

## RESOURCE ORCHESTRATION IN PRACTICE: CEO EMPHASIS ON SHRM, COMMITMENT-BASED HR SYSTEMS, AND FIRM PERFORMANCE

CLINT CHADWICK,<sup>1\*</sup> JANICE F. SUPER,<sup>3</sup> and KIWOOK KWON<sup>2</sup>

<sup>1</sup> School of Business, Management Department, University of Kansas, Lawrence, Kansas, U.S.A.

<sup>2</sup> Human Resources and Organizational Behavior Department, College of Business Administration, Konkuk University, Seoul, Korea

<sup>3</sup> Arthur J. Bauernfeind College of Business, Murray State University, Murray, KY, U.S.A.

*In order to be effective, managers at all levels of the firm must engage in resource management activities, and these efforts are synchronized and orchestrated by top management. Using a specific type of strategic resource, commitment-based human resource systems, we examine the effect of CEO resource orchestration in a multi-industry sample of 190 Korean firms. Our results demonstrate that CEO emphasis on strategic HRM is a significant antecedent to commitment-based HR systems. Furthermore, our results also suggest that CEO emphasis on strategic HRM has its primary effects on firm performance through commitment-based HR systems. This finding underscores the importance of middle managers in operationalizing top management's strategic emphasis, lending empirical support to a fundamental tenet of resource orchestration arguments.*

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### INTRODUCTION

Over the last 20 years, resource-based theory (RBT) has been used extensively to explain differences in firm performance. The essential tenet of RBT is that a firm can achieve and sustain a competitive advantage through its resources and capabilities (Barney, 1991). An impressive body of research has grown to substantiate this claim (Crook *et al.*, 2008). However, as critics of RBT note, strategically valuable resources and capabilities do not appear by magic. Rather, managers must often take

an active part in their development (Helfat, 2007; Mahoney, 1995; Sirmon *et al.*, 2007). Accordingly, scholars have recently proposed a theoretical extension of RBT that explicitly acknowledges the importance of managerial action: resource orchestration. Resource orchestration suggests that it is the combination of resources, capabilities, and managerial acumen that ultimately results in superior firm performance (Helfat, 2007; Sirmon *et al.*, 2007, 2011). This theory suggests three areas in which strategic resources can be developed to achieve a competitive advantage: breadth (scope of the firm), depth (throughout different levels within the firm), and life cycle (Sirmon *et al.*, 2011). Our focus in this paper is on resource orchestration through the depths of the firm.

Extant strategy research has generally focused on management roles at a single level, usually at the top of the firm (Castanias and Helfat, 1991;

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\*Correspondence to: Clint Chadwick, 326 Summerfield Hall, 1300 Sunnyside Ave., Lawrence, KS 66045-7601, U.S.A.  
E-mail: clint.chadwick@ku.edu

Holcomb *et al.*, 2009; Sirmon *et al.*, 2008). Little empirical research has examined how managerial action can reverberate down through the depths of the firm and affect the development of strategic resources (Sirmon *et al.*, 2011). In order to be effective, the resource management activities of managers at all levels of the firm must be carefully prioritized, synchronized, and supported—i.e., orchestrated—by top management, particularly by the firm's chief executive officer (CEO). Thus, we expect that CEOs' strategic emphasis will be an important antecedent to firms' strategic resources and capabilities. This is an intuitively appealing notion to strategy scholars, who have traditionally given much weight to top managers' strategic emphasis. Yet in order for top managers' resource orchestration efforts to influence firm performance, they must be operationalized by lower-level managers. Without the corresponding resources and capabilities, CEOs' strategic emphasis is just that—an emphasis—and is unlikely to have much meaningful impact on firm performance. It is here, at the interplay between CEOs' strategic emphasis and their firms' operationalizations of strategic resources and capabilities, that our paper makes its contribution to the resource orchestration perspective.

To lend specificity to our investigation, we locate this study in a stream of research that has a large body of empirical support; namely, research linking human resource management (HRM) systems and firm performance. Utilizing a multi-industry sample of 190 Korean firms from 2006, this paper's structural equation modeling demonstrates that CEOs' emphasis on strategic HRM (SHRM) is positively related to firms' use of commitment-based HR systems. Moreover, commitment-based HR systems significantly mediate the relationships between CEOs' emphasis on SHRM and three firm-level measures of performance: employee productivity, return on equity (ROE), and perceived performance. Because our evidence suggests that top managers' strategic emphasis is key to the successful operationalization of a strategic resource that requires middle management involvement, we provide empirical support for the resource orchestration perspective in the area of organizational depth (Sirmon *et al.*, 2011). In the next section of the paper, we elaborate on our theoretic logic within the resource orchestration literature.

## RESOURCE ORCHESTRATION THROUGH THE DEPTHS OF THE FIRM: THE CASE OF COMMITMENT-BASED HR SYSTEMS

Resource orchestration addresses an underdeveloped aspect of RBT: the manager's role in effectively developing and leveraging resources. Helfat and colleagues (2007) described asset orchestration as the “capacity of managers to create purposefully, extend, or modify the resource base of an organization” (24) which “involves assembling and ‘orchestrating’ configurations of co-specialized assets” (26). Similarly, in their 2007 article, Sirmon *et al.* suggested that management's role as it relates to RBT comprises three distinct dimensions: structuring, bundling, and leveraging. Structuring refers to the acquisition, accumulation, and divestiture of assets (Sirmon *et al.*, 2007). Once acquired, resources must be bundled—or specifically tailored—to meet the firm's unique needs. When resources have been successfully structured and bundled, they must be effectively leveraged (mobilized, coordinated, and deployed) to exploit market opportunities and to create value for customers (Sirmon *et al.*, 2011).

Hence, resource orchestration, an integration of asset orchestration and resource management arguments, encompasses managerial action related to the development and realization of strategic resources throughout the firm (Helfat, 2007; Sirmon *et al.*, 2007, 2011). While prior theoretical frameworks have considered the relationship between managerial attributes and firm performance, these frameworks have largely focused on a single level of the firm, most often top management (Castanias and Helfat, 1991, 2001; Holcomb *et al.*, 2009). In contrast, resource orchestration scholars explicitly recognize that multiple levels of management, with different perspectives and pressures, must cooperate and contribute to the realization of firms' goals and the achievement of competitive advantage (Sirmon *et al.*, 2011). In other words, in order for a firm to take full advantage of the strategic resources at its disposal, managers at all levels of the firm must work in concert with each other.

Nevertheless, top management is often a significant impetus for firms' strategic actions. Historically, strategic research has focused on top management (Castanias and Helfat, 1991, 2001; Hambrick and Mason, 1984). Top management,

especially the CEO, can have a weighty impact on all levels of the firm. It is the CEO's decisions that can most profoundly influence the firm's structure, determine how the firm will react to competitive pressures, decide how the firm's employees will be managed and treated, and so forth (Calori *et al.*, 1994). Moreover, structuring, bundling, and leveraging resources require that CEOs provide a persuasive vision for their firm's use of those assets (Helfat, 2007) that orients employees toward achieving their firms' goals and objectives. Hence, a CEO's influence cascades down the hierarchy of the firm, affecting employees from the top management team on down. For instance, top management commitment has been tied to successful implementation of MBO programs and the integration of corporate ethics programs, both of which require the support of line managers and employees (Rodgers *et al.*, 1993; Weaver *et al.*, 1999).

As we describe in more detail below, these general arguments map nicely onto the context that we examine in this paper, commitment-based HRM in Korea. HRM scholars propose that commitment-based HR systems can be strategically valuable resources for firms by increasing the knowledge, skills, and abilities of employees, by increasing their motivation, and by organizing work to give employees the best opportunity to help further the accomplishment of their firms' goals (e.g., Huselid, 1995). For instance, in commitment-based HR systems, intensive recruitment and staffing practices increase ability by bringing talented people into the firm, and training programs further develop employee knowledge and skills. Employee motivation can be heightened in these HR systems by performance-based compensation, performance appraisal techniques, flexible work schedules, grievance procedures, and internal promotion policies (Huselid, 1995; Youndt *et al.*, 1996). Additionally, jobs are designed in these systems so that employees have the latitude to act to further the accomplishment of their firms' goals (Huselid, 1995). Moreover, commitment-based HR systems can enhance firm performance by influencing the firm's internal social structures. For example, commitment-based HR systems foster teamwork and allow for flexibility, encouraging employees to cooperate and share information (Collins and Smith, 2006). In sum, because employees can be more capable, motivated, and engaged in commitment-based HR systems, productivity can increase, turnover can

decrease, and firms can be more likely to reach their strategic goals (e.g., Combs *et al.*, 2006).

Additionally, both strategy and HRM scholars have argued that systems or "bundles" of commitment-based HR practices, rather than individual HR practices, can match the RBT criterion of inimitability (e.g., Combs *et al.*, 2006; MacDuffie, 1995). Although competitors can adopt a given HR practice, such as a specific selection technique or a particular training program, it is considerably more difficult to implement a complex, integrated bundle of commitment-based HR practices (Barney and Wright, 1998; Boxall, 1996). Moreover, commitment-based HR system implementation tends to be path dependent, encompassing, for instance, linkages to supporting organizational cultures and complex interactions among the systems' HR practices. These characteristics lessen the ability of competitors to quickly imitate these HR systems, even in contexts where a commitment-based HR system's underlying principles are well understood. In other words, per RBT, the advantages conveyed by commitment-based HR systems may be a source of persistent competitive advantage (Crook *et al.*, 2008; Wright and Boswell, 2002).

Together, the value and inimitability of commitment-based HR systems can make them the type of strategic resource emphasized in RBT. Nevertheless, there are reasons to believe that the relationships of commitment-based HRM with firm performance are not always positive (e.g., Chadwick *et al.*, 2013). Thus, as we detail in the data section of this paper, we have been careful to choose an empirical context, Korea in the post-Asian Financial Crisis era, where commitment-based HR systems are likely to have generally positive effects on firm performance.

## TOP MANAGEMENT RESOURCE ORCHESTRATION, FIRM PERFORMANCE, AND THE MEDIATING ROLE OF COMMITMENT-BASED HR SYSTEMS

As defined by Helfat and her colleagues, asset orchestration begins with an overt commitment to the development and utilization of the asset (Helfat, 2007; cf. Sirmon *et al.*, 2011). As a conductor is an essential part of a symphonic performance, the CEO is instrumental in orchestrating strategic managerial action throughout the levels

of the firm (Ketokivi and Castañer, 2004; Sirmon *et al.*, 2011). Similarly, a number of scholars have discussed the influence of top managers on the implementation of HR practices (e.g., Fenton-O'Creevy, 2001; Hutchinson and Purcell, 2010; Stanton *et al.*, 2010). As with other organizational initiatives, research suggests that support from top management, both perceived and tangible, has a positive effect on employees deeper down the ranks and can facilitate the implementation of various HR practices. For example, Fenton-O'Creevy (2001) found that middle managers were more likely to express intent to support a strategic program when they perceived adequate support from the top. Additionally, in a recent case study, Stanton *et al.* (2010) found that effective communication and support from the CEO led to consistent messaging throughout the various levels of the firm. As a result of this consistency, HR practices were more effectively implemented and firm performance was enhanced.

This need for top management orchestration increases markedly when considering HR systems rather than individual HR practices. Indeed, commitment-based HR systems are widely argued to be administratively intensive, both at the point of initial implementation and consistently thereafter, and require constant central direction to retain these systems' internal alignment (e.g., Chadwick *et al.*, 2013). This may be particularly true of HR systems compared to other firm resources since there are a wide variety of strong institutional and technical contextual factors that are continuously shaping firms' sets of HR practices (e.g., Datta *et al.*, 2005). Simply put, given their complexity and comprehensiveness, it is exceedingly unlikely that integrated commitment-based HR systems will spring up within a firm of their own accord or from middle managerial action independent of top managers' emphasis. Thus, we posit that CEOs' emphasis on SHRM is an important antecedent to the implementation of commitment-based HR systems.

*Hypothesis 1: CEOs' emphasis on SHRM is positively related to their firms' use of commitment-based HR systems.*

### **The mediating role of middle management in operationalizing strategic resources**

Although top management tends to set the overall direction and strategic emphasis of the firm, the

responsibility for actually implementing strategy often falls to managers and employees lower down in the firm. Of special interest is the role played by middle managers, who are responsible for communicating top-level strategic initiatives to the lower ranks, a role that requires both a downward orientation and integrative abilities (Floyd and Wooldridge, 1992; Likert, 1961). Research focusing on the effects of middle management on firm-level outcomes has consistently suggested that middle managers play a significant role in the strategy process and that the successful integration of top-, middle-, and lower-level managerial actions can enhance firm performance (Wooldridge *et al.*, 2008). These findings suggest that in order to implement its strategic emphasis effectively, top management (particularly the CEO) must enlist the support of middle management and, by extension, those lower in the firm. It is not possible for top managers to implement a strategic initiative by themselves.

This may be especially true when firms implement commitment-based HR systems. Here, middle management's role is integral. For example, Currie and Procter (2001) suggest that middle management acts as link-pins between upper and lower management, helping to implement corporate HRM strategy, reduce employee resistance to change, and enhance horizontal communication with other middle managers in the firm. In another study examining the role of middle management in the linkage between strategic HRM and firm performance, Purcell and Hutchinson (2007) found that the way in which managers enacted HR practices enhanced employee attitudes and perceptions of the job experience. Additionally, Harney and Jordan (2008) found that managers were able to supplement traditional HR systems with "softer" management practices, such as instituting employee voice mechanisms, employing supplemental incentives, and encouraging mentoring relationships between experienced and new personnel. Consequently, loyalty to supervision had a strong effect on employee performance, leading the authors to conclude that "local commitment such as loyalty to supervisors may be more important than global, organizational commitment" (Harney and Jordan, 2008: 291). Looking at the implementation of employee involvement programs, Fenton-O'Creevy (1998) found that middle management resistance to such programs varied and depended on the individual



manager's background and beliefs and that resistance on the part of middle management could negatively affect the implementation of these programs.

In short, middle management is an important factor in strategic implementation and resource deployment, including the implementation of HR initiatives. Therefore, buy-in from the middle ranks can positively affect firm performance (Floyd and Wooldridge, 1992; Wooldridge *et al.*, 2008). Theoretical and empirical work from both strategy and HRM suggests that achieving middle management buy-in requires commitment, synchronization, and communication—i.e., orchestration—on the part top management, particularly the CEO. This is likely to be particularly true when implementing HR systems as opposed to individual HR practices. Thus, one important mechanism that transforms top management strategic emphasis with respect to commitment-based HRM into actual commitment-based HR systems is the active involvement of middle managers. Absent the active involvement of middle managers, top managers' strategic emphasis may remain unrealized. Hence, firms' implementation of commitment-based HR systems, particularly in a setting where such systems run counter to tradition, can be a tangible indicator of middle management buy-in to top managers' strategic emphasis. In other words, implementation of commitment-based HR systems can reflect resource orchestration.

Numerous published studies have reported positive relationships between commitment-based HRM and various types of firm performance (e.g., Combs *et al.*, 2006; Huselid, 1995), including lower turnover, higher employee productivity, and superior financial and stock market results (e.g., Arthur, 1994; Batt, 2002; Delery and Doty, 1996; Huselid, 1995; MacDuffie, 1995; Way, 2002; Youndt *et al.*, 1996). As we describe in the data section, this study's empirical context is amenable to commitment-based HR systems. Thus, we expect that commitment-based HR systems will be positively related to higher firm-level employee productivity, return on equity (ROE), and perceived performance, all outcomes that have been employed in extant SHRM research. More importantly, given our arguments regarding the dual importance of top management emphasis on SHRM and of middle management operationalization of this emphasis, we posit that

commitment-based HR systems are the mechanism through which CEO emphasis on SHRM positively affects these three measures of firm performance:

*Hypothesis 2: Commitment-based HR systems mediate the relationship between CEOs' emphasis on SHRM and firm performance.*

## DATA AND METHOD

The data for this study were collected in South Korea in 2006, a time of economic transformation in East Asia. Traditionally, the structural features of HRM systems in Korean firms were shaped by Confucian cultural values, including a strong work ethic, family orientation, harmony, solidarity, and continuous learning (Bae, 2012). These cultural values were manifested in Korean firms' paternalistic, authoritarian management styles emphasizing lifetime employment, seniority, hierarchy, and intensive employee training and development (e.g., Bae and Rowley, 2003; Tung, Paik, and Bae, 2013). Until the late 1980s, this type of HRM system had generally been effective because Korean firms had been operating in a relatively stable business environment and had focused on labor-intensive industries.

In the early 1990s, however, Korean firms, particularly large conglomerates such as Samsung and Hyundai, came under increasing pressure as their key product markets became more dynamic and globalized. Such markets increasingly favored quick responsiveness and high levels of employee discretionary effort and skill (Bae and Lawler, 2000). Consequently, Korean firms began experimenting with a so-called "New HRM System" (Bae, 1997), which included such HR practices as performance-based pay, rigorous performance appraisal, and team-based work in conjunction with traditional HR practices such as intensive training and development and long-term employment. These features of the Korean New HRM system were similar to those of commitment-based HRM systems in the U.S. and Europe. As in other parts of the world, this system faced resistance from labor unions and organizational members who were accustomed to the traditional Korean HRM system. Thus, in the early 1990s, this New HRM system was not widely adopted among Korean firms.

The event that drove broader transformation of Korean HRM systems from traditional to commitment-based HRM was the Asian Financial Crisis (AFC) that began in 1997 (e.g., Bae and Rowley, 2003) and lasted approximately two years in Korea. The reduced product market demand and soaring interest rates for short-term debt brought on by the AFC devastated Korean business activity, leading the Korean government and other economic actors to search for new ways to regain competitiveness. Given a decision to transform their HR systems, the model that some Korean firms chose to follow was commitment-based HRM. This response was driven by a number of factors, including Korean government pressure, benchmarking of HR systems in Western firms (which had been experimenting with commitment-based HRM), prescriptive literature from both practitioners and academics, advice from Western management consultants, hiring employees who had studied abroad regarding HRM, etc. For instance, studies in U.S. settings in this period demonstrated that authoritarian management tends generally to be less effective than commitment-based HRM (e.g., Arthur, 1994; Combs *et al.*, 2006). Consequently, by the early 2000s, economic conditions and institutional factors—coercive, mimetic, normative (DiMaggio and Powell, 1983)—contributed to the diffusion of commitment-based HRM system among Korean firms (Bae, 2012; Bae and Rowley, 2003). However, institutional factors and organizational inertia created variance in implementation across Korean firms, including firms that did not use such practices at all.

The commitment-based HRM systems that Korean firms adopted included selective staffing, relatively high levels of job security, and performance-based pay (i.e., individual incentive, merit pay, profit sharing), coupled with rigorous performance appraisal, employee participation, and team-based work. The prescriptions favoring commitment-based HRM emphasized employing such practices as integrated HR systems, and, by 2006, Korean HR managers had been increasingly professionalized by participating in major domestic and international HRM-related conferences such as those of the Society for Human Resource Management (SHRM) and the American Society for Training and Development (ASTD), where such prescriptive advice would be common. Thus Korean firms tended to implement

commitment-based HR practices as an integrated HR system rather than in piecemeal fashion.

Previously published research supports this generalization. For example, a study by Chang (2006) using data collected from 37 Korean firms between July 2000 and April 2001 reported that the reliability (an alpha coefficient) of the seven HR practices in their commitment-based HR system measure was 0.73. Similarly, Choi (2010) showed that the adoption levels of ability-enhancing HR practices (i.e., employee training and development, job rotation), motivation-enhancing HR practices (i.e., individual incentive, group-based incentive, pay-for-performance), and opportunity-enhancing HR practices (i.e., team-based work design, suggestion system), which are HR practices typically used in commitment-based HRM systems measures, were significantly correlated ( $p < 0.01$ ), in a cross-industry sample of 441 Korean firms.

Given the contrast with Korean firms' traditional authoritarian, paternalistic HR systems, Korea is a setting where commitment-based HRM is likely to have broadly positive effects on firm performance. Of course, as in other countries, only a subset of Korean firms had implemented commitment-based HR systems by 2006. However, because Korean firms tended to implement commitment-based HR practices as integrated systems, the contrast between firms that use commitment-based HR systems and those that do not is relatively more pronounced than it is in other contexts. In other words, not all Korean firms used commitment-based HR systems in 2006, but Korean firms tended either to use such systems or not, rather than implementing limited pieces of commitment-based HR systems. Korea is therefore a good setting to explore how CEOs' emphasis on SHRM influences their firms' HR practices and performance.

### Data collection and sample characteristics

Using membership information from the Korean Senior Human Resource Managers' Association and the Samsung Economic Research Institute's Human Resource Management Community, a research team and a coauthor identified 994 firms as candidates for this cross-sectional survey. For each of the 994 firms, an email address was obtained for a senior level human resource manager. To ensure the clarity of the survey questionnaire, a pilot study was conducted using nine firms. The rest of the survey was conducted by

email. This decision was made for two reasons: First, the survey items contained confidential information, such as turnover rates. To increase the likelihood that a firm would participate, the research team felt it was essential that the questionnaire be delivered directly to senior human resource managers. Second, the managers in the pilot study indicated a preference for email as opposed to paper-based mailing surveys.

A cover letter for the email survey explained that the purpose of the survey was to examine the relationship between management practices and firm performance. The cover letter also stressed that the study was being conducted strictly for research purposes, and, as such, all responses would remain confidential. A total of 190 firms participated in the survey, a 19.1 percent response rate, which is comparable to similar surveys (e.g., Datta *et al.*, 2005). As a check on sample bias, a logit model for response to the survey was utilized (cf. Batt, 2002). Results from this model indicated that response to the survey was not related to firm productivity (sales per employee) or to ROE (since perceived performance is from the survey, data for this variable from nonrespondents are not available), or to key firm attributes, although larger firms were more likely to respond to the survey, ( $p < 0.05$ ). Accordingly, we control for firm size below.

Of the 190 firms in our analysis, 91 were in manufacturing industries. The other 99 firms operated in nonmanufacturing industries such as telecommunication and retail sales. The mean size of firms (in employees) was 2,738; 5.8 percent of the sample firms did not report firm size, 6.3 percent of the sample firms had 31–99 employees, 32.1 percent of the sample had firms 100–499 employees, 18.4 percent of the sample firms had 500–999 employees, and 37.4 percent of the sample firms had more than 1,000 employees.

### Dependent variables

We measured firm performance with three different variables: employee productivity, return on equity (ROE), and perceived performance.

#### *Employee productivity and ROE*

It is commonly asserted in the HRM literature that analyses employing firm-level labor productivity

and other intermediate indicators of firm performance are more likely to find significant relationships with HR systems than analyses using more distal measures of firm performance such as financial accounting (e.g., return on equity) and capital market (e.g., Tobin's  $q$ ) outcomes (cf. Boselie *et al.*, 2005; Huselid, 1995). In fact, HRM scholars have described firm-level productivity as “the crucial indicator of workforce performance” (Datta *et al.*, 2005: 139). As a check on this assertion, we include both firm-level productivity and ROE in our analysis. Consistent with prior HRM research, our productivity measure is annual sales for 2006 (in Korean won) divided by the number of employees in the workforce (Datta *et al.*, 2005; Guthrie, 2001), since sales and firm size are positively correlated. Because both sales and number of employees were nonnormal, we use the natural logarithm of this productivity measure. We also divided the sales number by 1,000 to decrease the difference in the scales of the variables in the analysis (we return to this issue in the magnitude calculation in the Results section). Return on equity data were taken from a database built by the Korea Information Service, which collaborates with Moody's to provide information on firms operating in South Korea for an international audience (Chang, 2003).

#### *Perceived performance*

Previous HRM research has also employed key respondents' perceptions of firm performance, which tends to be positively correlated with financial performance but can sometimes differ from both productivity and financial performance. Hence, comparisons between coefficients for perceived performance and the other two dependent variables may be enlightening. Additionally (and more subtly), the coefficients estimated in our structural equation models (SEMs) below are, as in all SEMs, conditional on the coefficients estimated for the other variables included in the model, including survey respondents' perceptions of their firms' performance. In other words, including respondents' perceptions of performance in the model allows us to account for them and thus achieve estimates of the other relationships in the model that are less biased by respondents' performance perceptions.

Perceived firm performance is composed of six items (Delaney and Huselid, 1996), each measured on a five-point Likert-type scale, where 1 meant “strongly disagree” and 5 meant “strongly agree”. Items include (P1) “customer satisfaction of our products and service is higher than that of our competitors”; (P2) “our employees are more committed to our organization than our competitors’ employees”; (P3) “the quality of our products and services is higher than that of our competitors”; (P4) “our organization has more ability to attract and retain essential employees than our competitors”; (P5) “job satisfaction of our employees is higher than that of our competitors’ employees”; and (P6) “work productivity of our employees is higher than that of our competitors’ employees”. The internal reliability of this construct is 0.86.

### Independent variables

#### *CEO emphasis on SHRM*

A scale measure of CEO emphasis on SHRM was not available from previous studies. Thus, we developed a scale measure with seven items that were adapted from previous studies that assessed constructs such as management’s values on HRM (Bae and Lawler, 2000; Bennett, Ketchen, and Schultz, 1998; Osterman, 1994) and CEO (leadership) support for SHRM (Sheehan *et al.*, 2007). Together, these items measure how much stress the firm’s CEO places on achieving competitive advantage through leveraging human resources. Each item was measured on a five-point Likert-type scale, where 1 meant “strongly disagree” and 5 meant “strongly agree”. These items include (C1) “in this organization, the CEO publicly praises employees or groups that achieved challenging goals”; (C2) “in this organization, the CEO emphasizes fair procedures and treatment in human resource practices such as pay raises and promotion”; (C3) “in this organization, the CEO pays much attention to the adoption of different kinds of HR practices that contribute to organizational performance”; (C4) “in this organization, the CEO spends much time in HR-related activities (for example, staffing, training and development, performance appraisal, pay raises, etc.)”; (C5) “in this organization, the CEO regards the human resource department as a strategic partner”; (C6)

“for a long time, the organization (top management) has viewed employees as a source of competitive advantage”; and (C7) “for a long time, this organization has put much value in employees’ growth and well-being”. The internal reliability of this construct is 0.90.

#### *Commitment-based HR system*

As we noted in discussing HR systems earlier in the paper, the conceptual distinction between a group of HR practices and a coherent system of HR practices has been made repeatedly in the SHRM literature. In SHRM research, the existence of an HR system is typically established first by a theoretic rationale for assuming that the HR practices “bundle” together (e.g., MacDuffie, 1995). The most common theoretic rationale that is employed for such purposes is that of a commitment-based HR system, and the set of HR practices that we use to establish this system in our dataset is consistent with these definitions (Posthuma *et al.*, 2013).

With an eye toward the HR practices that are most applicable to the Korean context, we employed commitment-based HR practices from measures used in previous studies in the HRM literature (e.g., Delery and Doty, 1996; Snell and Dean, 1992; Wright, Gardner, and Moynihan, 2003). All survey questions were constructed with a five-point Likert-type scale, where 1 meant “strongly disagree” and 5 meant “strongly agree”.

We measured *staffing* with three items: (1) “selects people according to highly refined selection criteria and procedures”; (2) “hires people by utilizing different kinds of selection tools (for example, interviews, aptitude tests, written exams, etc.)”; (3) “invests money in order to select the right people”.

We measured *training* with three items: (1) “provides employees with a variety of training and development opportunities”; (2) “invests heavily in employee training and development”; (3) “provides employees with structured formal training and development programs”.

We measured *performance appraisal* with four items: (1) “has an effective formal performance appraisal system to evaluate employees’ performance and competencies”; (2) “appraises employees’ performance with objective and quantitative criteria (for example, management by objectives)”; (3) “utilizes the results of performance appraisal in



deciding pay raises or promotions of the employees"; (4) "appraises employees' performance based on their objective achievement".

We measured *pay for performance* with four items: (1) "bases pay raise decisions on employee performance"; (2) "has wide range in pay within a same job grade"; (3) "extensively utilizes a company-wide profit-sharing and/or a gain-sharing program"; (4) "utilizes a reward system based on seniority" (reverse-coded).

We measured *job design* with two items: (1) "provides employees with opportunities to work flexibly (for example, flexible work schedule)"; (2) "flexibly assigns the scope and responsibilities of jobs, based on employees' skills and needs".

We measured *communication and participation* with four items: (1) "Utilizes formal programs through which employees can participate in organizational activities (e.g., work council)"; (2) "provides employees with opportunities to participate in decision making and problem solving related to the job"; (3) "shares various information with employees (e.g., business strategy and financial status)"; (4) "listens to employees' opinions through different kinds of formal or informal programs (e.g., attitude surveys)".

The second (and complementary) way that HR systems are established is with statistics assessing the internal reliability of the HR system measure. Following a subscale aggregation approach, we calculated the mean scores of each subscale of HR practices. These subscale means were then used as indicators of the commitment-based HR system latent variable. This is a common approach in confirmatory factor analysis (CFA), as recommended by Little *et al.* (2002) and is consistent with other HRM/firm performance studies such as Chuang and Liao (2010).

Supporting our suggestion that Korean firms tended to implement commitment-based HRM as integrated systems at the time the data were collected, the internal reliability of this construct is 0.87. This statistic indicates that sample firms' commitment-based HR practices covary strongly, and it is higher than the reliabilities that are typically reported for such measures in U.S. data, which often range between about 0.6 and 0.8. This is good evidence that the HR practices in question should be aggregated into a single measure, as the intercorrelations between these HR practices are such that using them as a set of independent variables would cause significant

collinearity problems. This internal reliability is, in turn, commonly taken in SHRM research as evidence that the HR practices in question do, indeed, function as an HR system. Moreover, conceptually, there are no HR practices within this system that are working at obvious cross-purposes, so there are no reasons to expect that these HR practices do not work in similar ways to influence firm performance.

### Control variables

To focus our analysis on the relationships of interest, we control for a number of factors that could be correlated both with firm performance and either CEO emphasis on SHRM or commitment-based HRM in the Korean context. For example, previous SHRM research has indicated that firm size and firm age are both positively related to firm performance and to the adoption of commitment-based HRM (e.g., Guthrie *et al.*, 2009; Huselid, 1995). Consistent with existing HRM/firm performance research, firm size was measured as the natural log of the number of employees in a firm's workforce. Firm age was measured as the number of years that a firm had been in operation by 2006.

We also used a dummy control for the presence of a union, which can affect both firm-level labor productivity (Freeman and Medoff, 1984) and firms' adoption of commitment-based HRM (e.g., Datta *et al.*, 2005; Guthrie *et al.*, 2009). Previous HRM research has also controlled for capital intensity, which is often positively correlated with firm performance and firms' use of commitment-based HRM (e.g., Koch and McGrath, 1996). Capital intensity was measured as the natural logarithm of fixed assets divided by total number of employees for 2006. Moreover, since Datta *et al.* (2005) and others have demonstrated that manufacturing firms tend to use commitment-based HRM more frequently, we employ a dummy variable that indicates whether a firm is in a manufacturing industry.

Lastly, to isolate our analysis on the influence of CEO emphasis on SHRM, we control for mimetic isomorphism (DiMaggio and Powell, 1983) in the Korean context with a construct labeled "imitation". Each of the six items for imitation was measured on a five-point Likert-type scale, where 1 meant "strongly disagree" and 5 meant "strongly agree". Five of these items, concerning how

much respondent firms' HR practices are copied from other successful firms, were developed by Kwon, Jeong, and Bae (2010) for another study set in Korea. The other imitation item concerns how much respondent firms benchmark their HR practices to those of other Korean firms (please see Appendix S1 for details on all six of these items). The internal reliability of this construct is 0.90.

### Confirmatory factor analysis

To evaluate the appropriateness of our measurement model (Brown, 2006), we used MPLUS version 7 (Muthen and Muthen, 1998–2011) to conduct a confirmatory factor analysis (CFA). We estimated a CFA that included all of the study's hypothesized latent constructs (e.g., perceived firm performance), CEO emphasis on SHRM, imitation, and commitment-based HR systems. The CFA also included the single-item indicators of firm performance as well as the single item control variables. (Per convention, we did not include the dummy variables of union presence or industry in our CFA, but these variables appear in the SEM analysis that we use for hypothesis testing.)

We represented two of our latent constructs, mimetic isomorphism and perceived firm performance, through the use of parceled (i.e., composite indicators). Because composite indicators exhibit strong reliability and a large ratio of common-to-unique factor variance, they are recommended in cases where multiple items represent a single-dimensional latent construct (Little *et al.*, 2002). The items included in each composite are detailed

in the Appendix S1. Results for the latent constructs in the CFA, as well as overall CFA model fit statistics, are reported in Appendix S1, Table 1, available online at the *Strategic Management Journal* website.

The original CFA provided an adequate fit to the data. However, inspection of the CFA modification indices revealed some slight changes that we could make, most notably in dropping item C7 ("for a long time, this organization has put much value in employees' growth and well-being"), that improve the final model fit ( $\chi^2[198, n = 190] = 311.1, p < 0.001$ ; RMSEA = 0.055, CFI = 0.95, SRMR = 0.052, NNFI = 0.94). Estimated correlations between latent constructs are not excessively high, providing evidence of convergent and discriminant construct validity (Kline, 2005). As an additional check on our measurement model, we conducted exploratory factor analysis in SPSS using maximum likelihood factor extraction with varimax rotation and kaiser normalization. The hypothesized factor structure in our CFA was replicated in this analysis (available upon request). The factor loadings from this CFA track closely with the factor loadings reported for our SEM model below.

## RESULTS

Table 1 reports the means, standard deviations, and correlations among the study variables. As expected, a number of the control variables, such as firm size, firm age, and capital intensity,

Table 1. Descriptive statistics and bivariate correlation matrix (internal reliabilities in parentheses)

	Mean	Std. dev	1	2	3	4	5	6	7	8	9	10	11
1. Employee productivity	13.10	0.91	—										
2. ROE	13.09	18.87	0.06	—									
3. Perceived firm performance	3.54	0.62	0.23**	0.19*	(0.86)								
4. Firm size	6.59	1.51	0.22**	0.01	0.23**	—							
5. Firm age	2.91	0.82	0.24**	−0.25**	−0.01	0.40**	—						
6. Capital intensity	5.25	1.23	0.51**	−0.27**	0.10	0.36**	0.29**	—					
7. Manufacturing	0.47	0.50	−0.03	−0.26**	−0.01	−0.01	0.14	0.14	—				
8. Unionization	0.41	0.49	0.25**	−0.07	0.01	0.29**	0.27**	0.21**	0.15*	—			
9. Imitation	3.24	0.75	0.14	0.10	0.21**	0.26**	0.09	0.03	0.02	0.02	(0.90)		
10. CEO emphasis on SHRM	3.68	0.76	0.10	0.10	0.58**	0.23**	0.08	0.05	−0.08	−0.15*	0.25**	(0.90)	
11. Commitment-based HR system	3.40	0.62	0.24**	0.15*	0.60**	0.30**	0.04	0.08	−0.07	−0.23**	0.28**	0.66**	(0.87)

Note: The tabled values are raw means, standard deviations, and correlations. These descriptive statistics were generated using SAS 9.2. n = 190.

\*\* $p < 0.01$ ; \* $p < 0.05$  (two-tailed tests)

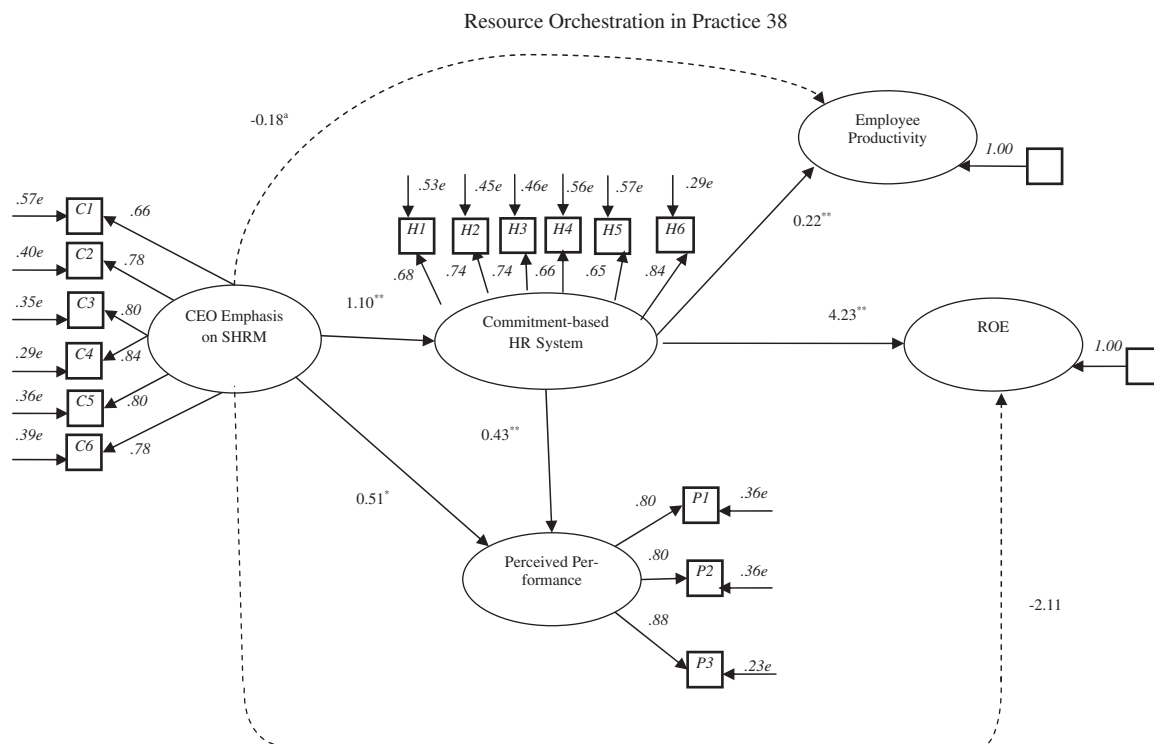


Figure 1. Results for the structural equation model.

Model fit:  $\chi^2_{[236]} = 423.5$ ,  $p < 0.001$ ; RMSEA = 0.065; SRMR = 0.066; CFI = 0.92; NNFI = 0.90;  $n = 190$ ; \* $p < 0.05$  level; \*\* $p < 0.01$  level.

Note: Significant paths denoted by solid arrows; nonsignificant paths denoted by dashed arrows. <sup>a</sup> $p < 0.09$ .

Indirect Effects: CEO Emphasis on SHRM → Commitment-based HR → Employee Productivity ( $\beta = 0.25$ ,  $p < 0.01$ ), ( $CI = (0.07, 0.52)$ ,  $p < 0.01$ )

CEO Emphasis on SHRM → Commitment-based HR → ROE ( $\beta = 4.63$ ,  $p < 0.01$ ), ( $CI = (0.24, 10.11)$ ,  $p < 0.01$ )

CEO Emphasis on SHRM → Commitment-based HR → Perceived Performance ( $\beta = 0.47$ ,  $p < 0.01$ ), ( $CI = (0.01, 1.02)$ ,  $p < 0.01$ )

are positively correlated with both employee productivity and commitment-based HR systems, though, perhaps surprisingly, firm age and capital intensity are negatively correlated with ROE. Consistent with prior findings, unionization is positively correlated with employee productivity but negatively correlated with commitment-based HR systems. CEO emphasis on SHRM is positively correlated with all three dependent variables as well as with most of the control variables and with commitment-based HR systems, and negatively correlated with unionization.

### Structural equation modeling results

To assess our hypothesized SEM, we again used MPLUS version 7 (Muthen and Muthen, 1998–2011). In this dataset, 1.33 percent of the data are missing. To impute the missing data, we

invoked a full information maximum likelihood estimator (Little and Rubin, 1987; Schafer and Graham, 2002). Figure 1 reports results for our main SEM model.

The fit statistics for the model in Figure 1 indicate an acceptable fit to the data ( $\chi^2_{[236]} = 423.5$ ,  $p < 0.001$ ; RMSEA = 0.065, CFI = 0.92, SRMR = 0.066, NNFI = 0.90). As Figure 1 reports, CEO emphasis on SHRM is positively and significantly related to the commitment-based HR system latent variable ( $\beta = 1.10$ ,  $p < 0.01$ ) and to perceived performance ( $\beta = 0.51$ ,  $p < 0.05$ ). The direct relationships between CEO emphasis on SHRM and employee productivity and ROE are not significant, though the direct relationship with employee productivity is close to conventional significance ( $\beta = -0.18$ ,  $p < 0.09$ ). In contrast, the commitment-based

HR system variable has positive and significant relationships with employee productivity ( $\beta = 0.22$ ,  $p < 0.01$ ), ROE ( $\beta = 4.23$ ,  $p < 0.01$ ), and perceived performance ( $\beta = 0.43$ ,  $p < 0.01$ ).

The magnitudes of these estimated relationships are meaningfully large. As we noted above, the CEO emphasis on SHRM and the commitment-based HR system variables are each measured on a five-point scale. Thus, a one-point increase in the CEO emphasis on the SHRM variable is associated with a 1.10 point increase in the commitment-based HR system variable and with a 0.51-point increase in perceived performance. Additionally, a one-point increase in the commitment-based HR system is associated with a 4.23 percent increase in ROE and 0.43-point increase in perceived performance.

Since employee productivity is logged, interpreting the magnitudes of its relationships in the model is a little less straightforward. For sample firms at the mean level of employee productivity, a one-point increase in the commitment-based HR system is associated with an increase in sales per employee of 120,318 Korean won. For sample firms one standard deviation below the mean level of employee productivity, a one-point increase in the commitment-based HR system variable is associated with an increase in sales per employee of 48,431 Korean won. The same calculation for sample firms one standard deviation above the mean level of employee productivity is an increase in sales per employee of 298,907 Korean won. The Korean won/ U.S. dollar exchange rate at the end of 2006 was 928.9. Recall that we divided our original sales figures by 1,000. Thus, to translate the magnitudes in this paragraph into 2006 US dollars, we can multiply each estimate by 1,000 and then divide it by 928.9, which tracks closely to the Korean won figures. For example, a one-point increase in the commitment-based HR system for sample firms at the mean level of employee productivity is associated with an increase in sales per employee of \$129,527 U.S.

For parsimony, results for the control variables are not depicted in Figure 1, although the controls were included in the estimated SEM. Specifically, in this model, employee productivity is positively related to capital intensity ( $\beta = 0.37$ ,  $p = 0.00$ ) and unionization ( $\beta = 0.49$ ,  $p = 0.00$ ) and is negatively related to firm size ( $\beta = -0.11$ ,  $p = 0.05$ ) and industry ( $\beta = -0.27$ ,  $p < 0.05$ ). ROE is positively related to unionization ( $\beta = 6.29$ ,  $p < 0.05$ )

and negatively related to firm age ( $\beta = -4.56$ ,  $p < 0.01$ ), capital intensity ( $\beta = -3.56$ ,  $p < 0.01$ ), and industry ( $\beta = -5.50$ ,  $p < 0.05$ ). Perceived performance is positively related to unionization ( $\beta = 0.60$ ,  $p < 0.01$ ) and negatively related to firm age ( $\beta = -0.25$ ,  $p < 0.10$ ).

### Mediation assessment

To examine further the mediation described in Hypothesis 2, we estimated an alternative model, a direct effects SEM. This alternative SEM is identical to the mediated model depicted in Figure 1 except that the commitment-based HR systems construct is omitted (available upon request). Although this model also has acceptable overall fit statistics ( $\chi^2[241, n = 190] = 463.2$ ,  $p < 0.001$ ; RMSEA = 0.070, CFI = 0.91, SRMR = 0.074, NNFI = 0.89), the more fully specified Figure 1 model is a significantly better fit to the data (for the difference between these two models,  $\Delta\chi^2_{(5, n = 190)} = 39.7$ ,  $p < 0.001$ ). In this model, the nonmediated relationships between CEO emphasis on SHRM and the three dependent variables are all positive, and these relationships are significant for ROE ( $\beta = 2.88$ ,  $p < 0.05$ ) and for perceived productivity ( $\beta = 0.99$ ,  $p < 0.01$ ). In contrast, the coefficient for the relationship between CEO emphasis on SHRM and employee productivity is positive but lies outside conventional levels of significance ( $\beta = 0.09$ ,  $p < 0.17$ ).

A comparison between the results reported in this model with those in Figure 1 is revealing. In the mediated model (Figure 1), the direct relationship between CEO emphasis on SHRM and employee productivity is also not significant ( $\beta = -0.18$ ,  $p < 0.09$ ). Additionally, the direct path between CEO emphasis on SHRM and ROE is nonsignificant in the mediated model ( $\beta = -2.11$ ,  $p < 0.32$ ); and the direct path between CEO emphasis on SHRM and perceived performance has a smaller coefficient, though it remains significant in Figure 1 ( $\beta = 0.51$ ,  $p < 0.05$ ). Thus, these results suggest that omitting the commitment-based HR systems construct from the model may lead to overstatements about the effects of CEO emphasis on SHRM on firm performance.

### Estimation of indirect effects

Per convention, we invoked the bootstrapping option in MPLUS version 7 (Muthen and Muthen,



1998–2011) to obtain biased-corrected confidence intervals for each estimated parameter in the mediated model depicted in Figure 1 (Preacher and Hayes, 2004). We were then able to calculate coefficients and significance levels for the mediated pathways between CEO emphasis on SHRM and the dependent variables. Thus, a one-point increase in the CEO emphasis on SHRM variable is associated with a 4.63 percent increase in ROE ( $\beta = 4.63$ ,  $p < 0.01$ ; CI = 0.24, 10.11,  $p < 0.01$ ) and a 0.47-point increase in perceived performance ( $\beta = 0.47$ ,  $p < 0.01$ ; CI = 0.014, 1.02,  $p < 0.01$ ).

The indirect pathway between CEO emphasis on SHRM, the commitment-based HR system, and employee productivity is also significant ( $\beta = 0.25$ ,  $p < 0.01$ ; CI = 0.07, 0.52,  $p < 0.01$ ). For sample firms at the mean level of employee productivity, a one-point increase in the CEO emphasis on the SHRM variable is associated with an increase in sales per employee of 138,872 Korean won. For sample firms one standard deviation below the mean level of employee productivity, a one-point increase in the CEO emphasis on the SHRM variable is associated with an increase in sales per employee of 55,900 Korean won. The same calculation for sample firms one standard deviation above the mean level of employee productivity is an increase in sales per employee of 345,003 Korean won. Thus, the indirect pathways results support Hypothesis 2.

## DISCUSSION

The portrait of competitive advantage sketched out by this study is an intuitively appealing one. Top managers can define their firm's course by setting priorities and marshaling resources for a given strategic emphasis. This strategic emphasis is, as illustrated by the results for the alternative model that omits the commitment-based HR system, a significant determinant of operational (productivity), financial (ROE), and perceived firm performance. However, our model in Figure 1 demonstrates that top managers' strategic emphasis alone does not strongly affect firm performance. Rather, the impact of top managers' strategic emphasis on firm performance is realized through related strategic resources. While we do not wish to read too much into nonsignificant results, the degree to which the direct relationships between CEO emphasis on SHRM and the dependent variables

decline between the alternative model and Figure 1 exceeds our expectations, underscoring this point.

Interpreting these results within the theoretic discussion at the beginning of this paper, we consider CEOs' emphasis on SHRM, without operationalization as a commitment-based HR system, to be merely strategic intent. Strategic *orchestration* through the depths of the firm, on the other hand, occurs when top managers' strategic emphasis is carried out by other actors within the firm, particularly middle managers. Of course, luck, inherited resource endowments, and middle management action on its own can also lead to strategically valuable resources (cf. Barney, 1986; Wooldridge, Schmid, and Floyd, 2008), but this is probably rare in the case of commitment-based HR systems, which demand sustained and coordinated organizational effort for successful implementation (Fenton-O'Creevy, 2001; Purcell and Hutchinson, 2007; Stanton *et al.*, 2010). Consequently, as we noted earlier, it is exceedingly unlikely that commitment-based HR systems will spring up within a firm of their own accord or from middle managerial action independent of top managers' emphasis.

Interestingly, the direct relationship between CEOs' emphasis on SHRM and perceived performance is still significant in the main (mediated) model depicted in Figure 1. While perceived performance is positively and significantly correlated with the other two dependent variables, these correlations are modest and leave a great deal of the variance in the relationships among these three variables unexplained. Indeed, the significant coefficient for this relationship in the Figure 1 model implies that our respondents may implicitly believe that top management's strategic emphasis in itself drives higher firm performance. The contrast between this result and those for employee productivity and ROE suggest that care should be taken in interpreting results in HRM research that only employs perceived measures of firm performance (cf., Wall *et al.*, 2004).

Additionally, our results have some important intersections with other streams of research in the strategy field. For example, this paper's findings may be capturing an element of dynamic capabilities, as Helfat *c* (2007) anticipated. It may be the case, for instance, that middle managers' ability to implement top management's strategic initiatives is a firm-level capability that generalizes

across many different strategic resources. Scholars from the middle management perspective (e.g., Floyd and Wooldridge, 1992) have also emphasized the role of middle managers in explaining firm performance. Future strategic orchestration research could benefit from data that allows researchers to examine directly middle managers' role in creating and maintaining strategic resources such as commitment-based HR systems. A similar opportunity exists in mapping out top managers' specific strategic orchestration activities.

Furthermore, upper-echelons researchers for some time have argued that top managers play a key role in generating firm-level heterogeneity. However, the extant upper-echelons research has stressed the role of top managers' inherent attributes, such as their demographic profiles, personalities, and fundamental values, in this process. These characteristics' influence may be largely tacit and intuitive. In contrast, our focus in this paper has been on top managers' strategic emphasis, which has an explicitly conscious character. Thus, while it would be a mischaracterization to describe this paper as an upper-echelons study, it is possible that strategic emphasis is a relatively unexamined mediator between top managers' essential characteristics and firm-level resource heterogeneity that could be employed in future upper-echelons research.

## Limitations

One limitation of this analysis is its emphasis on commitment-based HR systems. Although the Korean context in 2006 is an amenable setting for commitment-based HR systems, it's possible that other contexts might find more varied relationships between top managers' strategic intent and different types of HR systems than we do here. Additionally, we note that this study's measure of strategic emphasis is a response from a key member of the top management team, the senior HR manager, but that future research on strategic orchestration could benefit from measures that capture top managers' self-reports of their strategic emphases. Similarly, more direct measures of middle management involvement could strengthen future research.

Using senior HR managers as the survey respondents also introduces the possibility of common method bias, which may partially account for the significant direct effect between CEO emphasis

on SHRM and perceived performance and may also influence the survey responses that were used to construct employee productivity. However, common method bias is not an explanation for the relationships with ROE, as that variable came from a different source than the survey. As an analytic check on the common method concern, we ran a CFA that loaded all survey variables onto a single factor (Korsgaard and Roberson, 1995; Mossholder *et al.*, 1998). The fit of this model is quite poor, suggesting that common method bias is not a substantive threat to our findings.

Given the many institutional factors favoring commitment-based HRM in Korea, it's possible that our HR manager respondents could want to attribute a "progressive" strategic emphasis on SHRM to their CEOs and, at the same time, also characterize their HR practices as fitting an idealized commitment-based HRM model as identified by consultants and other influential parties—a type of social desirability bias. Fortunately, the relationships estimated in the paper's models are conditional on the degree to which firms are consciously copying the HR practices of other firms, helping to mitigate this possibility.

Relatedly, it is possible that some reciprocal causation exists because our respondents hold implicit theories about how CEO emphasis on SHRM, commitment-based HR systems and firm performance are positively related. Our cross-sectional data are unable to resolve this issue, but we note that the essential changes in estimated relationships that we observe between the model in Figure 1 and the alternative model that we estimated occur regardless of whether we specify CEO emphasis on SHRM or commitment-based HR systems as the mediating variable (alternative results available upon request). In our opinion, it is hard to imagine how spurious correlation stemming from respondents' implicit causal theories can account for the commitment-based HR system's consistent mediating role between CEOs' emphasis on SHRM and firm performance. Rather, it is more likely that respondents' implicit theories would cause all three types of constructs to be more positively correlated than they would otherwise be.

## CONCLUSION

The findings in this study have a great deal of intuitive appeal. They describe a "double sided"

view of strategic resource development, emphasizing the contribution of top managers' strategic emphasis along with middle managers' role in operationalizing that emphasis. This is the essence of resource orchestration through the depths of the firm. This study also furthers the linkages between strategy and HRM by underscoring the potential for HR systems to function as strategic resources. According to RBT, in order to achieve a sustainable competitive advantage, firms must have resources that are valuable, rare, difficult to imitate, and nonsubstitutable (VRIN) (Barney, 1991). Strategic resources that strongly match the VRIN criteria within RBT may spring up of their own accord, but it is neither theoretically interesting nor practically helpful to suggest that managers should wait around for this to happen. Instead, there is great value in improving our understanding about how managers consciously contribute to the development of strategic resources, and this study is a step in that direction.

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## SUPPORTING INFORMATION

**Additional supporting information may be found in the online version of this article:**

**Appendix S1.** Measure items of selected variables.