categorized the 11 HR practices into three dimensions of HPWS to create skill-enhancing, motivation-enhancing, and opportunity-enhancing HPWSs based on the work by Jiang, Lepak, Hu, and Baer (2012).

3.2.3 Dependent variable: Organizational performance

For the dependent variable, we used four financial performance measures, which are widely used in the strategic management literature (e.g., Hoskisson, 1987; Roberts & Dowling, 2002): return on assets (ROA), firm profitability, net income, and workforce productivity.

To establish better causal ordering of relationships, we included past organizational performance measured at *T* as a control variable. The past performance measures vary depending on the dependent variables used in the analysis model. For example, when ROA measured at *T* + 1 was used as a dependent variable, ROA at *T* was controlled.

We measured ROA by dividing after-tax profit (or net profit) by total assets (Roberts & Dowling, (2002). Following Mehra (1996), we measured firm profitability as net profit per employee. Because of the skewness of the distribution, firm profitability was logged. Shapiro-Wilk *W* statistic showed that the sampling distribution after the transformation approached normality ($W = .99$, ns) (Royston, 1982; Shapiro & Wilk, 1965). We adopted a one-year lag into our performance measures to examine how predictors in year *T* influenced organizational performance in *T* + 1.

In our robustness checks, we used an organization's net income and workforce productivity as dependent variables. Workforce productivity was measured as total sales per employee (Shaw et al., 2013). Workforce productivity was logged due to the skewed distribution. Shapiro-Wilk *W* statistic supported the transformation, indicating that the sampling distribution approached normality ($W = .98$, $p < .01$) (Royston, 1982; Shapiro & Wilk, 1965). Ratio measures as dependent variables may confound the estimated relationships with independent variables because independent variables may be associated with both the numerator and the denominator of the ratio measures (e.g., Barnett & Salomon, 2012). Therefore, we complemented the above dependent measures with an unscaled measure of organizational performance. Following Barnett and Salomon (2012), we used net income as a non-ratio measure of organizational performance. Because the measure was skewed, we used the natural log of net income. The transformation was supported by the Shapiro-Wilk *W* statistic ($W = .99$, ns) (Royston, 1982; Shapiro & Wilk, 1965).

3.2.4   *Control variables*

We included several control variables that are relevant to our research model. We controlled for organizational age (the number of years since the founding year) and size (log of the number of full time employees) as older and larger organizations are more likely to employ better developed HR practices than smaller organizations

(Guthrie, 2001). Organizational human capital is positively associated with both HPWSs and organizational performance (e.g., Jiang, Lepak, Hu, & Baer, 2012). Therefore, we controlled for the average employee educational level (Black & Lynch, 1996). We included a weighted average of organizational educational level (1 = less than high school diploma; 2 = two-year college degree; 3 = four-year college degree; 4 = master's degree; 5 = doctoral degree), in the analysis.

We controlled for a firm's strategic orientation in the industry because it may influence the implementation of HPWS as well as firm performance. The strategic planning manager in each organization rated the firm's strategic orientation, whether it behaves most like a prospector, analyzer, or defender in the industry in each year (Miles & Snow, 1978). A detailed definition for each term was provided in the survey. With defender as a reference group, we created two dummies (prospector and analyzer) and included them in the analysis.

Finally, we controlled for industry effects and year effects by including industry dummies and year dummies. Measurement invariance testing was also completed prior to analyzing the data as a prerequisite for correctly interpreting the results from a longitudinal sample (Finkel, 1995). We adapted the procedure suggested by Diamantopoulos and Papadopoulos (2010); we used year as a grouping variable. The invariance tests confirmed that the HPWS index is structural, slope, and residual invariant across the 2005, 2007, 2009, and 2011 panels. The results are not reported herein to conserve space but are available from the authors upon request.

3.3   Analytical strategy

The sampling frame includes organizations from which at least five TMT members participated in the survey. Although the necessity can be well justified, this may cause a sample selection problem because sample selection bias generally occurs when observations are not randomly selected (Greene, 2008; Heckman, 1979). To address the potential bias, we conducted a two-stage Heckman correction procedure (Heckman, 1979). In Stage 1, a probit model predicting the likelihood of being included in the final sample (i.e., more than five TMT members participated in the survey) was used with organizational age, organizational size, HPWS, trust, past performance, and industry and

year dummies as independent variables. Based on the result of the probit model, the inverse Mills ratio was calculated (Greene, 2008). This correction was included as a control variable in the second stage analysis (Heckman, 1979), but the inverse Mills ratio was not significant. The analysis results showed no evidence of sample selection bias. Therefore, following Berrone and Gomez-Mejia (2009), and Pathak, Hoskisson, and Johnson (2014), we excluded the inverse Mills ratio from the following analysis models to preserve degrees of freedom.

4 Results

Descriptive statistics of our study variables and their intercorrelations are presented in Table I. Tables 2 and 3 show the hierarchical regression analysis results.

Hypothesis 1 postulated that HPWSs negatively moderate the relationship between VPD and organizational performance. As Tables 2 and 3 show, the interaction between VPD and HPWS was negative and significant with respect to ROA (Model 4: $b = -2.43$, SE $= .95$, $p < .05$) and firm profitability (Model 10: $b = -.17$, SE $= .09$, $p < .10$). Following the suggestion by Aiken and West (1991), we plotted the interaction effect of HPWSs and VPD with one standard deviation above and below the means of variables. As Figure 2(a) and Figure 3(a) show, the effect of VPD on organizational performance is positive for low HPWS but negative for high HPWS. We further examined the simple slopes of each plot (Preacher, Curran, & Bauer, 2006). The simple slopes tests showed that the effect of VPD for high HPWS was significant for ROA ($b = -1.59$, SE $= .65$, $p < .05$) and firm profitability ($b = -.18$, SE $= .06$, $p < .01$). The effect of VPD for low HPWS was significant for ROA ($b = 3.27$, SE $= 1.33$, $p < .05$) but not for firm profitability ($b = .16$, SE $= 0.13$, ns). In general, Hypothesis 1 was supported.

Hypothesis 2 proposed that skill-enhancing HPWS negatively moderates the relationship between VPD and organizational performance. As shown in Tables 2 and 3, the interaction between VPD and skill-enhancing HPWSs was negative and significant with respect to ROA (Model 6: $b = -17.39$, SE $= 4.82$, $p < .01$) and firm profitability (Model 12: $b = -1.19$, SE $= .48$, $p < .05$). Following the same procedure, we plotted the interaction effect of VPD and skill-enhancing HPWS

on organizational performance in Figures 2 and 3. The plots consistently indicate that the effect of VPD on firm performance is negative for high-skill-enhancing HPWS but positive for low-skill-enhancing HPWS. Simple slopes tests results supported our interpretation. The effect of VPD for high-skill-enhancing HPWS was negative and significant for ROA (b = −13.69, SE = 4.23, p < .01) and firm profitability (b = −1.02, SE = .42, p < .05). The effect of VPD for low-skill- enhancing HPWSs, however, was positive and significant in predicting ROA (b = 21.09, SE = 5.47, p < .01) and firm profitability (b = 1.35, SE = .55, p < .05). Thus, Hypothesis 2 was supported.

Hypothesis 3 postulated that motivation-enhancing HPWS negatively moderates the relationship between VPD and organizational performance. Tables 2 and 3 indicate that the interaction between VPD and motivation-enhancing HPWS was negative and significant in predicting ROA (Model 6: b = −18.15, SE = 4.37, p < .01) and firm profitability (Model 12: b = −1.05, SE = .43, p < .05). The interactive effects of VPD and motivation-enhancing HPWS are presented in Figures 2 and 3. Consistent with our expectation, the plots show that the effect of VPD on firm performance depends on the level of motivation-enhancing HPWS. Simple slopes tests show that the effect of VPD for high-motivation-enhancing HPWS was negative and significant with regard to ROA (b = −14.45, SE = 3.68, p < .01) and firm profitability (b = −.89, SE = .36, p < .05). Simple slopes tests also show that the effect of VPD for low-motivation-enhancing HPWSs was positive and significant with regard to ROA (b = 21.85, SE = 5.10, p < .01) and firm profitability (b = 1.22, SE = .50, p < .05). Hypothesis 3 was supported.

Hypothesis 4 proposed that opportunity-enhancing HPWSs positively moderate the relationship between VPD and organizational performance. As shown in Tables 2 and 3, the interaction between VPD and opportunity-enhancing HPWSs was positively significant in predicting ROA (Model 6: b = 15.86, SE = 4.37, p < .01) and firm profitability (Model 12: b = .94, SE = .43, p < .05). Consistent with our expectation, the interactive effects of VPD and opportunity-enhancing HPWSs presented in Figures 2 and 3 indicate that the effect of VPD on firm performance is positive for high-opportunity-enhancing HPWSs but negative for low-opportunity-enhancing HPWSs. We further performed simple slopes tests. The effect of VPD for high-opportunity-enhancing HPWS was positive and significant with respect to ROA (b

= 19.56, SE = 5.05, $p < .01$) and firm profitability ($b = 1.10$, SE = 0.50, $p < .05$). However, the effect of VPD for low-opportunity-enhancing HPWS was negative and significant in predicting ROA ($b = -12.16$, SE = 3.76, $p < .01$) and firm profitability ($b = -.78$, SE = .37, $p < .05$). Thus, Hypothesis 4 was supported. We obtained similar results with work-force productivity and net income as criterion variables.

4.1 Robustness checks

4.1.1 Quality of management

While the analysis results provided consistent support for our hypotheses across various performance measures, they cannot completely rule out alternative explanations. Quality of management could be a critical alternative explanation for the relationships. High-quality management influences the designs of both HPWSs and VPD as well as firm performance. This raises an endogeneity concern for our findings. While controlling for past performance, which captures the nature of management quality, reduced some concern, we reran the analysis models with the measure of management quality controlled. Quality of management was measured by using the following four items ($\alpha = .73$ in 2005; $\alpha = .71$ in 2007; $\alpha = .74$ in 2009; $\alpha = .74$ in 2011), which were rated by individual employees in each firm using a 5-point Likert-type scale: the extent to which the firm retains talented employees, values talented employees, informs employees of firm's situation in detail, and is being run by effective leadership. We aggregated the individual-level measure to obtain the organizational-level management quality ($ICC(1) = 0.19$, $ICC(2) = 0.90$ in 2005; $ICC(1) = 0.18$, $ICC(2) = 0.88$ in 2007; $ICC(1) = 0.19$, $ICC(2) = 0.89$ in 2009; $ICC(1) = 0.20$, $ICC(2) = 0.90$ in 2011).

The analysis results with management quality controlled also supported our hypotheses. The interaction between VPD and HPWSs was significantly associated with ROA ($b = -2.34$, SE = .96, $p < .05$). The interactions of VPD with skill-enhancing HPWSs ($b = -17.27$, SE = 4.82, $p < .01$), with motivation-enhancing HPWS ($b = -18.07$, SE = 4.38, $p < .01$), and with opportunity-enhancing HPWS ($b = 15.84$, SE = 4.38, $p < .01$) also significantly predicted ROA. Consistent results were found for firm profitability.

4.1.2 Incentive effect of VPD

Essential to our theoretical argument is that VPD plays a role to incentivize employees. However, the differences in human capital among employees, specifically between workers and the management team, can increase VPD, and the proportion of VPD based on this legitimate reason may be less relevant to the incentive role. Thus, we reran the analysis models controlling for the variance of human capital within firm; the higher the variance of human capital, the higher VPD is. As educational level is one of the most widely used proxies for human capital, we used individual employees' educational level to calculate the variance of employees' educational level for each firm. The educational level of all the employees was provided by human resources managers in each firm. Controlling for the variance of human capital allowed us to more clearly examine the incentive effect of VPD.

The results supported our hypotheses, as well. VPD–HPWS interaction significantly predicted ROA ($b = -2.42$, SE = 0.95, $p < 0.05$). Similarly, the interactions of VPD with skill-enhancing HPWSs ($b = -17.24$, SE = 4.84, $p < .01$), with motivation-enhancing HPWSs ($b = -18.09$, SE = 4.38, $p < .01$), and with opportunity-enhancing HPWS ($b = 15.78$, SE = 4.38, $p < .01$) were significantly associated with ROA. Consistent results were obtained with firm profitability.

5   Discussion

VPD and HPWSs offer competing logics for increasing performance through human resources. Results suggest that skill-enhancing and motivation-enhancing HPWS work to attenuate the efficacy of VPD, while opportunity-enhancing HPWSs strengthen the relationship between VPD and various firm performance metrics. As such, the study offers a number of useful insights for scholars and practitioners. First, the implications of tournament theory and vertical pay dispersion have been discussed at length in the economics and strategy literatures, but have seldom been examined in concert with other management practices. Given that systems are often at work simultaneously, organizations seeking to optimize the efforts of their employees ought to carefully consider the implications of using both vertical pay structures and HPWSs to manage employees.

As opposed to a universalistic view of HPWS as nearly always being beneficial to organizational success (Pfeffer, 1998), the present study supports a configurational approach (Lepak & Snell, 1999, 2002) in which practices need to be considered as they relate to one another prior to implementation. If practices compete with one another in terms of their motivational properties, then they might not be usefully configured within the same system. This study highlights the fact that the link between vertical pay structures and performance is significantly weaker when skill- and motivation-enhancing high-performance work practices are leveraged. This is not necessarily because these practices always compete, but may simply reflect the reality that employee skill and ability may be maximized by less expensive channels than those generally thought to accompany an HPWS. Offering disproportionately increasing monetary rewards may provide enough incentive to attract and retain high-quality workers, without the need to invest in additional practices. Additional analysis is necessary to continue to assess this possibility.

Second, this article offers a nuanced perspective of the relationship between HPWSs and VPD by decomposing the HPWS into skill-, motivation-, and opportunity-enhancing elements. This was demonstrated to be an important test as the three subbundles were found to relate differently to VPD. While skill- and motivation-enhancing HPWSs diminished the effectiveness of VPD in firm performance, the opportunity-enhancing HPWS seems to increase the effectiveness of VPD. This was hypothesized and relates to the nature of opportunity-enhancing HPWS. Those employees who choose to join organizations with steep hierarchies are hungry for the opportunity to prove their worth, particularly in relationship to others competing for similar promotions. As such, providing employees with participation mechanisms and other opportunity-enhancing practices fits well with the aims of the vertically deployed pay structure. High-potential employees join the firm in the hope of gaining high levels of rewards and further benefit from having the opportunity to perform. Under such situations, firms are more likely to optimize the use of human capital.

Third, this article is able to leverage a multiyear data source to test the relationships longitudinally. While causation is not inferred, this model helps to limit reverse causality and allows for the chronological spacing of the independent and dependent variables. This represents

an important contribution to the strategic HRM literature, which has more frequently relied on cross-sectional designs rather than panel-data models.

Taking the findings of the study together offers a number of useful avenues for continued investigation. First, one potential avenue for integrating VPD and HPWSs is via workforce differentiation. As advocated by Huselid and Becker (2010), workforce differentiation suggests that organizations may be served well to offer different models of workforce management to different groups of employees within the firm. Those that are more strategically important assets ought to be managed differently than those with less strategic significance to the firm. Lepak, Taylor, Tekleab, Marrone, and Cohen (2007) found support for this idea in demonstrating that firms tend to utilize high-involvement HR systems to a greater extent for "core" employees. Building on these ideas, it would be worthwhile to investigate the utilization of HPWs at higher levels of the organization and leveraging VPD for lower-level positions. Of course, this introduces a number of integration challenges, but provides an interesting avenue for future investigation.

Future work may also examine the connections of VPD and HPWSs given different levels of task interdependency, a known moderator of the relationship between horizontal pay dispersion and performance outcomes (Shaw et al., 2002). It may be that VPD is particularly powerful in highly autonomous work, which marginalizes the effectiveness of HPWSs. However, under situations of greater task interdependence, it may be that VPD and HPWSs work more closely together or via similar channels. Future research ought to assess the joint effects of HPWSs and VPD in task-interdependent environments to determine the nature of the relationship between the two constructs when teamwork is necessitated.

Though tangential, this study further adds to the literature examining the effects of compensation on performance outcomes. The results of this study highlight the important motivational role that VPD plays in producing performance outcomes. This supports the traditional sorting and incentive effects espoused by tournament theory (Lazear & Rosen, 1981). However, this study does not examine other unintended consequences of such practices like competition within the firm, a lack of teamwork, or higher levels of turnover (Akerlof &

Yellen, 1988; Ferraro et al., 2005; Pfeffer & Langton, 1993). Future work is necessary to determine if more egalitarian pay structures fit more closely with HPWSs.

5.1 Practical Implications

The theoretical and empirical relationships discussed above have important practical implications for HR professionals. Most notably, the paper continues to highlight the importance of viewing HR practices from a systems approach. Understanding the ways in which compensation practices interface with the rest of the HR system is an important key to building effective systems. The study demonstrates the importance of not working against purposes with the system itself to ensure that the HR practices in place complement one another rather than detract from one another. HR professionals are well served to focus on intended outcomes and then devise a constellation of practices to achieve the desired outcomes. This stands in contrast to a best practices model that assumes "more is better." Considering the horizontal linkages is key to both minimizing costs and ensuring a return from investments in the HR architecture.

In particular, firms appear to be well positioned when they pair compensation practices that enhance motivation and sort high-quality candidates into the firm with opportunity-enhancing practices that allow those individuals to showcase their talents. The firm may be able to limit costs in other areas by offering competitive wage structures, but should be mindful of maximizing opportunity enhancement within the firm. At the same time firms that leverage high levels of HPWS in seeking collaboration and commitment from employees will likely be served by more egalitarian pay structures and flatter organizational structures.

The key takeaway message for practitioners is to understand the desired outcomes of the HR system and tailor the system toward those outcomes. A consultancy that relies significantly on the efforts of individual employees may receive optimal results from a hierarchical pay structure that minimizes other HR systems. Such a firm will likely be able to sort in high-quality applicants with less cost, incentivize performance through promotion and pay increases, and sort out poor performers who do not advance in the corporate tournaments,

without having to invest in costly training, development, and performance improvement practices. Such is the case in many consulting, accounting, and law firms that rely on "up or out" partnership-based business models.

Conversely, a firm that seeks to build a pool of committed human resources that work collaboratively will likely be served best by offering a less hierarchical pay structure that emphasizes training and career development alongside participation, information sharing, and more group or team-based pay practices, to ensure the firm's human capital remains knowledgeable and motivated to produce. Companies such as Whole Foods (Harasta & Hoffman, 2013), which deemphasize power distance and strive for fewer levels of hierarchy, are likely better served by a full HPWS, rather than a reliance on a hierarchical pay structure.

The results may also have implications for smaller firms. While such companies are likely to lack the resources to invest heavily in a full system of HR practices, they may be able to achieve similar benefits from a vertically dispersed pay structure. Such structures may be built on incentives or other forms of "at risk" compensation, as to minimize the risk held by the organization. If such systems are able to sort and incentivize quality human capital, the results may be more economically efficient for smaller firms. Of course, additional analysis is necessary prior to implementing such practices.

5.2   Limitations

The results of the study should be considered in light of its limitations. First, the study utilizes a large archival data source, which limits the ability to understand the microdynamics of the motivational elements of both VPD and HPWS. Such factors are inferred from existing theory, but are not measured directly. Similar to motivation, attitudinal variables such as organizational commitment (Meyer & Allen, 1991) and perceived organizational support (Eisenberger, Huntington, Hutchison, & Sowa, 1986) may also be influenced by VPD and HPWS. Though this is a common limitation in the field of strategic human resource management, future research should directly examine how a simultaneous utilization of VPD and HPWS influences employees' work motivation and work attitudes, which, in turn, contribute to firm

performance. Further, many of the reported measures are subjectively assessed, particularly the measures for HPWS. Many firms experience significant differences in perceptions of the practices they claim and those they actually implement (Liao, Toya, Lepak, & Hong, 2009). It was not possible for us to measure the actual versus the intended use of such practices, which limits the conclusions that can be drawn from the study. Further related to the measurement of total employment value under efficiency wage theory, based on the broader HPWS literature, we use payroll as a proxy for efficiency wage. Efficiency wage requires separation of total employment value from total compensation. While in the strategic HRM literature it is common to use employees' annual salary as a proxy for efficiency wage, such measurements remain a limitation of this study.

We acknowledge that the generalizability of the findings may be limited to South Korea, a culture that is considerably different from the United States. While the United States is an individualistic culture, South Korea is a collectivistic culture. In an individualistic culture, personal interests are of the most importance, but in a collectivistic culture, the cooperation among individuals is emphasized, and group interests take precedence over individual interests or needs (Wagner, 1995). This unique context may enlarge the detrimental effect of VPD when it is utilized with HPWSs because VPD encourages competition among employees. Future research could endeavor to address the generalizability of our findings. In addition, while several control variables were included in the regressions, including controls for past performance, there still could be the possibility of omitted variable bias. When a variable that influences both predictors and the dependent variable is excluded from an analysis model, omitted variable bias occurs (Greene, 2008). We could not capture varying firm and employee characteristics; however, estimates in a panel setting account for unobserved firm heterogeneity, and thus allows for more consistent and reliable estimation.

5.3   Conclusion

While vertical pay dispersion and high-performance work systems each offer motivational benefits to organizations, the underlying mechanisms between such systems operate differently. As such,

careful attention needs to be given to creating harmony between the compensation practices of the firm and the constellation of other HRM practices leveraged. The results from this study suggest that including VPD and HPWSs simultaneously may lead to suboptimal outcomes, particularly in regard to skill- and motivation-enhancing HPWSs. At the same time, creating opportunities via the firm's HR system appears to complement the principles of VPD to enhance performance.

Contrasting VPD and HPWS			
	Vertical pay dispersion	HPWS	*Combined Effect*
			Enhance-detract-substitute
Operating logic	Competition	Collaboration	Detract
Skill enhancement	Sorting in through signaling Incentivize promotion, sort out poor performers	Extensive Recruiting Selective Staffing Training Career Development	Substitute
Motivation enhancement	Individual-based, escalating rewards Focus on relative performance	High pay and benefit level Pay for performance Profit-sharing Gainsharing ESOP	Detract/Substitute
Opportunity enhancement	Not directly addressed	Employee suggestion Job rotation Job autonomy Communication Employee participation in decision-making	Enhance

Figure 1. Contrasting VPD and HPWS

(a) Moderating effect of HPWS for relationship between VPD and *ROA*

(b) Moderating effect of skill-enhancing HPWS for relationship between VPD and *ROA*

(c) Moderating effect of motivation-enhancing HPWS for relationship between VPD and *ROA*

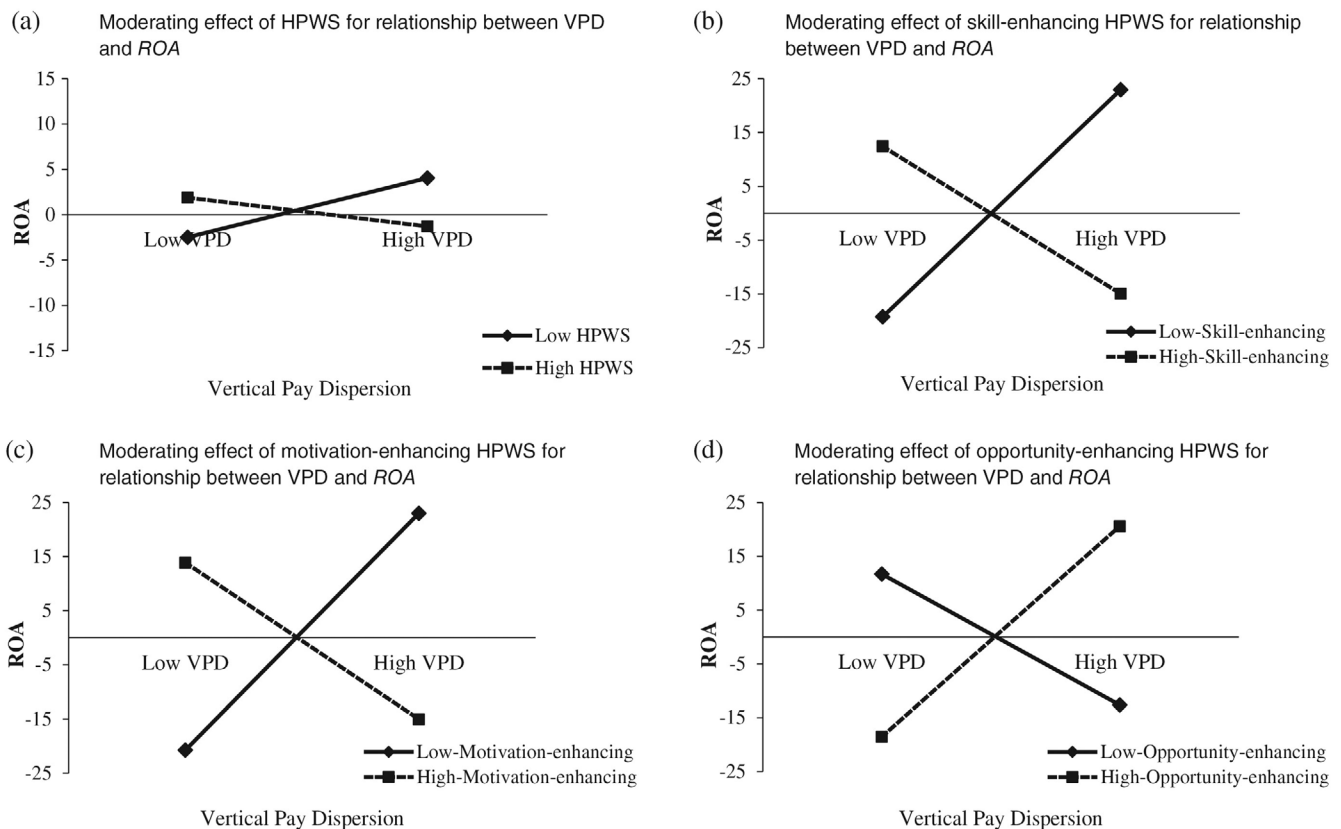(d) Moderating effect of opportunity-enhancing HPWS for relationship between VPD and *ROA*

Figure 2. Interactive effect of vertical pay dispersion (VPD) and high-performance work systems (HPWSs) on ROA

(a) Moderating effect of HPWS for relationship between VPD and *firm profitability*

(b) Moderating effect of skill-enhancing HPWS for relationship between VPD and *firm profitability*

(c) Moderating effect of motivation-enhancing HPWS for relationship between VPD and *firm profitability*

(d) Moderating effect of opportunity-enhancing HPWS for relationship between VPD and *firm profitability*
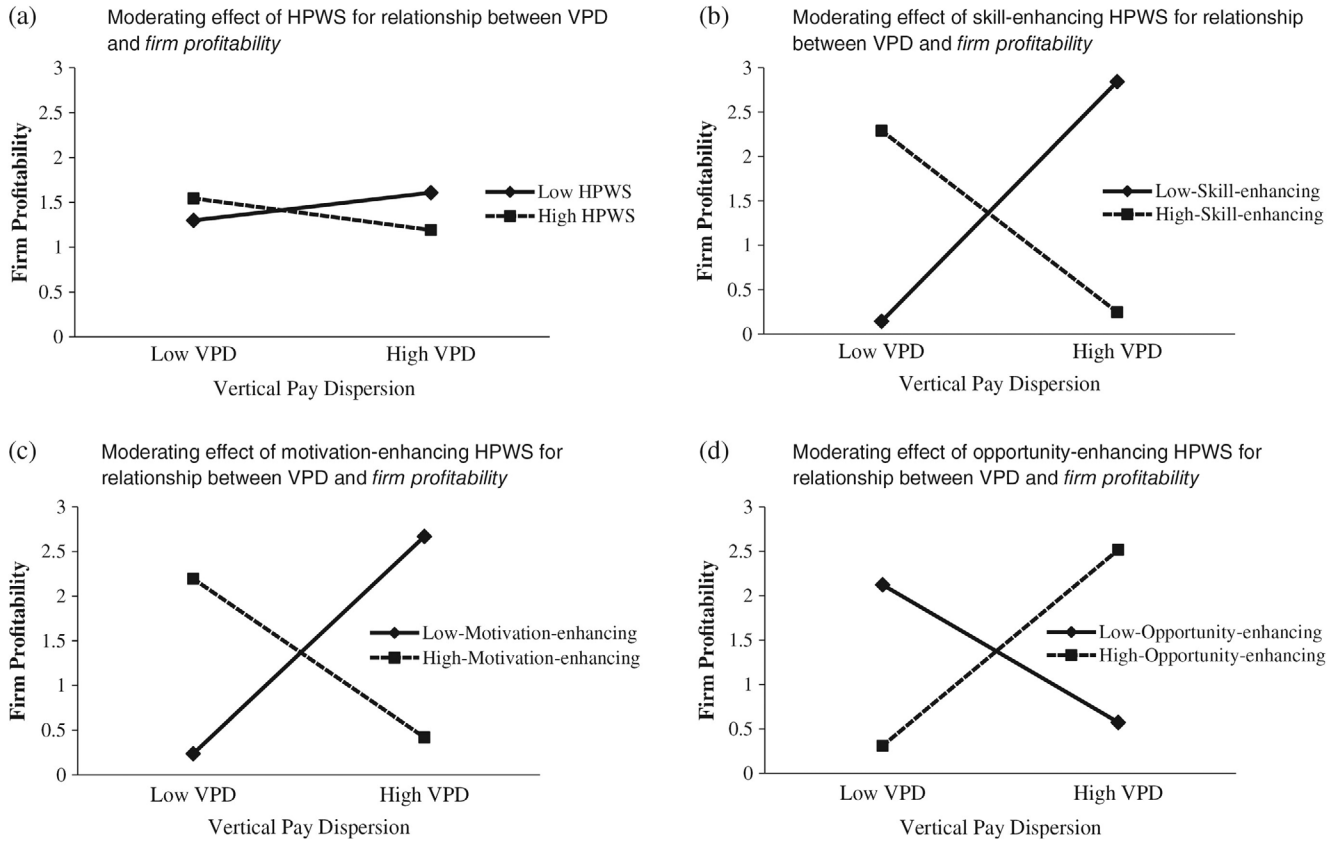

Figure 3. Interactive effect of vertical pay dispersion (VPD) and high-performance work systems (HPWS) on firm profitability

Table 1. Descriptive statistics and correlations

Variable	M	SD	1	2	3	4	5	6	7	8
1. Organizational age	29.79	19.00	—							
2. Organizational size	2.90	0.51	0.21**	—						
3. Educational level of firm employees	2.26	0.56	–0.13*	–0.12	—					
4. Analyzer	0.36	0.48	0.01	–0.12	0.01	—				
5. Prospector	0.40	0.49	0.11	0.25**	0.04	–0.61**	—			
6. Vertical pay dispersion	0.00	1.00	–0.01	–0.01	0.02	–0.05	–0.06	—		
7. HPWS	0.00	1.00	0.05	0.42**	0.04	–0.14*	0.26**	0.02	—	
8. Return on assets	7.36	4.87	–0.14*	0.08	0.03	–0.13	0.05	–0.06	–0.02	—
9. Firm profitability	4.35	0.59	0.19**	0.22**	–0.15*	–0.06	0.13*	–0.16*	0.26**	0.45**

N = 233. HPWS = high-performance work system; SD = standard deviation.

* *p* < .05 ; ** *p* < .01

Table 2. Hierarchical regression results: interactive effect of vertical pay dispersion and HPWS on ROA

Predictors		Dependent Variable: ROA (T + 1)					
		Model 1 b.(SE)	Model 2 b.(SE)	Model 3 b.(SE)	Model 4 b.(SE)	Model 5 b.(SE)	Model 6 b.(SE)
Intercept		0.46 (3.86)	0.46 (3.87)	0.55 (3.88)	0.54 (3.83)	0.02 (3.88)	0.28 (3.71)
Control variables							
Organizational age		−0.03 (0.02)	−0.03 (0.02)	−0.03 (0.02)	−0.03 (0.02)	−0.03 (0.02)	−0.03 (0.02)
Organizational size		0.45 (0.64)	0.46 (0.64)	0.59 (0.71)	0.47 (0.70)	0.28 (0.74)	0.21 (0.70)
Educational level of firm employees		−0.94 (0.83)	−0.95 (0.84)	−0.92 (0.84)	−0.98 (0.83)	−1.06 (0.84)	−0.90 (0.81)
Analyzer		−0.20 (0.71)	−0.22 (0.72)	−0.22 (0.72)	−0.28 (0.71)	−0.16 (0.72)	0.18 (0.69)
Prospector		0.41 (0.74)	0.39 (0.75)	0.40 (0.75)	0.47 (0.74)	0.32 (0.75)	0.66 (0.73)
Past firm performance[a]		0.55 (0.05)**	0.55 (0.05)**	0.55 (0.05)**	0.55 (0.05)**	0.56 (0.06)**	0.55 (0.05)**
Independent variables							
Vertical pay dispersion (VPD)				−0.06 (0.26)	−0.06 (0.26)	0.84 (0.44)†	−0.05 (0.26)	3.70 (0.82)**
HPWS					−0.15 (0.33)	−0.24 (0.33)	
VPD × HPWS	[H1]				−2.43 (0.95)*		
Skill-enhancing HPWS							−0.31 (0.29)	−1.55 (0.46)**
Motivation-enhancing HPWS						0.34 (0.33)	−0.86 (0.44)†
Opportunity-enhancing HPWS						−0.36 (0.31)	0.75 (0.42)†
VPD × Skill-enhancing HPWS	[H2]						−17.39 (4.82)**
VPD × Motivation-enhancing HPWS	[H3]						−18.15 (4.37)**
VPD × Opportunity-enhancing HPWS	[H4]						15.86 (4.37)**
Industry and year dummies		Yes	Yes	Yes	Yes	Yes	Yes
F value 5.56**		5.39**	5.24**	5.41**	5.09**	5.77**	
R^2 / Adjusted R^2		0.52 / 0.43	0.52 / 0.42	0.52 / 0.42	0.54 / 0.44	0.53 / 0.43	0.58 / 0.48

N = 233
HPWS = high-performance work system
† $p < .10$; * $p < .05$; **$p < .01$
a. ROA measured at *T* was included.

Table 3. Hierarchical regression results: Interactive effect of vertical pay dispersion and HPWS on firm profitability

Predictors		Dependent Variable: Firm profitability (T + 1)					
		Model 7 b.(SE)	Model 8 b.(SE)	Model 9 b.(SE)	Model 10 b.(SE)	Model 11 b.(SE)	Model 12 b.(SE)
Intercept		1.45 (0.47)**	1.49 (0.46)**	1.47 (0.46)**	1.41 (0.46)**	1.44 (0.47)**	1.38 (0.46)**
Control variables							
Organizational age		−0.00 (0.00)	−0.00 (0.00)	−0.00 (0.00)	−0.00 (0.00)	−0.00 (0.00)	−0.00 (0.00)
Organizational size		−0.01 (0.06)	−0.01 (0.06)	0.02 (0.07)	0.01 (0.07)	0.01 (0.07)	0.00 (0.07)
Educational level of firm employees		0.07 (0.08)	0.06 (0.08)	0.06 (0.08)	0.06 (0.08)	0.06 (0.08)	0.06 (0.08)
Analyzer		0.00 (0.07)	−0.02 (0.07)	−0.02 (0.07)	−0.03 (0.07)	−0.02 (0.07)	−0.00 (0.07)
Prospector		0.07 (0.07)	0.04 (0.07)	0.05 (0.07)	0.05 (0.07)	0.05 (0.07)	0.06 (0.07)
Past firm performance[a]		0.69 (0.06)**	0.68 (0.05)**	0.69 (0.06)**	0.70 (0.06)**	0.69 (0.06)**	0.71 (0.06)**
Independent variables							
Vertical pay dispersion (VPD)			−0.07 (0.03)**	−0.07 (0.02)**	−0.01 (0.04)	−0.07 (0.03)**	0.16 (0.08)*
HPWS				−0.04 (0.03)	−0.04 (0.03)		
VPD × HPWS	[H1]				−0.17 (0.09)†		
Skill-enhancing HPWS						−0.03 (0.03)	−0.11 (0.05)*
Motivation-enhancing HPWS						−0.01 (0.03)	−0.07 (0.04)†
Opportunity-enhancing HPWS						−0.03 (0.03)	0.03 (0.04)
VPD × Skill-enhancing HPWS	[H2]						−1.19 (0.48)*
VPD × Motivation-enhancing HPWS	[H3]						−1.05 (0.43)*
VPD × Opportunity-enhancing HPWS	[H4]						0.94 (0.43)*
Industry and year dummies		Yes	Yes	Yes	Yes	Yes	Yes
F value		11.49**	11.83**	11.58**	11.51**	10.96**	10.80**
R² / Adjusted *R²*		0.69 / 0.63	0.71 / 0.65	0.71 / 0.65	0.71 / 0.65	0.71 / 0.64	0.72 / 0.66

N = 233
HPWS = high-performance work system
† *p* < .10 ; * *p* < .05 ; ** *p* < .01
a. Firm profitability measured at *T* was included.

Notes

1. We would like to thank the observations of an anonymous reviewer for bringing this attribute to our attention.
2. More details on sampling frame and survey procedures are available at http://eng.krivet.re.kr/eu/eh/prg_euGBADs.jsp

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Jake G. Messersmith is an associate professor of management at the University of Nebraska–Lincoln. His research focuses on the effects of HR systems on firm, unit, and individual performance.

Kyoung Yong Kim is an assistant professor of management at City University of Hong Kong. His research interests include high-performance work practices, employee–employer relationships, and leadership.

Pankaj C. Patel is an associate professor of management at Villanova University. His research interests are in the areas of innovation and governance.