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## Human Resource Practices and Firm Performance in China: The Moderating Roles of Regional Human Capital Quality and Firm Innovation Strategy

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**ABSTRACT** We conducted two studies to investigate the contingent role of regional human capital quality (i.e., the knowledge, skills, and abilities of the collective workforce in a region) in the relationship between firm-level human resource (HR) practices (i.e., practices focusing on employees' human capital development) and firm performance in China. Drawing upon human capital theory, we hypothesized that the human capital-enhancing HR practices and regional human capital quality have a substitutive effect on firm performance. Study 1 uses a World Bank survey of 9,125 firms in 30 provinces. We found that the human capital-enhancing HR practices relate more strongly to firm performance when regional human capital quality was lower than when it was higher. Study 2 used a sample of 203 firms across seven provinces. We found similar results. We further hypothesized and found that the substitutive effect of regional human capital quality was stronger when a firm adopted an innovation strategy. Our findings provide new evidence for the contingency perspective of strategic HR management and highlight the importance of matching HR practices with local labor quality conditions and the business strategy of the firm.

**KEYWORDS** firm performance, human capital-enhancing HR practices, innovation strategy, regional human capital, strategic HR management

### INTRODUCTION

The contingency perspective of strategic human resource management (HRM) suggests that the impact of human resource (HR) practices on employee and firm performance is dependent on many factors (Jackson & Schuler, 1995; Lengnick-Hall, Lengnick-Hall, Andrade, & Drake, 2009). Drawing upon this perspective, empirical research has demonstrated that the effectiveness of HR practices is

affected by internal factors, including business strategies (Andersen, Cooper, & Zhu, 2007; Delery & Doty, 1996; Ji, Tang, Wang, Yan, & Liu, 2012), ownership structures (Ding & Akhtar, 2001; Law, Tse, & Zhou, 2003; Wei & Lau, 2008), and organizational culture (Chan, Shaffer, & Snape, 2004), and external factors, such as industry characteristics (Datta, Guthrie, & Wright, 2005) and labor market flexibility (Michie & Sheehan-Quinn, 2001). Furthermore, this contingency perspective is related to a recent emphasis on examining the fit between HR practices and their operating contexts (Su & Wright, 2012; Warner, 2012), which has become increasingly vital given that globalization has facilitated the rapid spread of strategic HRM from west to east. However, our knowledge about the effectiveness of HR practices in different socioeconomic and cultural environments remains limited. Preliminary evidence and discussion has indicated that context matters (Akhtar, Ding, & Ge, 2008; Kim & Wright, 2011; Wei & Lau, 2008), but more studies are needed to understand how socioeconomic and cultural contexts may influence the effectiveness of HR practices.

The primary goal of this article is to examine the fit between the human capital quality of the regional labor market and human capital-enhancing HR practices in China. The phrase 'human capital-enhancing HR practices' refers to a bundle of HR practices that represent organizational investment in employee human capital (Kwon & Rupp, 2013; Youndt, Snell, Dean, & Lepak, 1996), defined as employee knowledge, skills, and abilities, or 'KSAs' (see Coff, 2002). The strategic HRM literature suggests that recruiting, developing, and retaining high-quality human capital contributes to better organizational performance (Combs, Liu, Hall, & Ketchen, 2006; Jiang, Lepak, Hu, & Baer, 2012b). Despite these promising findings, past research did not seriously consider how the relationship between HR practices and human capital in organizations can be influenced by the human capital level in external labor markets. This issue is worth exploring because prior research suggested that regional factors (e.g., education investment from local governments) may influence the human capital quality in organizations (Crook, Todd, Combs, Woehr, & Ketchen, 2011) as well as the relationship between HR practices and performance outcomes (Ding & Akhtar, 2001; Law et al., 2003; Wei & Lau, 2010). These studies suggest that human capital in external labor markets may either complement (by providing different KSAs) or substitute for (by providing similar KSAs) the impact of firms' HR practices in organizations. An in-depth examination of this issue can offer a better understanding of how HR practices can help firms gain competitive advantages in the marketplace and whether a buying approach or an internal development approach to attaining high-quality human capital is more appropriate in a certain local context.

We draw upon the human capital theory (Becker, 1964) and propose that the regional human capital quality (defined as the KSAs of the collective workforce in a particular region) will have a substitutive effect on the relationship between firms' human capital-enhancing HR practices and firms' financial performance in China. Previous studies treated regional settings as a stable or consistent environment.

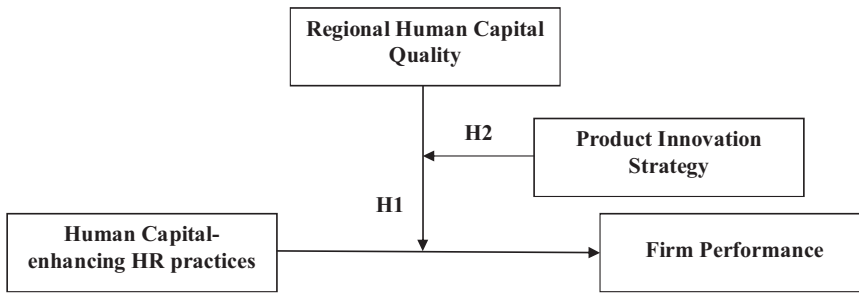


Figure 1. A framework of contingencies of HR practices on firm performance

However, the fact that China has large provincial disparities (Cooke, 2011; Wu & Wei, 2013), as a consequence of nonlinear economic and social transformation during the last three decades (Child & Tse, 2001), provides a natural opportunity to examine the role of regional human capital quality in the relationship between human capital-enhancing HR practices and financial performance.

Furthermore, we extend our ‘fit’ examination by incorporating business strategy. Past research shows that investment in human capital is aligned with an innovation strategy (Katou, 2010; Lee, Lee, & Wu, 2010), defined as a business strategy for new products or services different from those offered by competitors (Schuler & Jackson, 1987). Since an innovation strategy allows the collective human capital in organizations to contribute to business performance (Ding & Akhtar, 2001; Shipton, West, Dawson, Birdi, & Patterson, 2006), we expect that it magnifies the substitutive effect of regional human capital quality. Figure 1 shows our research model.

This study aims to make two contributions to the literature on strategic HRM. First, by focusing on the regional human capital quality in China, we propose and test a model that extends our knowledge of the boundary conditions of the influence of firms’ HR practices on firm performance. By doing so, we respond to Hesketh and Fleetwood’s (2006) call to explore the role of institutional environments in strategic HRM research. In an era of global economy, it is important to take regional settings (e.g., the characteristics of local labor markets) into account when understanding and evaluating HRM effectiveness. Second, by considering the joint contingency of regional human capital quality and firm-level innovation strategy, we go beyond previous research focusing on either internal factors (e.g., business strategies, Youndt et al., 1996) or external environments (e.g., industry characteristics, Datta et al., 2005). This offers an understanding of how internal and external factors jointly influence the relationship between firm-level HR practices and firm financial performance.

## THEORETICAL BACKGROUND AND HYPOTHESES

### Human Capital–Enhancing HR Practices and Firm Performance

Researchers have adopted several terms to describe HR systems, such as high performance (e.g., Huselid, 1995) and high commitment (Arthur, 1994). Although

the specific practices constituting such HR systems vary across studies, several practices are common. Youndt et al. (1996) included four HR practices in the category of human capital enhancing: selective staffing, comprehensive training, development-based performance appraisal, and skill-based compensation. Kwon and Rupp (2013) included extensive selection, training, and incentive-based pay. Gardner, Wright, and Moynihan (2011) focused on recruitment and training practices. Jiang et al. (2012b) suggested comprehensive recruitment, rigorous selection, and extensive training.

All the HR practices mentioned above have the potential to improve the quality and capability of firms' human capital. For example, qualified and capable candidates can be selected through market-based recruitment channels such as campus recruitment and professional headhunting agencies (Benson & Zhu, 2002). Extensive training and development programs enable employees to acquire skills and knowledge that build up their competency (Cooke, 2005). Constructive feedback from periodical performance appraisals transfers knowledge from superiors and peers to employees on a frequent and continuous basis (Fletcher, 2001). Competitive compensation (e.g., a skill-based rather than an egalitarian-based pay system) helps attract and retain high-quality candidates or high performers (Chiu, Luk, & Tang, 2002). In keeping with these ideas, we define human capital-enhancing HR practices to include selective staffing, comprehensive training, developmental performance appraisal, and skill-based compensation.

The main contention of human capital theory (Teo, Le Clerc, & Galang, 2011; Youndt et al., 1996) is that increased employee human capital is likely to lead to higher economic value (i.e., employee productivity) and, ultimately, better firm performance. Numerous studies show that human capital-enhancing HR practices improve employee performance (Teo et al., 2011) and organizational performance (Combs et al., 2006; Jiang et al., 2012b; Subramony, 2009).

### **The Moderating Role of Regional Human Capital Level**

Despite the positive impact of human capital-enhancing HR practices, research suggests that internal and external factors may change the strength of their impact on firm performance. The contingency perspective highlights the fit between HR practices and a firm's internal characteristics and external context (Delery, 1998; Delery & Doty, 1996). Building on this literature, we propose that regional human capital quality may serve as a contingency on the relationship between firm-level human capital-enhancing HR practices and a firm's financial performance. We discuss two possible ways (i.e., substitutive effect vs. complementary effect) in which this contingency may operate. Based on an analysis of HRM development and labor market conditions in China, we argue that the substitutive perspective is more relevant than the complementary perspective in explaining how regional HR quality replaces the effect of firm-level human capital-enhancing HR practices.

*The substitutive effect of regional human capital level.* Past research suggests that firms can enhance collective human capital through internal production and market transactions (Lepak & Snell, 1999). A substitutive effect takes place when both approaches provide similar sets of human capital (Delery, 1998). This means a firm's human capital investment and regional human capital quality have similar effects on the firm's human capital quality, which may, in turn, influence its performance. For example, firms may use HR practices such as training and development to enhance collective human capital. However, when employees have already acquired high-quality KSAs before starting their employment in organizations, the impact of firms' HR practices may be limited. In this case, the high regional human capital quality, representing high-quality individuals in the external labor market, serves as a substitute for firms' HR practices to provide the required human capital.

Previous literature indicates this substitutive relationship. Paauwe and Boselie (2003) argue that employees working in many occupations (e.g., accountants, judges, chefs, and skilled workers) often obtain their work-related KSAs through formal education and training systems rather than via organizational activities. Therefore, in a region with higher levels of human capital quality, firms will find it easier to obtain skilled employees regardless of their own HR investment. In contrast, in a region where qualified employees are rare, firms need to rely on their own HR practices to enhance employees' KSAs within the firms.

*The complementary effect of regional human capital level.* The complementary perspective suggests that HR practices and external labor market work in a synergistic fashion to enhance employees' human capital (Delery, 1998; Jiang, Lepak, Han, Hong, Kim, & Winkler, 2012a). The complementary effect exists when regional human capital quality serves to enhance the impact of human capital-enhancing HR practices. In other words, high levels of regional human capital quality may magnify the impact of firm-level HR practices. For example, in regions with a high human capital quality, selective hiring is likely to yield high-quality employees because firms have a better talent pool to begin with. Similarly, firm-level training, developmental performance appraisals, and skill-based compensation may substantially cultivate employees' human capital, because the employees have a more solid background in terms of general KSAs. Previous research shows that employees with sound general knowledge and skill sets can benefit more from training programs involving customized ingredients such as firm-specific leadership (Solansky, 2010) or information technology application (Levy, 2009).

The complementary perspective is also related to Becker's (1975) categorization of general and firm-specific human capital. General human capital comprises KSAs that can be capitalized on by many organizations, while firm-specific human capital involves KSAs only useful in the focal organization. Researchers have shown that general KSAs set the basis for developing firm-specific KSAs (Ployhart & Moliterno, 2011). HR practices develop firm-specific human capital, while the external labor market provides employees with higher levels of general KSAs. When regional

human capital quality is low, firms may be less likely to build strong human capital due to the weaker general KSAs in the local labor market.

*HR practices in the context of China.* Both perspectives (i.e., substitutive or complementary) may explain when human capital HR practices are more or less likely to affect firm performance. However, we observe that human capital-enhancing HR practices in China tend to focus on enhancing general rather than firm-specific KSAs; thus, the level of general KSAs in a specific region may substitute for the impact of HR practices on firm performance.

Empirical evidence has indicated that, similar to the western contexts, human capital-enhancing HR practices have a positive influence on firm performance in China (see reviews, Liang, Marler, & Cui, 2012; Warner 2008, 2012; Zhao & Du, 2012). However, the evolution of managerial practices in reforming China is ‘in almost continual flux’ as ‘a movable feast’ (Warner, 2008: 779), and many practical features are shaped by the local context (e.g., labor markets) or past practices (e.g., Chinese traditional practices). We explain below why the substitutive perspective is more appropriate.

Reviews on HRM in China (Liang et al., 2012; Warner, 2008) show that extensive investment in training programs has become an important tool to accommodate the unskilled labor conditions in Chinese firms. In particular, researchers pointed out that the primary purposes of training in Chinese firms is to arm employees with basic KSAs required by work tasks (Ng & Siu, 2004) and to enhance ideological and political consciousness through moral education (Zhu, Zhang, & Shen, 2012). As a result, employees are likely to obtain general KSAs that are transferrable among firms. Moreover, Chinese firms tend to take responsibility for training employees for society. Large firms, such as *Huawei*, have established their own corporate universities, where in most cases a group of professors offer guidance and consulting services. The extensive involvement of educational institutions in organizational training programs suggests that training activities are more likely to enhance general human capital; therefore, firm and societal investment in human capital tend to be substitutive.

In addition, other human capital-enhancing HR practices are also likely to enhance general rather than firm-specific human capital. For example, Liang et al. (2012) contend that performance appraisal in China emphasizes individual traits (such as virtue and diligence) as evaluation criteria. It follows that general rather than firm-specific knowledge is likely to be attained by employees from appraisal feedback. In terms of selective staffing, the KSAs of job candidates in a specific industry tend to be homogeneous, because the labor market in China has an oversupply of entry-level employees and a huge shortage of managerial and technical staff (Liang et al., 2012). Accordingly, selective staffing is not very helpful in acquiring specialized talent, whose overall quality is closely related to the local human capital level. In addition, Chinese employees, on average, have a high turnover rate; as Schmidt (2011) noted, they changed their employers every two



to three years, suggesting that the substitution of regional human capital level for HR practices or vice versa may be accelerated through the frequent human capital exchange between organizations.

To summarize, although regional human capital quality can have both substitutive and complementary effects, a substitutive effect is more likely in the Chinese context.

*Hypothesis 1: Firm-level human capital-enhancing HR practices substitute for regional human capital quality, such that the relationship between human capital-enhancing HR practices and firm financial performance will be stronger when regional human capital quality is lower than when it is higher.*

### **The Joint Roles of Regional Human Capital Quality and Product Innovation Strategy**

Human capital theory contends that the extent to which management can add value to firm performance through generating a high-quality workforce depends on the degree to which employees are allowed to contribute their collective KSAs toward organizational performance (Teo et al., 2011). We argue that collective human capital (i.e., through in-house development or buying from the labor market) matters more for firms with a stronger strategic focus on innovation. Product innovation strategy requires firms to respond quickly to rapid market and technological changes due to rapid changes in the standards of products or services (Ding & Akhtar, 2001; Liao, 2005). This means highly skilled employees are more critical for business performance in firms pursuing the innovation strategy (Huang, 2001). Roper, Hewitt-Dundas, & Love (2004) pointed out that, as an evolutionary process, innovation highlighted the application and reapplication of KSAs on a continuous basis, implying that the innovation strategy is likely to require employees to formulate connections between their KSAs and business objectives constantly and offer new solutions or products (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Cooke & Saini, 2010). This means that collective human capital generated by either firm-level HR practices or regional human capital quality will be more relevant when firms adopt an innovation strategy. As a result, the substitutive relationship between HR practices and the regional human capital level is more salient for these firms. Therefore, we develop the following hypothesis:

*Hypothesis 2: Regional human capital quality will have a stronger substitutive effect on the impact of firm-level human capital-enhancing HR practices on a firm's financial performance when a firm adopts an innovation strategy.*

We examined our hypotheses in two studies. We tested Hypothesis 1 (the substitutive effect of regional human capital quality) in Study 1, using the data from the 2005 Investment Climate Survey in China conducted by the World Bank. We tested both Hypotheses 1 and 2 in Study 2, which involved a survey of 203



firms across seven provinces in China. In the following sections, we first describe the measures, samples, analyses, and results of the two studies and then provide a general discussion.

## STUDY 1

### Sample and Procedure

The 2005 Investment Climate Survey in China included both city-level (120 cities) and firm-level data. Two hundred firms were investigated in the four municipalities of Beijing, Tianjin, Shanghai, and Chongqing, whereas 100 firms were investigated in each of the remaining cities of mainland China. The dataset comprised 12,400 firms. After deleting the cases with missing values and outliers, enterprises invested in by Hong Kong, Macau, and Taiwan, and foreign-invested enterprises, we obtained a final sample of 9,125 valid firms across 30 provinces. This survey includes information related to HR practices, as provided by general managers, and that connected to financial performance (e.g., sales performance in 2003 and 2004), as supplied by financial managers. Thus, our independent, dependent, and moderating (based on objective statistics) variables were obtained from three different sources, which means that the results cannot be contaminated by the common method attributable to a single data source (Podsakoff, MacKenzie, & Podsakoff, 2012).

The average firm age was 13.96 years, with average net assets of 98.55 million *yuan*, and 11.51% of firms were state owned. The percentages of chief executive officers (CEOs) who had completed primary school, junior high school, high school, college, graduate, and masters programs or above were 0.36%, 2.83%, 11.45%, 29.97%, 41.35%, and 13.96%, respectively. The average tenure of CEOs was 6.57 years. Approximately 14.20% of the CEOs were appointed by the government. Over 67% of the firms had a board of directors, and over 37% of the CEOs were also the chairmen of the board of directors.

### Measures

*Human capital-enhancing HR practices.* In line with prior literature using the proxy in secondhand or public data (Laurin, Fitzsimons, & Kay, 2011) and conceptualizations on human capital-enhancing HR practices (e.g., Kwon & Rupp, 2013; Youndt et al., 1996), we measured human capital-enhancing HR practices by two HR practices: training and compensation. Training percentage was measured on the basis of the responses to the following question: 'What percentage of the employees received formal training in 2004?' Compensation was assessed by asking whether the firm offered bonuses as a performance award in 2004 (0 = No; 1 = Yes). We standardized the two scores and averaged them into an index of human

capital-enhancing HR practices. *Sales growth* was calculated using the following formula: (sales in 2004 – sales in 2003)/sales in 2003.

*Regional human capital quality.* Following economic studies (Fleisher, Hu, Li, & Kim, 2011; Rosenthal & Strange, 2008), we used the *proportion of highly educated people* and *education investment* to represent the regional human capital quality. Education is the major source of individual human capital before one enters the job market. Education access (e.g., the number of schools) and quality (e.g., the number of higher education institutions) differ from one place to another. Better quality and greater educational opportunities mean more creation and sharing of KSAs within the locality (Inkpen & Pien, 2006; Lam, 1997). Hence, the proportion of highly educated people and education investment can represent the regional human capital quality (Zhang & Zhang, 2012). China's 1978 social and economic reform empowered provincial governments to make full use of their advantages to drive economic development (Sheldon, Kim, Li, & Warner, 2011). An unintended consequence that emerged over the last three decades is the uneven development of human capital across the country (Cooke, 2011; Fleisher, Li, & Zhao, 2010). Heckman (2005) reported that the percentage of the population with a college education or higher varied from 0.79 (in Tibet) to 20.49 (in Beijing) in 2003, suggesting substantial human capital disparities across the provinces in mainland China.

We used two indicators of regional human capital quality: (1) the average number of people with a bachelor degree or above among 100 persons in each province for the years 2002 to 2004; (2) the average local budgetary education investment for each person (unit: 1,000 yuan) from 2002 to 2004. Data for both indices are from the National Bureau of Statistics (2003, 2004, 2005). The average of the standardized scores of these two indicators measures *regional human capital quality*.

*Control variables.* We included a number of control variables due to their potential effects on firm sales growth. We controlled for regional gross domestic product (GDP) (i.e., the average GDP from 2002 to 2004, unit: 1,000 billion yuan). We also controlled for firm age, firm size (log [net fixed assets]), and firm ownership (non-state-owned = 0; state-owned = 1). We further controlled for CEO education (no formal education = 1; primary school = 2; junior high school = 3; high school = 4; college = 5; undergraduate = 6; master or above = 7), CEO tenure, CEO appointment (not appointed by government = 0; appointed by government = 1), board of directors (without board of directors = 0; with board of directors = 1), CEO duality (CEO was not the president of the board of directors = 0; CEO was the president of the board of directors = 1).

## Analysis

Since our data involve two levels (firm and province), we used hierarchical linear modeling (HLM) to control for the potential province-level effects. HLM explicitly

accounts for the correlation structure of data within groups (i.e., provinces) and can estimate the impact of regional-level factors on firm-level outcomes (Bryk & Raudenbush, 1992). We grand-mean centered the firm-level predictors following Hofmann and Gavin's (1998) and Raudenbush's (1989) suggestions. A one-way analysis of variance with random effects showed significant variance across provinces with respect to firm sales growth:  $\tau_{00} = 0.002$ ,  $\chi^2(29) = 67.26$ , and  $p < 0.001$ . The intraclass correlation coefficient, ICC[1], also indicated that the 1.35% variance of firm sales growth could be attributed to the provinces. Therefore, using HLM to test Hypothesis 1 in Study 1 is suitable.

## RESULTS

Table 1 presents the means, standard deviations, and correlations of all variables in Study 1.

Table 2 reports the HLM results in Study 1. Model 2 showed that human capital-enhancing HR practices were positively associated with sales growth ( $\hat{\gamma} = 0.01$ ,  $p < 0.001$ ). Hypothesis 1 was examined in Model 3. The results showed that the interaction between regional human capital quality and human capital-enhancing HR practices has negative effects on sales growth ( $\hat{\gamma} = -0.01$ ,  $p < 0.01$ ). We showed the interaction effect following Aiken and West's method (1991) (using two levels of the moderator: its mean  $+1/-1$  and its standard deviation). As shown in Figure 2, the simple slopes suggest that human capital-enhancing HR practices were more strongly associated with sales growth when the regional human capital level was low ( $\beta = 0.02$ ,  $p < 0.001$ ) than when the regional human capital level was high ( $\beta = 0.01$ , n.s.). That is, regional human capital quality weakened the effect of human capital-enhancing HR practices on sales growth, supporting the substitution effect specified in Hypothesis 1.

## STUDY 2

### Sample and Procedure

Study 2 involves seven cities across mainland China, including Beijing, Shanghai, Guangzhou, Harbin, Wuhan, Chengdu, and Lanzhou. Using local networks, our questionnaires were distributed to the owners of 283 firms in 2007. All firms were privately owned. We received 203 useable responses (71.72% response rate). The 203 firms were evenly distributed across the seven cities: each city had an average of 29 firms. The average firm age is 8.61 years and 66.7% are in the service industry. Forty-two percent of the owners are in the 41–50 age category.

### Measures

*Human capital-enhancing HR practices.* We focus on four general human capital-enhancing HR practices: staffing, training, performance appraisal, and

Table 1. Means, standard deviations, and correlations among variables in Study 1

<i>Variables</i>	<i>Mean</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>
1. Regional GDP	0.63	0.38											
2. Firm age	13.96	14.89	-0.02										
3. Firm size	9.31	2.19	0.07***	0.27***									
4. Firm ownership (1 = SOE)	0.12	0.32	-0.11***	0.47***	0.19***								
5. CEO education	5.51	0.99	-0.07***	0.13***	0.39***	0.13***							
6. CEO tenure	6.57	4.86	0.14***	0.09***	-0.03*	-0.09***	-0.13***						
7. CEO appointment by government	0.14	0.35	-0.07***	0.32***	0.15***	0.45***	0.09***	0.02					
8. Board of directors	0.68	0.47	0.06***	-0.16***	0.25***	-0.33***	0.21***	-0.02*	-0.19***				
9. CEO duality	0.37	0.48	0.09***	-0.09***	0.01	-0.21***	-0.02*	0.19***	-0.08***	0.53***			
10. Human capital-enhancing HR practices	0.00	1.00	-0.05***	0.08***	0.34***	0.07***	0.30***	-0.06***	0.01	0.16***	-0.03*		
11. Regional human capital quality	-0.15	0.63	0.09***	0.01	0.08***	0.01	0.07***	0.01	0.02	0.02*	-0.03**	0.08***	
12. Firm's sales growth	0.24	0.35	0.07***	-0.04***	0.06***	-0.04***	0.02	0.02	-0.05***	0.03**	0.03**	0.05***	-0.02

Notes: N = 9,125; \*p < 0.05, \*\*p < 0.01, and \*\*\*p < 0.001.

Table 2. HLM results predicting firm sales growth in Study1<sup>†</sup>

<i>Variables</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>
Intercept	0.22*** (0.01)	0.21*** (0.01)	0.22*** (0.01)
Regional GDP		0.06*** (0.02)	0.06*** (0.02)
Firm age		-0.00*** (0.00)	-0.00*** (0.00)
Firm size		0.01*** (0.00)	0.01*** (0.00)
Firm ownership		-0.01 (0.01)	-0.01 (0.01)
CEO education		0.00 (0.00)	0.00 (0.00)
CEO tenure		0.00 (0.00)	0.00 (0.00)
CEO appointment		-0.05*** (0.01)	-0.05*** (0.01)
Board of directors		-0.03* (0.01)	-0.03* (0.01)
CEO duality		0.02* (0.01)	0.02* (0.01)
Regional human capital level		-0.02* (0.01)	-0.01 (0.01)
Human capital-enhancing HR practices		0.01*** (0.00)	0.01** (0.00)
Human capital-enhancing HR practices × Regional human capital level (H1)			-0.01** (0.01)
$\sigma^2$	0.12	0.12	0.12
$\tau$ (intercept)	0.002	0.001	0.001
Proportion within-group variance explained <sup>‡</sup>		0.01	0.01
Proportion between-group variance explained <sup>‡</sup>		0.50	0.50
N (Level 1)	9,125	9,125	9,125
N (Level 2)	30	30	30
-2 log-likelihood	6,498.93	6,382.09	6,374.29

*Notes:* <sup>†</sup>The standard errors in the estimations are reported in parentheses.

<sup>‡</sup>The proportion was calculated based on the parameters in Model 1.

\*p < 0.05, \*\*p < 0.01, and \*\*\*p < 0.001.

compensation. Formal recruitment is an average of five formal recruitment sources – valuable outsiders, advertisement, company recruitment session, school recruitment, and external agency – measured on a five-point scale (1 = ‘not at all or very little’ to 5 = ‘very extensive’). The selection method was a combination of seven dichotomous formal selection tools: application form, personality test, interview, skills test, simulation, reference check, and medical examination. The selection criteria were assessed by four items: current skills, academic qualification, long-term potential, and past achievements (1 = ‘least important’ to 5 = ‘most important’). Training and development provision was measured by two items: training available to employees and development opportunities provided to employees (1 = ‘not at

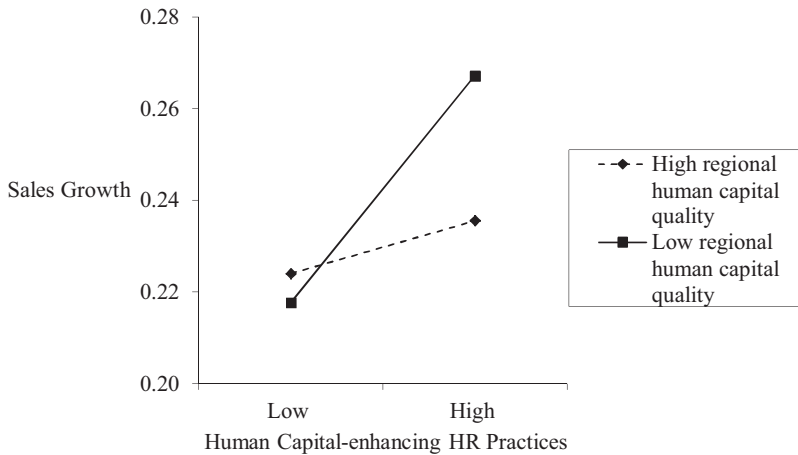


Figure 2. Effects of the interaction between regional human capital quality and human capital-enhancing HR practices on sales growth in Study 1

all' to 5 = 'extensively used';  $\alpha = 0.81$ ). Training techniques were assessed on the basis of the following six items: on-the-job training, job instruction, one-to-one training, off-the-job lectures, video training, and work simulation (1 = 'not at all' to 5 = 'extensively used'). Development techniques were assessed by three items: job rotation, action learning, and off-the-job seminars (1 = 'not at all' to 5 = 'extensively used'). The purpose of conducting performance appraisals was determined by six items: assess past performance, reward allocation, identify future R&D needs, discover employee potential, provide feedback, and evaluate the overall effectiveness of the company (1 = 'not at all' to 5 = 'extensively used';  $\alpha = 0.79$ ). Compensation was an average of seven formal variable schemes designed to motivate and retain employees, including performance-based pay, commission, annual bonus, piecework salary, superannuation, medical allowance and training, and development budgets. (1 = 'not at all' to 5 = 'extensively used'). Following most HRM empirical studies (e.g., Batt & Colvin, 2011; Teo et al., 2011), we standardized the scores of each HRM area and averaged them into a single index.

*Firm financial performance.* We measured firm financial performance using a five-item scale (Eddleston, Kellermanns, & Sarathy, 2008). Each respondent (CEO) was asked to compare their firm's financial performance with that of their competitors over the last three years. Two illustrative items for this comparison were 'growth in sale' and 'growth in market share' (1 = 'much lower than industry average' to 5 = 'much higher than industry average';  $\alpha = 0.83$ ).

*Product innovation strategy.* We assessed firms' product innovation strategies with a five-item scale (Zahra & Covin, 1993). Sample items included 'increase the rate of new product introductions to the market' and 'develop a large variety of new product lines' (1 = 'strongly disagree' to 5 = 'strongly agree';  $\alpha = 0.81$ ).

*Regional human capital quality.* Regional human capital level was measured using the same methods as those employed in Study 1, except we used the average of the associated statistics from 2005 to 2007 (National Bureau of Statistics, 2006, 2007, 2008).

*Control variables.* We included the following variables to control for their potential effects on firm financial performance: regional gross domestic product (GDP) (i.e., the average GDP from 2005 to 2007, unit: 1, 000 billion yuan), firm industry (manufacturing = 1; service = 0), firm age (years of operation), firm size (log [number of employees]), CEO's age and education (junior high school or under = 1; high school = 2; secondary technical school = 3; diploma = 4; undergraduate degree = 5; graduate degree = 6). CEO ages were grouped into three categories (not older than 40; older than 40, but younger than 50; equal to or older than 50).

## Analysis

Similar to Study 1, we first ran a one-way analysis of variance with random effects. This 'null model' suggested a nonsignificant variance across provinces with regard to firm financial performance:  $\tau_{00} = 0.00$ ,  $\chi^2(6) = 0.04$ , n.s. The ICC[1] also indicated that less than 6% variance of firm financial performance came from the provinces. Since our data are nested in provinces, HLM was used to test our hypotheses.

## RESULTS

We conducted the confirmative factor analysis to ensure that the two studied variables (innovation strategy and firm financial performance) were distinct. The two-factor measurement model provided better fit to the data ( $\chi^2 = 95.81$ ,  $df = 34$ ,  $p < 0.001$ ; RMR = 0.04, RMSEA = 0.08, CFI = 0.91, GFI = 0.91), compared to the single-factor model ( $\chi^2 = 273.76$ ,  $df = 35$ ,  $p < 0.001$ ; RMR = 0.08, RMSEA = 0.18, CFI = 0.65, GFI = 0.73;  $\Delta\chi^2 = 177.95$ ,  $\Delta df = 1$ ,  $p < 0.001$ ). Table 3 presents the means, standard deviations, and correlations of all the variables in Study 2.

Table 4 reports HLM results. Model 2 indicated that firm-level human capital-enhancing HR practices were positively associated with firm performance ( $\hat{\gamma} = 0.12$ ,  $p < 0.05$ ). Hypothesis 1 was examined in Model 3, which showed that regional human capital quality significantly moderated the relationship between human capital-enhancing HR practices and firm performance ( $\hat{\gamma} = -0.07$ ,  $p < 0.05$ ). When the regional human capital quality was lower, the relationship between human capital-enhancing HR practices and firm performance was stronger. As Figure 3 illustrates, the simple slopes suggest that human capital-enhancing HR practices were positively associated with firm performance when regional human capital quality was low ( $\beta = 0.24$ ,  $p < 0.001$ ) but not when regional human capital quality was high ( $\beta = 0.03$ , n.s.). Thus, Hypothesis 1 was supported.



Table 3. Means, standard deviations, and correlations among variables in Study 2

<i>Variables</i>	<i>Mean</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>
1. Regional GDP	3.52	2.70										
2. Industry	0.31	0.46	-0.09									
3. Firm age	8.61	5.44	-0.15*	0.18*								
4. Firm size	3.81	1.33	-0.19**	0.41***	0.26***							
5. CEO age 1 (age ≤ 40)	0.33	0.47	-0.05	-0.16*	-0.21**	-0.13						
6. CEO age 2 (age > 40)	0.42	0.49	-0.16*	0.25***	0.23**	0.18**	-0.60***					
7. CEO education	4.37	1.24	0.09	-0.09	-0.09	0.15*	0.08	0.04				
8. Human capital-enhancing HR practices	0.00	1.00	0.17*	-0.11	-0.05	0.08	-0.10	-0.08	0.13			
9. Regional human capital quality	0.63	1.55	-0.61***	-0.03	-0.04	0.06	0.29***	-0.03	0.01	-0.14*		
10. Product innovation strategy	3.81	0.67	-0.06	-0.05	0.03	0.12	0.02	0.08	0.15*	0.38***	-0.01	
11. Firm financial performance	3.60	0.70	0.00	-0.02	0.12	0.10	-0.06	0.04	-0.09	0.27***	0.05	0.32***

Notes: N = 203, \*p < 0.05, \*\*p < 0.01, and \*\*\*p < 0.001.

Table 4. HLM results predicting firm financial performance in Study 2<sup>†</sup>

<i>Variables</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
Intercept	3.60*** (0.05)	3.47*** (0.14)	3.43*** (0.14)	3.38*** (0.13)
Regional GDP		0.03 (0.02)	0.03 (0.02)	0.04 (0.02)
Industry		-0.07 (0.11)	-0.08 (0.11)	-0.08 (0.10)
Firm age		0.01 (0.01)	0.02 (0.01)	0.01 (0.01)
Firm size		0.04 (0.04)	0.03 (0.04)	0.02 (0.04)
CEO age 1 (age < = 40)		-0.07 (0.13)	-0.03 (0.13)	-0.14 (0.12)
CEO age 2 (age > 40)		0.02 (0.12)	0.06 (0.12)	-0.00 (0.11)
CEO education		-0.10* (0.04)	-0.10* (0.04)	-0.07 (0.04)
Regional human capital quality		0.08* (0.04)	0.08* (0.04)	0.10** (0.04)
Product innovation strategy		0.29*** (0.07)	0.29*** (0.07)	0.30*** (0.08)
Human capital-enhancing HR practices		0.12* (0.05)	0.18** (0.06)	0.20*** (0.05)
Human capital-enhancing HR practices × Regional human capital level (H1)			-0.07* (0.03)	-0.07* (0.03)
Human capital-enhancing HR practices × Product innovation strategy				0.43*** (0.08)
Regional human capital level × Product innovation strategy				-0.02 (0.04)
Human capital-enhancing HR practices × Regional human capital level × Product innovation strategy (H2)				-0.10* (0.05)
$\sigma^2$	0.48	0.39	0.38	0.33
$\tau$ (intercept)	0.00	0.00	0.00	0.00
Proportion within-group variance explained <sup>‡</sup>		0.19	0.21	0.31
Proportion between-group variance explained <sup>‡</sup>		1.00	1.00	1.00
N (Level 1)	203	203	203	203
N (Level 2)	7	7	7	7
-2 log-likelihood	427.96	386.25	381.10	353.37

Notes: <sup>†</sup>The standard errors in the estimations are reported in parentheses.

<sup>‡</sup>The proportion was calculated based on the parameters in Model 1.

\*p < 0.05, \*\*p < 0.01, and \*\*\*p < 0.001.

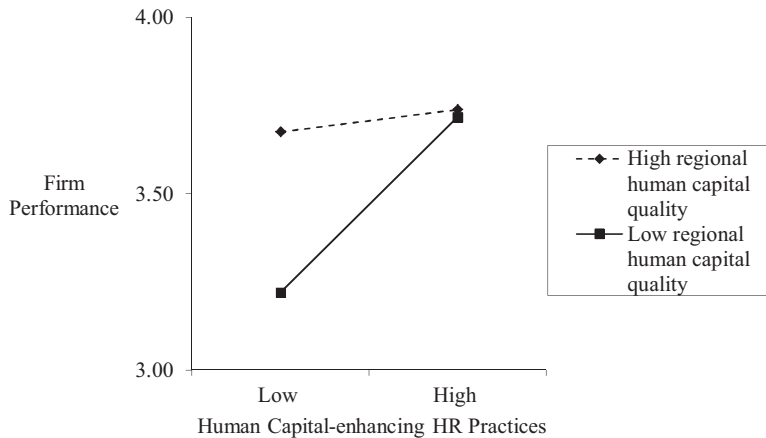


Figure 3. Effects of the interaction between regional human capital quality and human capital-enhancing HR practices on firm performance in Study 2

Hypothesis 2 proposes that the moderating effect of regional human capital quality on the relationship between human capital-enhancing HR practices and firm performance will be stronger when a firm adopts a product innovation strategy. As reported in Model 4, the three-way interaction was significant ( $\hat{\gamma} = -0.10, p < 0.05$ ). To further interpret the results, we plotted the three-way interaction (Figure 4). Consistent with Hypothesis 2, when regional human capital quality was low and product innovation strategy was high, the slope of the effect of human capital-enhancing HR practices on firm performance was positive and was steepest among the four lines. We further statistically compared the four slopes to zero. Simple slope analyses indicated that the relationship between human capital-enhancing HR practices and firm performance was positive and significantly different from zero when the regional human capital level was low and the product innovation strategy was high ( $\beta = 0.62, p < 0.001$ ). This relationship was not significant for the other three simple slopes ( $\beta = 0.19, n.s.$ , for high regional human capital quality and high production innovation strategy;  $\beta = -0.08, n.s.$ , for high regional human capital quality and low production innovation strategy;  $\beta = -0.08, n.s.$ , for low regional human capital quality and low production innovation strategy). Additionally, the slope difference test, as proposed by Dawson and Richter (2006), indicated that the slope for the relationship between human capital-enhancing HR practices and firm performance when the regional human capital quality was low and with the product innovation strategy was significantly different from the other three slopes. Thus, Hypothesis 2 was supported.

## DISCUSSION

This article examined contingencies in the relationship between human capital-enhancing HR practices and firm performance in two studies. Using an archival dataset of 9,125 firms across 30 provinces in China, Study 1 supported the first

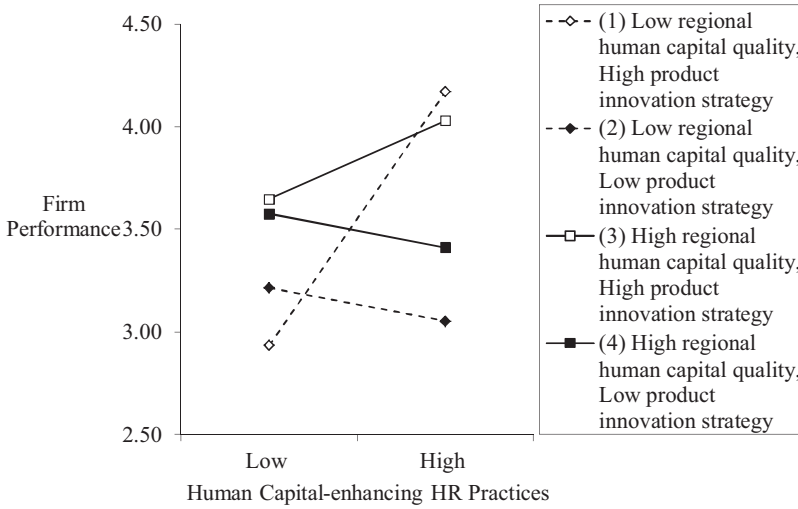


Figure 4. Effects of the interaction between regional human capital quality, product innovation strategy, and human capital-enhancing HR practices on firm performance in Study 2

*Slope difference tests:*

Between group (1) and group (2)	4.56***
Between group (1) and group (3)	2.85**
Between group (1) and group (4)	4.99***
Between group (2) and group (3)	-1.94
Between group (2) and group (4)	0.01
Between group (3) and group (4)	1.84

\*\*p < 0.01, and \*\*\*p < 0.001.

hypothesis that the positive relationship between human capital-enhancing HR practices and sales growth was stronger when the quality of regional human capital was low. Study 2, using a survey of 203 Chinese firms across seven provinces, supported both hypotheses. In addition to replicating the substitution effect of regional human capital quality, we found that when a firm adopted an innovation strategy, the aforementioned moderating effect was stronger. Firms’ human capital-enhancing HR practices were most effective in improving their performance when the regional human capital level was low and when they adopted a product innovation strategy (Hypothesis 2).

**Theoretical Implications**

These findings make several important contributions to the current understanding of the HRM-performance relationship from a contingency perspective. First, the moderating role of regional human capital quality extends our knowledge of the boundary conditions of HRM effectiveness. By analyzing traditional HRM practices (i.e., training practices that focus on general skills) and the labor market

(i.e., high labor mobility) in contemporary China, we hypothesized and found that the regional human capital level substituted for, rather than complemented, human capital-enhancing HR practices to promote firm performance. These findings confirm that HR practices in China tend to develop general rather than firm-specific human capital. Specifically, in regions with high human capital quality, where the workforce is highly educated and governmental investment in education is sufficient, employees gain similar sets of KSAs from regional resources and organizational investment. Past empirical research conducted in developed economies paid little attention to the regional settings of organizations; instead, most studies focused on organizational and industrial contingencies (Datta et al., 2005; Youndt et al., 1996). Future research should explore the influences of other institutional arrangements on the HRM-performance relationship.

Our analysis implies that the influence of regional human capital quality is context specific, suggesting that a buying approach to high-quality human capital attainment appears to be a viable strategy in China in regions with high investment in human capital. Consequently, firm-level human capital-enhancing HR practices would be more important in provinces with a less-educated workforce. However, whether this finding is relevant in other contexts (e.g., developed or other developing countries) needs further investigation. Compared to developed countries, China's governmental investment in education is relatively low at a country level (Heckman, 2005). Its labor market development is still immature, with an unbalanced labor supply and demand. HRM in China is also affected by its people-management legacies. All these factors contribute to the substitutive rather than complementary effect of regional human capital quality. In developed countries, sophisticated HRM practices tend to generate firm-specific KSAs. It follows that high regional human capital quality and firm HR practices may complement each other to improve the quality of the collective human capital in organizations. Future research may test the relationship between human capital-enhancing HR practices and regional/national human capital levels in other contexts.

Our study deepens our understanding of how the fit among regional settings, business strategies, and management practices predicts firm performance by finding that the substituting effect of regional human capital quality was highest when the firm adopted a product innovation strategy. This indicates additional insight by considering the joint influences of both the external environment condition (regional human capital quality) and the internal firm requirement (innovation strategy) in assessing the effect of HR practices on firm performance. Schuler and Jackson (1987) and Huang (2001) indicated that a product innovation strategy relied on skilled and creative employees to respond to the environment in an adaptive and creative manner. Future research may extend this study by examining the contingent roles of regional human capital quality when firms engage in firm-specific investment in human capital. The effect may be complementary rather than substitutive under such an arrangement.

### **Limitations and Future Research Directions**

This research has several limitations. First, the research design of both studies was cross sectional. The causality of the observed relationships cannot be confirmed. Future research will require a longitudinal design to clarify causality. Second, common method variance is a potential limitation of Study 2. In Study 2, we used a single respondent to describe the company's HR practices, strategy, and performance, making it impossible to determine the reliability of the responses. However, the interaction effects are less affected by common method (Evans, 1985; Podsakoff et al., 2012; Siemsen, Roth, & Oliveira, 2010). Through statistical analyses, Siemsen et al. (2010: 470) emphasized that 'finding significant interaction effects despite the influence of CMV in the data set should be taken as strong evidence that an interaction effect exists'. Despite this limitation, the results corroborate the findings of Study 1, which involved different raters for different measures. Third, the measures of human capital-enhancing HR practices were different in the two studies. However, the results are similar, attesting to the robustness of the findings even when different measures are used.

A fourth limitation is the selection of only two contingencies in our design. Other organizational and social factors, such as organizational structure and labor mobility and shortage in a region, may also influence HRM effectiveness. Future research may explore other potential moderators and thus expand our knowledge of the strategic HRM contingency. Moreover, we assumed collective human capital is a mediator between HR practices and firm performance; however, we did not directly measure this variable in both studies. Future research may consider examining a moderated mediation model by including organizational collective human capital quality as a mediator. Finally, our theory and samples are based on the Chinese context. Future research should investigate the applicability of our findings about regional human capital factors to a larger coverage, such as multinational enterprises operating across multiple national boundaries.

### **Practical Implications**

These findings have several practical implications. First, it is vital to recognize the importance of regional human capital quality. Firms in underdeveloped areas in China may benefit more from human capital investments by the regional government or additional investment by the firm to raise the quality of the labor force hired into the firm. This firm-level investment is particularly important for firms pursuing the product innovation strategy. Firm-level investment may have substantial payoff for innovation in regions with overall poor quality in human capital. Firms operating in different regions may need to balance the expectations of HRM investment with local conditions. The same human capital investment in different regions with unequal regional human capital quality may not be an optimal solution for firms' overall performance. Firms that operate in different regions need

to consider the costs and benefits of consistent or localized HRM policies. Finally, our findings also have implications for regional policymakers. For instance, more attention should be paid to the access to and quality of the regional education and vocation training systems. Investment in education and training by local institutions providing general KSAs to employees should be useful to most firms.

## CONCLUSION

Using two different samples, our study shows that organizational human capital investment and regional human capital quality substitute for each other in enhancing business performance in China. Moreover, the substitutive effect is more relevant for firms adopting an innovation strategy, suggesting that, to achieve high business outcomes, firms need to consider their internal management, business strategies, and important operating contexts together. We hope this study has advanced our knowledge about the contingencies of strategic HR management and offered directions for future research in both developed and developing contexts.

## SUPPLEMENTARY MATERIAL

To view supplementary material for this article, please visit <http://dx.doi.org/10.1017/mor.2015.12>

## NOTE

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