

## A RESOURCE-BASED PERSPECTIVE ON HUMAN CAPITAL LOSSES, HRM INVESTMENTS, AND ORGANIZATIONAL PERFORMANCE

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*Reversing the focus on human capital accumulations in the resource-based literature, the authors examine the issue of human capital losses and organizational performance. They theorize that human capital losses markedly diminish the inimitability of human capital stores initially, but that the negative effects are attenuated as human capital losses increase. They argue further that these effects are more dramatic when human resource management (HRM) investments are substantial. As predicted, Study 1 shows that the human capital losses (voluntary turnover rates)-workforce performance relationship takes the form of an attenuated negative relationship when HRM investments are high. Study 2 shows stronger curvilinear effects of voluntary turnover rates on financial performance via workforce productivity under these conditions. Implications for resource-based theory and strategic HRM are addressed. Copyright © 2012 John Wiley & Sons, Ltd.*

### INTRODUCTION

The notion that sustained competitive advantage of organizations can be driven by the accumulation of high quality human resources is pervasive in the literature (e.g., Coff, 1997, 2002; Coff and Kryscynski, 2011; Ployhart, Weekley, and Baughman, 2006; Prahalad, 1983). The focus on human capital as a source of competitive advantage has intensified the need for organizations not only to understand and win the talent war (Gardner, 2005) but also has led to a tighter integration of the

fields of strategic management and strategic human resource management (HRM) often through the lens of the resource-based view (RBV) (e.g., Barney, 1991; Wernerfelt, 1984). The RBV has shifted the focus of strategic management literature on sources of competitive advantage from external factors, such as industry position, to idiosyncratic internal factors, such as human capital accumulations (e.g., Hoskisson *et al.*, 1999). Human resources can be viewed as potentially valuable, rare, and non-substitutable resources because they are scarce, specialized, and hold tacit knowledge (Coff, 1997). Thus, imitating human capital accumulations is challenging because it is difficult to identify the precise aspect of the advantage and to replicate how it was assembled.

Strategic HRM researchers suggest that investments in HRM practices enhance the key elements of sustained advantage found in the RBV.

**Keywords:** resource-based view; human capital; strategic human resource management; organizational performance; turnover

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Organizations can use training, sophisticated selection, financial incentives, and other practices to increase the value, rareness, non-substitutability, and inimitability of the human capital pool. In high investment organizations, HRM practices are used as tools for building a workforce that creates competitive advantage (Delery and Shaw, 2001). In contrast, in low investment organizations, HRM practices do little to develop long-term human capital; the organization treats the workforce as a commodity and gives individuals little opportunity or ability to create sustained competitive advantage. Instead, such organizations pursue advantage via means such as superior technology, finances, or physical resources (Delery and Shaw, 2001).

The literature clearly shows that human capital accumulations and HRM investments can substantially and positively affect organizational performance (e.g., Hitt *et al.*, 2001) but the literature offers less theoretical and empirical guidance showing how human capital losses (resource depletion) can negatively influence organizational performance. In essence, RBV researchers have emphasized the accumulation of human capital as a source of competitive advantage but have tended to ignore the risks of resource accumulation efforts. It is reasonable, then, to question whether the performance related advantages associated with building human capital accumulations are symmetric to the performance related disadvantages of losing human capital. Discussing the findings of their exhaustive quantitative review of the human capital and performance literature, Crook *et al.* (2011: 452) suggested that understanding the point at which, and conditions under which, 'human capital begins to diminish and lose its value' is a critical direction for strategy research.

Rectifying the imbalance in the literature is important for two key reasons. First, unlike other organizational resources, employees can leave (Coff, 1997). Turnover not only depletes accumulated human capital, it also offers rival organizations opportunities to appropriate knowledge. Furthermore, with most other investments (e.g., the development of an idiosyncratic manufacturing process), organizations can reasonably estimate the investment's life span. But human capital is essentially beyond the organization's control, so unexpected losses or depletions forfeit potential returns on investments, placing decision makers in a dilemma about whether to invest (Coff, 1997). Second, when accumulated human capital is

depleted, workers must be replaced, which costs organizations not only money but also starts a 'period of dynamic adjustment costs while the best uses of the human capital are discovered and tailored to the needs of the new environment' (Hatch and Dyer, 2004: 1156; Lepak and Shaw, 2008). As such, we need to better understand how human capital losses relate to organizational performance under differing levels of HRM investments.

We develop a resource-based perspective on the losses of accumulated human capital and describe theoretically how these losses relate to dimensions of performance for organizations pursuing different HRM approaches. We buttress our resource-based arguments with perspectives on human capital losses from the sociological (e.g., Price, 1977) and human capital literature (e.g., Coff, 1997; Hitt *et al.*, 2001). We propose that, for firms with high HRM investments, increasing the potential inimitability of human capital pools means more damage to organizational performance when initial human capital losses occur; in essence, organizations 'walk a fine line' in such circumstances (Guthrie, 2001).

In planning this research, we decided first to focus on voluntary turnover or quit rates, a key marker of human capital losses or depletion (Bontis and Fitz-enz, 2002; Shaw, 2011). Second, we defined organizational performance in two ways—as intermediate dimensions of workforce performance (productivity and accident rates) and as distal financial performance (return on assets [ROA] and profit) (Ployhart, Weekly, and Ramsey, 2009). In Study 1, data constraints limit our study to workforce performance outcomes, but in Study 2, we extend our model to financial performance. Third, we follow prior researchers and view HRM investments as a substitutable set of practices that contribute directly and indirectly to human capital accumulations (e.g., Delery and Shaw, 2001). Fourth, we limit our examination to core, full-time employees because full-time employee groups are central to the human capital accumulation and depletion arguments we use here. Fifth, we tested our model in two divergent contexts as a check on the robustness of our model across contexts. Study 1 includes a sample of small supermarkets where human capital is likely to be of less strategic importance and where HRM investments, in general, are modest. Thus, Study 1 represents a conservative test of the underlying, theoretical issues. In Study 2, we put

an extended theoretical model to the test in a cross-industry sample of organizations in Korea, where countrywide investments in human capital have produced a highly skilled, high quality workforce (Bae and Rowley, 2004).

## BACKGROUND AND THEORY

The resource-based perspective (Barney, 1991; Wernerfelt, 1984) focuses on the value, rareness, non-substitutability, and inimitability of organizational resources, including people. Strategic management and strategic HRM researchers have long recognized that employees play strong roles in developing and maintaining a company's competitive edge over rivals (Delery and Shaw, 2001). In line with these arguments, recent meta-analytic evidence shows significant and practically relevant positive associations between human capital accumulations and dimensions of firm performance (Crook *et al.*, 2011). When human capital accumulations are high, a company is likely to profit from firm-specific skills, knowledge, and abilities to sustain competitive advantage. Moreover, Hitt *et al.* (2001) and Coff (1997), among others, acknowledged that such human capital accumulations are potentially most valuable when they are retained where they were developed. In resource-based theorizing, the prior history associated with an organization's resources—path dependence—is a key factor in establishing the resource inimitability. In the aggregate, accumulated skills, knowledge, and abilities found in low voluntary turnover situations should be associated with strong workforce performance, partly because competitors cannot easily and quickly replicate the stock of capital (Ployhart *et al.*, 2009; Ployhart, Van Iddekinge, and MacKenzie, 2011). For competitors, 'trying to quickly build human capital is unlikely to reproduce the same value it has for units in which the capital has been established for a long time' (Ployhart *et al.*, 2009: 1000) because of these time-compression diseconomies (see also Dierickx and Cool, 1989). But, as human capital accumulations are depleted through voluntary turnover, the path dependencies and social complexities associated with the long-tenured workforce are erased; competitors can then more easily imitate the remaining resources and eliminate any competitive advantages.

This resource-based reasoning is consistent with Price's (1977) theorizing from a sociological viewpoint. He argued that high human capital accumulations enhance organizational performance, but as human capital depletion moves beyond low-to-moderate levels, the negative effects would dissipate such that 'successively higher amounts of turnover will be found ultimately to produce, more often than not, *successively lower amounts of effectiveness at a decreasing rate*' (Price, 1977: 119). He also suggested that when human capital losses reach high levels, the organization's workforce is distracted from task accomplishment and is focused primarily on constantly replacing lower quality human capital. As Shaw, Gupta, and Delery (2005: 52) pointed out, 'when the workforce is being constantly replaced (for example, the turnover rate is 100 percent), marginal increases in voluntary turnover (such as to 110 percent) are proportionally less problematic in terms of productivity and safety than increases at lower average turnover rates (e.g., from 10 to 20 percent)' (see also, Price, 1977).

Combined, the RBV and Price's (1977) model yield a particular theoretical form of the relationship between human capital losses and organizational performance. The RBV suggests that as depletion increases—as voluntary turnover rates move from low to moderate levels—the organization will lose its inimitable source of advantage, and performance should decline precipitously. As human capital depletions increase—as voluntary turnover rates move from moderate to high levels—the relationship should be attenuated. Shaw, Gupta, and Delery (2005) found support for this effect in two intra-industry studies; they found that voluntary turnover and workforce performance dimensions (productivity and accident rates) had a strong negative relationship initially, but were attenuated at higher voluntary turnover rates. Note that several recent studies have reported robust negative linear relationships between human capital losses (turnover rates) and workforce performance measures (e.g., Kacmar *et al.*, 2006), but have failed to report tests for curvilinearity. Because our RBV derivation implies an attenuated negative relationship rather than a U-shaped relationship, we would expect a negative relationship in the absence of curvilinear tests. Indeed, such linear relationships are observed in Shaw, Gupta, and Delery (2005) and elsewhere.

### The role of HRM investments

Resource-based arguments can be used to describe HRM investments' role in increasing the workforces' value and rareness and, by extension, making human capital losses more damaging to organizational performance (Arthur, 1994; Guthrie, 2001). HRM investments—especially those practices such as pay, benefits, and procedural justice that induce retention (Shaw *et al.*, 1998)—increase human capital accumulations and workforce interconnections (Dess and Shaw, 2001). The RBV suggests that employees are more valuable when they are interconnected and embedded in socially complex interactions (Coff, 1997). On the one hand, HRM investments such as training and justice mechanisms encourage open communication and the development of social relationships; investments such as high pay and benefits encourage longevity, which serve to increase connectedness, social complexity, and co-specialization of resources among employees. HRM investments can, thus, render the resulting resources more rare, valuable, and inimitable (Ployhart *et al.*, 2009). On the other hand, HRM investments increase the costs of human capital depletion by exacerbating the value of firm-specific human capital losses, by creating damaging gaps in communication networks, and by hampering co-specialization. The worst of these losses should occur when turnover rates increase from very low to moderate levels (Shaw, Duffy, Johnson, and Lockhart, 2005). Buttressing the RBV arguments, Arthur (1994) further argued that in organizations that invest substantially in HRM, employees play more central roles in organizational performance. Their increased centrality means that they are expected to contribute more and often have tasks that demand more experience and longer tenure. Organizations that invest little in HRM, instead seek competitive advantage through, for example, cost reductions or technology enhancements (Osterman, 1987).

In their parallel tests of alternative theories, Shaw, Gupta, and Delery. (2005) found support for the HRM investments interaction prediction. But a close analysis of their results shows that because these authors found support for the attenuated negative perspective, the interaction of the linear human capital loss construct (*viz.*, voluntary turnover) and HRM investments may not have been evident in their tests because

they had established a curvilinear shape for the voluntary turnover relationship with performance dimensions. Given an established curvilinear effect in their data, essentially they failed to fully specify the form of the interaction that would support RBV reasoning. When HRM investments are high, human capital depletion should substantially and negatively affect performance. Moreover, these negative effects should be most apparent as human capital depletions first begin to occur. At higher depletion levels (*i.e.*, moderate to high voluntary turnover rates), the rarest, most valuable, non-substitutable, and inimitable capital accumulations have been depleted, and replacement workers can quickly reach the performance levels of departing employees. In contrast, when organizations invest little in HRM, human capital depletions should not significantly relate to workforce performance (Arthur, 1994; Guthrie, 2001). Thus, we offer the following hypotheses:

*Hypothesis 1: The relationship between human capital losses (voluntary turnover rates) and workforce performance will be curvilinear such that the relationship will be generally negative, but will be attenuated as voluntary turnover rates rise (an attenuated negative relationship).*

*Hypothesis 2: The relationship between human capital losses (voluntary turnover rates) and workforce performance will be moderated by HRM investments such that the voluntary turnover rates–workforce performance relationship will be an attenuated negative form when HRM investments are high, but the relationship will be nonsignificant when HRM investments are low.*

### STUDY 1: METHOD

We collected data from single-unit supermarkets in the United States. We randomly selected 1,000 stores from the single-unit supermarket edition of the *Chain Store Guide*. We sent all store managers a letter encouraging them to participate in our study, telephoned them, and then mailed them a survey. Six weeks later, we sent reminder letters to nonrespondents. Completed questionnaires



were returned from 320 supermarkets (response rate = 32%). The questionnaire data were merged with store sales data from the *Chain Store Guide*. Following other researchers (e.g., Shaw, Gupta, and Delery, 2001; 2002) we focused on two measures of workforce performance—workforce productivity and accident rates. A one-year lag occurred between the questionnaire data collection and the version of the *Chain Store Guide* used to obtain store sales data. The *Chain Store Guide* is available only annually, so a one-year lag was used to separate the key predictors and outcomes in time, a design that is consistent with our underlying causal reasoning. Missing data reduced the analysis samples to 243 in the workforce-productivity equations and 273 in the accident-rate equations. All variables used for the analyses (i.e., control variables, HRM investments measures, and voluntary turnover rates) were specific to the full-time employee populations.

## Measures

### *Human capital losses (voluntary turnover rates)*

This variable was operationalized as the natural log of the number of full-time employees who had quit in the past year divided by the total number of full-time employees as reported by store managers.

### *HRM investments*

Following Shaw, Gupta, and Delery (2005), this variable was assessed as an additive index of direct and indirect HRM investments—training, pay level, benefit level, job security, procedural justice, and selective staffing. We assumed that scores on each practice caused the composite level; our operationalization is a formative measure (Law, Wong, and Mobley, 1998). *Pay level* was the hourly pay rate for full-time employees. *Benefits level* was the percent of full-time employee health insurance premiums paid by the company. *Training* was the total hours of training that a typical full-time employee received each year. *Job security* was measured with the two-item measure from Shaw *et al.* (1998) ('We have systems in place to guarantee work for our employees'; 'We guarantee employees a certain amount of work in every pay period'). The items had seven Likert-type response options ( $\alpha = 0.70$ ). *Procedural justice* was measured with five items adapted from Colquitt (2001) ( $\alpha = 0.84$ ) with five

response options from 1 (*not at all*) to 5 (*to a very great extent*). A sample item: 'To what extent are employees able to express their views before decisions are made?' *Selective staffing* was assessed with the average of five items adapted from Shaw and colleagues (1998). Informants reported how extensively they used structured interviews, physical ability tests, reference checks, drug testing, and background checks when hiring employees. The items had five response options from 1 (*not at all*) to 5 (*to a very great extent*). Each HRM practice measure was standardized before the z-scores were averaged.

### *Workforce performance*

*Workforce productivity* was operationalized as the natural log of sales per employee, that is, total store sales divided by total (full-time equivalent) employees. The *Chain Store Guide* provided sales information for the year following the questionnaire data collection (a one-year lag). *Accident rates* was operationalized as the number of employee accidents in the past year divided by total employees, as reported in the questionnaire. The distribution of accident rates was not skewed so the raw ratio was used in the analyses.

### *Controls*

Because they are related to voluntary turnover, HRM investments, and performance, we controlled for *organizational size* (Shaw *et al.*, 1998), *unionization* (Arthur, 1994), *discharge rate* (Guthrie and Datta, 2008), and the use of *part-time employees* (Siebert and Zubanov, 2009). *Organization size* was the store's total square footage, from the *Chain Store Guide*. *Discharge rate* was the number of full-time employees discharged or fired divided by the total number of full-time employees. The number of part-time employees divided by the total number of employees as reported in the questionnaire was operationalized as the percent of part-time employees.

## STUDY 1: RESULTS

### *Response bias check*

We used data from the *Chain Store Guide* and logistic regressions to compare the characteristics of responding and nonresponding organizations.

We compared characteristics of nonresponders (coded 0) with those of the 320 responding organizations (coded 1) across three variables that were available in the *Guide*—store age, store sales, and total square feet. None of the independent variables was a significant predictor in this equation. These tests suggest that response bias or selection effects are unlikely to be problematic in our tests.

### Regression results

Table 1 shows the descriptive statistics for, and correlations among, all study variables in Study 1. Table 2 shows the regression analyses.

#### Workforce productivity

As the left side of Table 2 shows, neither voluntary turnover rates ( $b = -0.10$ , n.s.) nor HRM investments were significant predictors ( $b = -0.04$ , n.s.) in Model 2. In Model 3, the quadratic voluntary turnover rates term was significant ( $b = 0.55$ ,  $p < 0.05$ ), explaining an additional two percent of the variance in workforce productivity. A plot of the relationship shows that the relationship was initially strong, but weakened as voluntary turnover rates increased with a zero-slope point of approximately 2.3 standard deviations above the mean. Thus, Hypothesis 1 was supported.

Testing the moderation of a curvilinear effect is akin to testing a three-way interaction. That is, all possible combinations of the component variables should be included in the model that includes the curvilinear interaction—for example, voluntary turnover rates, voluntary turnover rates squared, the product of voluntary turnover rates (linear) and HRM investments, and the product of voluntary turnover rates squared and HRM investments. Support is found if the curvilinear interaction explains significant variance above the component terms and their products and if the plotted form of the interaction conforms to the prediction. In Model 5, the interaction of the quadratic voluntary turnover rates term and HRM investments was significant ( $b = 1.50$ ,  $p < 0.01$ ) and explained an additional three percent of the variance in workforce productivity. As shown in Figure 1, when HRM investments were high, the relationship between voluntary turnover rates and workforce productivity was attenuated negative in shape, but the relationship between voluntary turnover rates and workforce productivity was

Table 1. Study 1: Descriptive statistics and correlations

	Mean	SD	1	2	3	4	5	6	7
1. Organization size	9.33	1.01							
2. Unionization	0.05	0.21	0.13*						
3. Discharge rate	0.04	0.16	-0.13*	-0.03					
4. Percent part time employees	0.57	0.17	0.08	0.04	-0.17**				
5. Voluntary turnover rates	0.18	0.25	0	-0.10	0.17**	-0.18*			
6. HRM investments	-0.00	0.51	0.15*	0.19**	-0.05	0.07	-0.20**		
7. Workforce productivity	11.99	0.46	0.06	0.11*	-0.11*	0.12*	-0.05	-0.01	
8. Accident rates	0.1	0.14	0.08	0.04	-0.00	0.01	0.18**	-0.06	0.00

Notes: \* $p < 0.05$ , \*\* $p < 0.01$ .  $N$ 's = 278–322.

Table 2. Study 1: Regression results

	Workforce performance									
	Workforce productivity					Accident rates				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 1	Model 2	Model 3	Model 4	Model 5
Organization size	-0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Unionization	0.26*	0.27**	0.26*	0.24*	0.23*	0.11**	0.13**	0.13**	0.14**	0.15**
Discharge rate	-0.23*	-0.21	-0.21	-0.22*	-0.20	-0.06	0.03	0.03	0.03	0.03
Percent part time employees	0.32*	0.31*	0.30*	0.28*	0.31*	0.04	0.06	0.06	0.07	0.07
Voluntary turnover rates	-0.10	-0.10	-0.24*	-0.26*	-0.26*	0.10	0.10	0.14**	0.15**	0.15**
HRM investments	-0.04	-0.04	-0.04	-0.07	-0.17**	-0.02	-0.02	-0.02	-0.01	0.01
Voluntary turnover rates <sup>2</sup>			0.55*	0.49*	0.64**		-0.09	-0.09	-0.06	-0.15*
Voluntary turnover rates × HRM investments				-0.33	-0.61**				0.09	0.17*
Voluntary turnover rates <sup>2</sup> × HRM investments					1.50**				-0.30*	-0.30*
Total R <sup>2</sup>	0.06**	0.07**	0.09**	0.10**	0.12**	0.03*	0.06**	0.07**	0.08**	0.09**
Δ R <sup>2</sup>	0.06**	0.01	0.02*	0.01	0.03**	0.03*	0.03**	0.01	0.00	0.01*

Notes: \* $p < 0.05$ , \*\* $p < 0.01$ . Workforce productivity  $N = 243$  and accident rates  $N = 273$ . Unstandardized coefficients are reported.

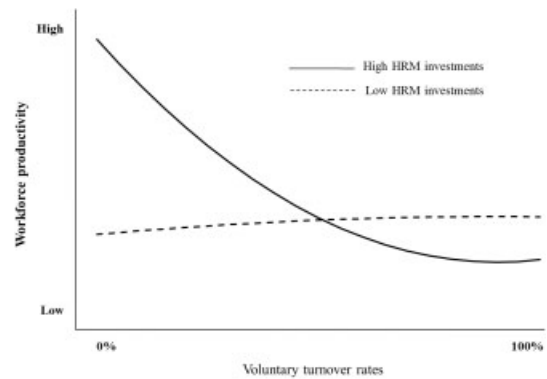


Figure 1. Study 1: The moderating role of HRM investments on the attenuated negative relationship between voluntary turnover rates and workforce productivity

not significant when HRM investments were low. An analysis of simple slopes revealed that when HRM investments were high, the linear simple slope ( $b_{\text{High HRM Linear}} = -0.56$ ,  $p < 0.01$ ) and the quadratic simple slope ( $b_{\text{High HRM Quadratic}} = 1.39$ ,  $p < 0.01$ ) were significant, but neither the linear ( $b_{\text{Low HRM Linear}} = 0.04$ , n.s.) nor the quadratic ( $b_{\text{Low HRM Quadratic}} = -0.11$ , n.s.) simple slopes were significant when HRM investments were low. To illustrate, when HRM investments were high, the predicted loss in workforce productivity was 47 percent as voluntary turnover rates increased from zero percent to mean levels, and about 31 percent as voluntary turnover rates increased from the mean to +1 standard deviation. When HRM investments were high, the zero slope point was 2.2 standard deviations from the mean, a voluntary turnover rate of approximately 74 percent. Thus, Hypothesis 2 was supported in the workforce productivity equations.

### Accident rates

As shown in the right columns of Table 2 (Model 2), the linear voluntary turnover rates term ( $b = 0.10$ ,  $p < 0.01$ ) was significant, but the HRM investments ( $b = -0.02$ , n.s.) term was not significant. The quadratic voluntary turnover rates term was not significant in Model 3 ( $b = -0.09$ , n.s.). Thus, Hypothesis 1 was not supported for accident rates. In Model 5, the interaction of voluntary turnover rates squared and HRM investments was significant ( $b = -0.30$ ,  $p < 0.05$ ), explaining an additional one percent of the variance in accident rates. As Figure 2 shows, when HRM investments were high, the

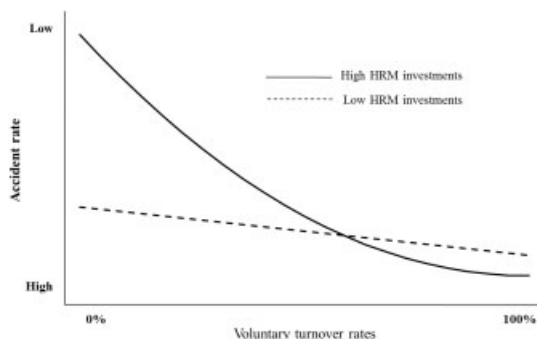


Figure 2. Study 1: The moderating role of HRM investments on the attenuated relationship between voluntary turnover rates and accident rates

linear ( $b_{\text{High HRM Linear}} = 0.24$ ,  $p < 0.01$ ) and the quadratic ( $b_{\text{High HRM Quadratic}} = -0.30$ ,  $p < 0.01$ ) simple slopes were significant, but neither the linear ( $b_{\text{Low HRM Linear}} = 0.07$ , n.s.) nor the quadratic ( $b_{\text{Low HRM Quadratic}} = 0.00$ , n.s.) simple slopes were significant when HRM investments were low. To illustrate, when HRM investments were high, the predicted increase in the accident rates was 18 percent as voluntary turnover increased from zero percent to mean levels, but the predicted increase was only six percent as voluntary turnover increased from the mean to +1 standard deviation. When HRM investments were high, the zero slope point was at 2.9 standard deviations above the mean, a voluntary turnover rate of approximately 91 percent. Thus, Hypothesis 2 was supported for accident rates.

## STUDY 2: CONTEXT AND EXTENSIONS

The findings from Study 1 provided support for our integrative theory of the relationships among human capital losses, HRM investments, and intermediate measures of workforce performance—productivity and accident rates. Our results make two contributions to the literature. First, they support the RBV reasoning that the performance-based implications of human capital depletion are not linear; the potential inimitability of human capital accumulations are lost quickly as human capital depletion through voluntary turnover first begins to occur. Second, they demonstrate that these general effects are carried only among organizations that invest heavily in human capital accumulations. These findings provide additional support for the RBV theorizing;

HRM investments increase the firm-specificity of human capital accumulations and also enhance the socially complex and path-dependent nature of human capital accumulations in high investment organizations. This may yield certain competitive advantages, but it also increases the costliness of employee departures.

Despite these strengths, the Study 1 results are limited in three key ways. First, we may reasonably question whether the Study 1 results were sample-specific rather than robust across settings and operationalizations. Our key hypothesis was a moderated quadratic prediction—akin to a three-way interaction—and interactions in field settings are often unreliable. Second, the Study 1 sample—independent supermarkets—included only small organizations and intra-industry tests of the underlying foundation. As noted above, in the supermarket setting, average human capital accumulations and HRM investments are relatively low. Although this could be considered a tough test of our hypotheses, whether the hypotheses would hold in a situation where typical human capital accumulations and HRM investments are more substantial is an open question. Thus, in the second study, we aimed to challenge our findings both in terms of the replication of the quadratic interaction and by testing our reasoning in a markedly different setting—a cross-industry sample of organizations in Korea. Korea is known for its countrywide investments in human capital for a highly skilled, high quality workforce (Bae and Rowley, 2004; Chung, 2007; Kim and Bae, 2004). Thus, to contrast with the Study 1 setting (small supermarkets) where typical human capital accumulations are minimal, we test the robustness of our model in a context where average human capital investments are quite extensive and typical human capital accumulations should be quite substantial.

Third, because of data limitations, we could not extend our model to a primary construct of interest in strategic management and strategic HRM research—financial performance or profitability (e.g., Hitt *et al.*, 2001; Ployhart *et al.*, 2009). For many years, researchers have called for theoretical and empirical elaboration of the mysterious area that lies between HRM investments on the one hand and distal measures of financial performance of organizations on the other. The literature often casts workforce performance as a key antecedent of financial performance (Delery and Shaw, 2001).



We straightforwardly extend our integrative view to a more elaborate process model that leads to financial performance. We propose that the attenuated negative relationship between human capital losses and workforce performance is stronger when HRM investments are high and that workforce performance serves as a mediator between these interactive relationships and financial performance. Stated in Edwards and Lambert's (2007) moderated-mediation parlance, the indirect and total curvilinear effects of voluntary turnover rates on the financial performance of organizations will be stronger when HRM investments are high. Thus:

*Hypothesis 3: The strength of the mediated attenuated negative relationship between human capital losses (voluntary turnover rates) and financial performance (via workforce performance) will vary depending on the extent of HRM investments; the indirect and total curvilinear effects of voluntary turnover rates on financial performance will be stronger when HRM investments are high.*

## STUDY 2: METHOD

### Sample

We obtained the Human Capital Corporate Panel (HCCP), a publicly available database collected by the Korean Research Institute for Vocational Education and Training (KRIVET) in collaboration with the Korea Ministry of Labor. In 2005, KRIVET selected and contacted 900 organizations among 7,246 Korean organizations. The stratified sampling frame represented all Korean businesses with more than 100 employees, excluding mining, fishing, forestry, agriculture, foreign company subsidiaries, and public service organizations. Usable data were received from 454 organizations (response rate = 50%). KRIVET researchers collected firm-level data using face-to-face interviews with top HRM officials and a supplemental paper-and-pencil questionnaire that required respondents to refer to the organization's human resource information system (e.g., salaries, number of employees, and voluntary turnover). KRIVET researchers also collected individual-level data from 13,101 employees (an average of 29 per organization) including perceptions of organizational

communication practices. The HCCP data were collected in 2005 with all HRM measures in the database referring to the 2004 calendar year.

The HCCP data were merged with archival performance data from the Korea Information Services (KIS), a partner organization of Moody's, and linked using a unique organizational identifier available in the HCCP. Performance data were collected for the 2005 calendar year, a one-year lag from the HCCP. Analysis sample sizes were 363 in the workforce productivity and ROA equations, and 287 in the profit equations.

### Measures

#### *Human capital losses (voluntary turnover rates)*

This variable was operationalized as the number of full-time employees who had quit in 2004 divided by the number of full-time employees in 2004. The HRM manager provided the number of quits and the total number of full-time employees. The survey prompted participants to check human resource information systems before providing the number of quits. To correct for skewness, we used the natural log of voluntary turnover rates.

#### *HRM investments*

As in Study 1, HRM investments was operationalized with an additive index of several HRM practices that represent direct and indirect investments—pay, benefits, training, communication, and selection ratio—that included dimensions provided by an HRM key informant and from aggregated responses from the employee questionnaire. *Pay level* was the average annual salary for full-time employees in the organization; *benefits level* was the average annual benefits provided to full-time employees, and *training* was the average training investment for full-time employees. The HRM key informant reported these variables in Korean won. *Communication* was a three-item measure developed by KRIVET that was included in the employee questionnaire. A sample item: 'Our company shares organization information (e.g., strategy, financial performance) with all employees through managers or company-wide communication systems.' The items had five response options from 1 (*not at all*) to 5 (*to a great extent*). Individual scale scores ( $\alpha = 0.72$ ) were aggregated to the organizational level for analysis.

Aggregation statistics revealed strong agreement ( $\text{rwg}[j] = 0.82$ ), reliability of individual assessments of team means ( $\text{ICC}[1] = 0.15$ ) and group means ( $\text{ICC}[2] = 0.84$ ). To assess selection, we used the *selection ratio*, defined as the ratio of the total number of new hires to the total number of applicants (Shaw *et al.*, 1998). Each HRM practice measure was standardized before the  $z$ -scores were averaged to form the index.

### Workforce performance

We operationalized workforce performance as the natural log of sales per employee, a measure of workforce productivity that is commonly used in the literature (e.g., Guthrie, 2001; Shaw, Gupta, and Delery, 2005). The KIS database provided total sales and total number of employees (full-time equivalent) for the 2005 calendar year. The productivity ratio had a strong skew, so we used the natural log.

### Financial performance

We operationalized financial performance as the ROA and the natural log of profit, which are commonly used in the strategic management literature (e.g., Hitt *et al.*, 2001). The KIS database provided ROA and profit for the 2005 calendar year. Profit variable was logged because of the skewness of the distribution; the distribution of ROA was not skewed so the raw ratio was used in the analyses.

### Controls

Because they are related to voluntary turnover rates, HRM investments, and organizational performance, we controlled for *industry* (Datta, Guthrie, and Wright, 2005) as well as the set of controls used in Study 1 with 2004 data available in the HCCP. Industry was controlled with 15 dummy variables to capture the 16 industries represented in our sample. The HCCP provided industry codes. Organizational size was measured as the natural logarithm of total assets. Unionization was coded 1 if a union was present and 0 if not. Discharge rate was measured by dividing the number of employees discharged by the total number of employees. Temporary employees were defined as total temporary employees by total number of employees.

## STUDY 2: RESULTS

Table 3 contains descriptive statistics and correlations, and Table 4 presents the regression results. The left side of Table 4 shows the results for workforce productivity. In Model 2, voluntary turnover rates ( $b = -0.42, p < 0.05$ ) was significant, but the HRM investments term was not ( $b = 0.05, \text{n.s.}$ ). In Model 3, voluntary turnover rates squared was significantly related to workforce productivity, as predicted ( $b = 1.71, p < 0.01$ ), explaining an additional one percent of the variance in workforce productivity. Supporting Hypothesis 1, the relationship was strongly negative initially, but weakened as voluntary turnover rates increased and reached a zero-slope point at 3.7 standard deviations from the voluntary turnover rates mean—approximately 70 percent.

In Model 5, the interaction of the HRM investments and voluntary turnover rates squared was significant ( $b = 1.37, p < 0.01$ ), explaining an additional two percent of the variance. As Figure 3 shows, when HRM investments were high, the nature of the voluntary turnover rates-workforce productivity relationship was curvilinear in the shape of an attenuated U with a zero-slope point at 4.3 standard deviations from the mean—a rate of approximately 80 percent. An analysis revealed that when HRM investments were high, the linear ( $b_{\text{High HRM Linear}} = -1.24, p < 0.01$ ) and quadratic ( $b_{\text{High HRM Quadratic}} = 1.51, p < 0.01$ ) simple slopes were significant, but only the linear ( $b_{\text{Low HRM Linear}} = -0.64, p < 0.01$ ) term was significant when HRM investments were low ( $b_{\text{Low HRM Quadratic}} = 0.47, \text{n.s.}$ ). The predicted loss in workforce productivity was 58 percent as voluntary turnover rates increased from the zero to mean level, 35 percent as voluntary turnover rates increased from mean to +1 standard deviation levels, 26 percent as voluntary turnover rates increased from the +1 to +2 standard deviations. Thus, Hypothesis 2 was supported.

The middle columns of Table 4 show the results when ROA was the outcome. Model 2 showed that both voluntary turnover rates ( $b = -11.00, p < 0.05$ ) and voluntary turnover rates squared ( $b = 16.40, p < 0.05$ ) were significant, explaining one percent of the variance. A plot of this relationship showed that initially the relationship was strongly negative, but weakened as voluntary turnover rates increased and reached a zero-slope point at 3.5 standard deviations from the

Table 3. Study 2: Descriptive statistics and correlations

	Mean	SD	1.	2.	3.	4.	5.	6.	7.	8.
1. Organization size	18.46	1.87								
2. Unionization	0.51	0.50	0.44**							
3. Discharge rate	0.02	0.09	0.04	0.02						
4. Percent temporary employees	0.14	0.22	-0.17**	-0.05	-0.06					
5. HRM investments	-0.03	0.38	0.26**	0.10*	-0.04	0.35**				
6. Voluntary turnover rates	0.14	0.15	-0.24**	-0.31**	0.05	-0.02	-0.08			
7. Workforce productivity	5.65	0.98	0.62**	0.23**	0.01	-0.24**	0.16**	-0.26**		
8. ROA	3.61	9.84	-0.04	-0.06	0.03	0.03	0.06	-0.07	0.05	
9. Profit	9.68	1.94	0.35**	0.02	0.01	-0.02	0.15**	-0.10*	0.40**	0.22**

Notes: \* $p < 0.05$ , \*\* $p < 0.01$ .  $N's = 344-451$ .

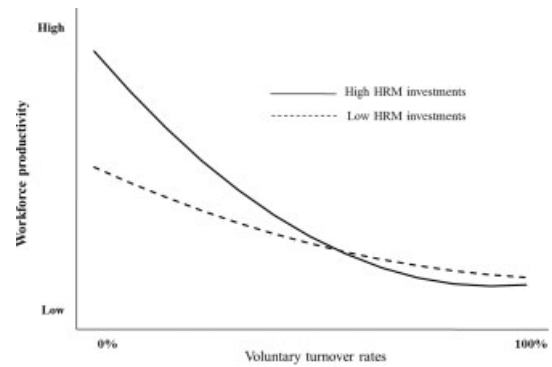


Figure 3. Study 2: The moderating role of HRM investments on the attenuated negative relationship between voluntary turnover rates and workforce productivity

voluntary turnover mean. In Model 3, the mediator, workforce productivity, was significant ( $b = 2.64$ ,  $p < 0.01$ ), explaining two percent of the variance.

The right side of Table 4 shows the results when profit was the outcome. Model 2 showed that neither the linear ( $b = -0.12$ , n.s.) nor the quadratic ( $b = 1.48$ , n.s.) voluntary turnover rates terms were significant. In Model 3 the workforce productivity mediator was significant ( $b = 0.95$ ,  $p < 0.01$ ), explaining 11 percent of the additional variance.

To test Hypothesis 3, we took the nested-equations path analytic approach to moderated mediation from Edwards and Lambert (2007). First, the curvilinear effects of voluntary turnover rates and the predicted interaction effect between voluntary turnover rates squared and HRM investments on workforce productivity were estimated in Equation (1):

$$M = a_0 + a_1X + a_2X^2 + a_3Z + a_4XZ + a_5X^2Z + e_M \quad (1)$$

where  $M$  refers to the mediator workforce productivity,  $X$  refers to voluntary turnover rates,  $X^2$  refers to voluntary turnover rates squared, and  $Z$  refers to the moderator, HRM investments.

The second equation estimates the effects of voluntary turnover rates and the workforce productivity mediator on the distal outcome variable—financial performance:

$$Y = b_0 + b_1X + b_2X^2 + b_3M + e_Y \quad (2)$$

where  $Y$  refers to financial performance (ROA or profit).

Table 4. Study 2: Regression results

	Financial performance									
	Workforce productivity					ROA				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 1	Model 2	Model 3	Model 1	Model 2
Industry dummy variables	—	—	—	—	—	—	—	—	—	—
Organizational size	0.33**	0.31**	0.31**	0.31**	0.30**	0.76	0.51	—	0.42**	0.42**
Unionization	—0.1	—0.13*	—0.2**	—0.2**	—0.19**	—2.46*	—3.46**	—2.94*	—0.58**	—0.59**
Discharge rate	0.14	0.28	0.1	0.15	0.15	—5.74	—5.69	—5.96	—1.09	—1.27
Percent temporary employees	—0.2	—0.26	—0.34	—0.35	—0.41*	—2.28	—3.59	—2.69	0.1	0.22
Voluntary turnover rates	—0.42*	—0.42*	—1.01**	—1.07**	—0.94**	—	—11*	—8.33*	—	—0.12
HRM investments	—	—	—	—	—	—	—	—	—	—
Voluntary turnover rates <sup>2</sup>	—	—	—	—	—	—	—	—	—	—
Voluntary turnover rates <sup>2</sup> × HRM investments	—	—	—	—	—	—	—	—	—	—
Voluntary turnover rates <sup>2</sup> × HRM investments	—	—	—	—	—	—	—	—	—	—
Workforce Productivity	—	—	—	—	—	—	—	—	—	—
Total R <sup>2</sup>	0.54**	0.55**	0.57**	0.57**	0.59**	0.12**	0.14**	0.15**	0.29**	0.3**
ΔR <sup>2</sup>	0.54**	0.01*	0.01**	0.00	0.02	0.12**	0.01	0.02	0.29**	0.00

Notes: \* $p < 0.05$ , \*\* $p < 0.01$ . Workforce productivity and ROA  $N = 363$  and Profit  $N = 287$ . Unstandardized regression coefficients are reported.



Substituting Equation (1) for M in Equation (2) produced the reduced form equation for the first-stage moderation model:

$$Y = b_0 + b_1X + b_2X^2 + b_3(a_0 + a_1X + a_2X^2 + a_3Z + a_4XZ + a_5X^2Z + e_M) + e_Y \quad (3)$$

Equation (3) can then be dispensed and rewritten in terms of simple paths to clarify the direct, indirect, and moderating effects:

$$Y = [b_0 + (a_0 + b_3a_3Z) b_3] + [b_1 + (a_1 + a_4Z) b_3] X + [b_2 + (a_2 + a_5Z) b_3] X^2 + b_3e_M + e_Y \quad (4)$$

In Equation (4), the direct effect of X (voluntary turnover rates) on Y (financial performance) is captured by the term  $b_1$ , the direct curvilinear effect of X on Y is captured by the term  $b_2$ , and the indirect effect of X on Y across different levels of Z (HRM investments) is captured by the product term,  $(a_1 + a_4Z)b_3$ , and the indirect curvilinear effect of X on Y across different levels of Z is captured by the product term,  $(a_2 + a_5Z)b_3$ .

We described the direct, indirect, and total linear and *curvilinear* effects of voluntary turnover rates at different levels of HRM investments using path analysis conventions. That is,  $P_{MX}$  refers to the linear paths from X (voluntary turnover rates) to M (workforce productivity),  $P_{MX}^2$  refers to the curvilinear paths from  $X^2$  (voluntary turnover rates squared) to M;  $P_{YM}$  is the path from M to Y (financial performance);  $P_{YX}$  is the linear path from X to Y (the direct linear effect of voluntary turnover rates on financial performance);  $P_{YX}^2$  is the path from  $X^2$  to Y (the direct curvilinear effect of voluntary turnover rates on financial performance);  $P_{YM} * P_{MX}$  is the indirect linear effect,  $P_{YM} * P_{MX}^2$  is the indirect curvilinear effect,  $P_{YX} + P_{YM} * P_{MX}$  is the total linear effect of X on Y, and  $P_{YX}^2 + P_{YM} * P_{MX}^2$  is the total curvilinear effect of X on Y. Following Edwards and Lambert's (2007) suggestions, we constructed confidence intervals for the significance tests of indirect effects by estimating the sampling distributions of the product of regression coefficients using a bootstrap procedure with 1,000 samples. The path analytic results are shown in Table 5. In the top half of the table, the path estimates revealed that

Table 5. Study 2: Path analytic results: indirect and total effects of human capital losses (voluntary turnover rates) via workforce productivity on ROA and profit at low and high levels of HRM investments

	First stage		Second stage		Direct effects		Indirect effects		Total effects		
	$P_{MX}$	$P_{MX}^2$	$P_{YM}$		$P_{YX}$	$P_{YX}^2$	$P_{YM}P_{MX}$	$P_{YM}P_{MX}^2$	$P_{YX} + P_{YM}P_{MX}$	$P_{YX}^2 + P_{YM}P_{MX}^2$	
<b>ROA</b>											
Simple paths for high HRM investments	<b>-1.74**</b>	<b>2.36*</b>	2.64*		-8.33*	11.88	<b>-4.59*</b>	<b>6.23*</b>	<b>-12.92**</b>	<b>18.11**</b>	
Simple paths for low HRM investments	<b>-1.40</b>	<b>-0.38</b>	2.64*		-8.33*	11.88	<b>-0.37</b>	<b>-1.00</b>	<b>-8.70*</b>	<b>10.88*</b>	
<b>Profit</b>											
Simple paths for high HRM investments	<b>-1.74**</b>	<b>2.36*</b>	0.95**		0.81	-0.26	<b>-1.65**</b>	<b>2.24*</b>	<b>-0.84</b>	<b>1.99</b>	
Simple paths for low HRM investments	<b>-0.14</b>	<b>-0.38</b>	0.95**		0.81	-0.26	<b>-0.13</b>	<b>-0.36</b>	<b>0.68</b>	<b>-0.62</b>	

Notes: \* $p < 0.05$ , \*\* $p < 0.01$ . ROA  $N = 363$  and Profit  $N = 287$ . Coefficients in bold are significantly different across HRM investments levels.

the effects of voluntary turnover on ROA through workforce performance varied significantly across levels of HRM investments. When HRM investments were high, the indirect ( $P_{YM}P_{MX}^2 = 6.23$ ,  $p < 0.05$ ) and the total ( $P_{YX}^2 + P_{YM}P_{MX}^2 = 18.11$ ,  $p < 0.01$ ) curvilinear effects of voluntary turnover rates on ROA through workforce productivity were significant. When HRM investments were low, the indirect curvilinear effects of voluntary turnover on ROA were not significant ( $P_{YM}P_{MX}^2 = -1.00$ , n.s.), but the total curvilinear effects were significant ( $P_{YX}^2 + P_{YM}P_{MX}^2 = 10.88$ ,  $p < 0.05$ ). The test of Hypothesis 3 tests the significance of the difference between the indirect and total effects across HRM investments levels. As shown, both the indirect and total effects were significantly stronger when HRM investments were high. Thus, Hypothesis 3 was supported for ROA.

The bottom half of Table 5 shows the path analytic results for profit. When HRM investments were high, the indirect curvilinear effects of voluntary turnover rates on profit through workforce productivity were significant ( $P_{YM}P_{MX}^2 = 2.24$ ,  $p < 0.05$ ), but the total effects were not ( $P_{YX}^2 + P_{YM}P_{MX}^2 = 1.99$ , n.s.). When HRM investments were low, neither the indirect ( $P_{YM}P_{MX}^2 = -0.36$ , n.s.) nor the total curvilinear effects were significant ( $P_{YX}^2 + P_{YM}P_{MX}^2 = -0.62$ , n.s.). The difference tests revealed that the indirect effects were significantly stronger when HRM investments were high. Thus, for profit, Hypothesis 3 was partially supported; that is, Hypothesis 3 was supported in terms of indirect effects but not in terms of total effects.

## DISCUSSION

In this study, we contribute to the literature by (1) developing and testing the resource-based perspective on the relationships among human capital losses, HRM investments, and workforce performance, (2) testing and finding support for the theory with two measures of workforce performance in an intra-industry study of supermarkets, and (3) advancing and testing an extended process model of these relationships that includes financial performance in a cross-industry sample of Korean organizations. In Study 1, we find support for the predicted moderating effect of HRM investments

such that human capital losses, in the form of voluntary turnover rates, have an attenuated negative relationship with organizational performance when HRM investments are high. When HRM investments are low, however, human capital losses and organizational performance are not significantly related. In Study 2, we provide evidence that when organizations invest heavily in HRM, the indirect and total effects of the human capital losses on financial performance through workforce productivity are significantly stronger than the effects among organizations with lower HRM investments.

The most significant contribution of our two studies is the extension of resource-based theorizing to the issue of HRM investments and human capital *losses*. This approach contrasts with the literature's general focus on HRM investments and human capital *accumulations* (e.g., Crook *et al.*, 2011; Lepak and Shaw, 2008). Most researchers in strategic HRM have focused on the value that investing in human capital can bring organizations in terms of, in RBV parlance, rarer, more valuable, non-substitutable, and inimitable resources. The literature has generally conceded that organizations can increase their performance by investing in such practices; indeed, researchers often use the significance of a relationship between HRM investments and organizational performance as providing support for the RBV tenets (Barney and Wright, 1998). The literature has heavily criticized claims about such relationships and RBV because of the difficulty in matching operationalizations of resources to the criteria for sustained competitive advantage (rareness, value, non-substitutability, and inimitability) (e.g., Newbert, 2007).

A different approach to testing theoretical ideas from the RBV, however, is to identify resources that may meet the criteria for sustained advantage and then to observe what happens when these resources are depleted. Following this lead and a few earlier works (e.g., Guthrie, 2001), we reverse our focus from the monotonic gains in organizational performance via higher HRM investments, toward an assessment of the potentially dramatic performance decrements that can occur when organizations begin to lose accumulated human capital through voluntary turnover. We argue that human capital can meet the criteria for sustained advantage when HRM investments are high because such practices increase the knowledge and skills of the workforce and also increase the

connectedness of human capital. According to the RBV, this creates path dependence, social complexity, and time-compression diseconomies that make imitation difficult. If RBV theorizing is correct, we should observe the most dramatic performance decrements when the superior resources (here, human capital accumulations) begin to be depleted. Once the superior, advantage-granting human capital has sustained initial losses, further depletions should be less damaging to performance. Our results, across two samples with significantly different characteristics, reveal that among high HRM investment organizations, human capital losses are most damaging to performance as they initially increase, but the relationship is weakened at higher loss levels. Across our outcome variables, predicted performance for high HRM investment organizations conform with or are below the performance levels of low HRM investment organization at high voluntary turnover levels. Thus, although the literature implies that HRM investments are generally good for organizations (e.g., Delery and Shaw, 2001), our findings demonstrate that they risk more dramatic performance decrements through human capital depletion. As argued in our introduction, human capital losses are essentially irrelevant in terms of organizational performance among organizations with low HRM investments. In summary, researchers have often implied that a 'fine line' exists between organizations that sustain their competitive edge over their rivals and the rivals themselves (Barney, 1991; Delery and Shaw, 2001). The current findings speak to the overall robustness of the effects, but also provide a different, loss-based, approach for testing underlying RBV tenets.

We encourage future researchers in strategic HRM and, researchers interested in the RBV in general to extend our theoretical knowledge by focusing further on losses of key resources. The focus on resource depletion could be extended to tests of the RBV for other types of resources. For example, in addressing criticisms of the RBV, including suppositions that sustained competitive advantage cannot be achieved, Kraaijenbrink, Spender, and Groen (2010: 354) noted that 'inimitability is progressively compromised by "spillovers" as the firm's products and service continue to reveal strategic information about the processes that produce them.' Thus, research on losses and recoveries, in terms of human capital resources and organizational resources in general,

would move in the right direction. Considerable potential exists to integrate a loss-based approach to testing RBV concepts with the literature on competitive actions (e.g., Rindova, Ferrier, and Wiltbank, 2010).

As a final implication, our study joins a litany of others that included tests for curvilinearity that could have uncovered, but did not detect, evidence of an optimal rate of voluntary turnover, a common theoretical position in the turnover literature (e.g., Abelson and Baysinger, 1984). As Shaw (2011) recently noted, the literature is bereft of evidence that modest levels of voluntary turnover has an invigorating effect on organizational performance. Indeed, most of the recent evidence favors a curvilinear formulation that is in line with our current findings, specifically, that performance-based losses of human capital depletion are the *most damaging*, rather than beneficial, at the outset. There is some evidence, however, that certain forms of organizationally controllable turnover can have beneficial effects. For example, Siegel & Simons (2010) found that productivity increased after partial mergers and acquisitions (M&A), although the workforces also declined in size in these situations, presumably through downsizing. Their findings imply sorting effects that benefit organizations in M&A situations. We encourage additional research of this nature as well as studies that examine how organizations can use strategic HRM practices to effectively sort their workforces by performance levels (e.g., Shaw *et al.*, 2009) or by differing employment relationships (e.g., Siebert and Zubanov, 2009).

Our research designs allowed an initial examination of human capital as a key resource, but panel designs in recent studies (e.g., Ployhart *et al.*, 2009) show that human capital 'stocks and flows' are also important for organizational performance. Future research that incorporates HRM investments and HRM investment changes over time would be a major advancement toward understanding when human capital losses are most damaging and how organizations might recover from such losses. Moreover, the investigation of the fit and misfit between HRM investments and human capital losses deserves further attention. Strategic HRM literature has shown that HRM investments can prevent employee quits (e.g., Shaw *et al.*, 1998); indeed, our results show a significant negative relationship. Our model and results also suggest that organizations may miscalculate

the effects of their investments in stemming human capital losses. Many organizations in our sample had relatively high investments and high human capital losses. As an anonymous reviewer suggested, these mismatches might be explained by the lack of internal consistency or complementarity in the system, despite heavy investment levels. The literature has long considered internal fit or configurations of HRM practices (e.g., Delery and Doty, 1996), and recent research has shown that investments in certain compensation practices may send mixed signals and yield different quit patterns (e.g., Shaw and Gupta, 2007). In addition to further replications of our model, research that accounts for internal synergies and helps explain why these investment-loss combinations occur would be a major advancement.

Readers should evaluate our results in light of some limitations. First, we obtained many of our variables from organizational key informants (store managers in Study 1 and HRM officials in Study 2), so the reliability and validity of these reports may be questioned. These concerns may be assuaged to some extent because the supermarkets in Study 1 were quite small, which may have yielded greater reporting accuracy. Study 2 informants were encouraged to examine organizational records where appropriate before they reported the data, which may have increased reporting accuracy. Key HRM informants and employee reports provided the dimensions for our measure of the HRM investment index. In Study 1, supermarket managers reported the variables in the accident rates equations, raising the question of common-method effects. These biases, however, fail to explain the higher-order effects that confirm predicted patterns (Siemsen, Roth, and Oliveira, 2010). In addition, although both studies use workforce productivity and financial performance data obtained from separate sources and lagged from turnover rates by one year, we cannot firmly establish a causal sequence. Although our underlying theory suggests a certain causal flow, and the patterns of results are supportive, other sequences are possible (e.g., better organizational performance reduces quit rates and encourages more HRM investments). In general, however, tests of reverse causality in the literature have provided support for our presumed causal sequence and not the reverse. For example, after an extensive series of tests, Siebert and Zubanov (2009: 308) concluded that 'turnover indeed influences labor productivity,

and not the other way around.' We also use an additive index to operationalize HRM investments. Although this approach is common in the literature, it assumes substitutability and equal weight among HRM practices. Future research should address the unanswered question of whether each practice contributes equally to human capital accumulation or confers equal advantage or disadvantage when paired with human capital losses. Finally, we found that the curvilinear relationship between voluntary turnover rates and organizational performance is generalizable across two different institutional contexts, the United States and Korea, but the relationship may not hold in different institutional contexts such as European countries and other Asian countries (e.g., China). The Korean labor market was historically rigid, but it has become rapidly flexible and more unstable since the 1997 financial crisis (Chang, 2003; Cho, 2004). Thus, our results may hold only in countries where labor market flexibility is relatively high such as the United States and Korea. Indeed, Park and Shaw's () meta-analysis revealed that the correlation between turnover rates and organizational performance is less negative in European samples compared to North American samples. European labor markets are known for high rigidity levels, restrictive legislation, generous unemployment benefits, and strong unionization (Nickell, 1997). The implication is that turnover rates may be less damaging to performance in situations where turnover rates—as a function of labor market rigidity, work rules, and legislative intensity—are more predictable. Thus, although our studies address the generalizability of the voluntary turnover and organizational performance relationship across two distinct settings—the United States and Korea—we encourage future researchers to further theorize how the relationship could be differentiated in different institutional contexts. Countering these limitations, we replicate theory-driven interaction results in single- and cross-industry samples, with separate-source, time-lagged data for predictors and outcomes, with two indicators of workforce performance (productivity and accidents) and financial performance, and with data obtained from organizations in two national and cultural contexts. We encourage replications as well as additional research on human capital losses and the potentially divergent consequences for organizational performance.



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