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Does intellectual capital mediate the relationship between HRM and organizational performance? Perspective of a healthcare industry in Taiwan

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Previous studies indicate that the linkage between human resource management (HRM) practices and organizational performance is tenuous. Some key intermediate elements evidently have not been accounted for. In an era where intangibles have become the source of wealth and progress, intellectual capital could be one of the missing links. Therefore, this study predicts that the three components of intellectual capital, namely, human capital, relational capital, and organizational capital, mediate the relationship between HRM practices and organizational performance. Data from 277 hospitals, with a response rate of 56%, confirm the mediation role of intellectual capital in explaining the effect of HRM practices on organizational performance.

Keywords: healthcare industry; HRM; intellectual capital; mediation; organizational performance; Taiwan

Introduction

Over the past few decades, intangibles have become a fundamental source of wealth and progress and represent a major concern for organizations, their stakeholders and policy makers (Garcia-Ayuso 2003). Scholars highlighted the emergence of a society dominated by knowledge resources and a competitive landscape of intellectual capital allocation (Bontis 2004). In the mainstream management literature, there is a growing interest in the concept of intellectual capital as the strategic leadership needed in twenty-first century firms. It should be involved with building company resources and capabilities with an emphasis on intellectual capital (Hitt and Ireland 2002). In knowledge-intensive industries, such as healthcare, added value accrues mainly from intangible services provided by medical professionals in the form of collective and synergetic human performance. Therefore, effective human resource management may facilitate the accumulation of an organizational-level intellectual capital in this competitive and knowledge-intensive era.

Since intellectual capital is pivotal to an organization's lasting success, its creation, accumulation and re-creation should be a major concern of the top management team, especially the human resource director who is responsible for employee performance. As Pfeffer (1994) observed, human resource management (HRM) plays a key role in facilitating the contribution of the talented individuals in an environment with increasing

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competitive pressures from the knowledge and global economy. Scholars also point out that human resource managers are beginning to be viewed as human capital asset managers and as potential sources of competitive advantage (Wright and Snell 1991; Lepak and Snell 2003; Schuler and Jackson 2005). Therefore, the HRM system of attracting, selecting, deploying, retaining, and transforming valuable human resources is gaining importance in the process of creating, accumulating and recreating intellectual capital.

Past studies of HRM have characteristically entered one of two major streams. The first stream focuses on various functions of human resource management, namely, recruiting and selection, training and development, performance appraisal, and compensation (Youndt, Snell, Dean and Lepak 1996; Huselid, Jackson and Schuler 1997; Schuler and Jackson 2005). The second stream examines strategic human resource management, including empowerment, high performance work systems and its relationship with organizational performance (Becker and Huselid 1998; Bae, Chen, Wan, Lawler and Walumbwa 2003; Collins and Clark 2003; Chan, Shaffer and Snape 2004). This study is primarily devoted to an examination of functional HRM practices. It is our contention that intellectual capital is accumulated over time through the effects of daily HRM practices, which in turn should provide a basis for a future investigation on the effect of strategic HRM.

An extensive literature review has uncovered two sets of relationships with respect to our topic of interest, namely, 'good HRM explains a higher degree of intellectual capital' (e.g., Snell and Dean 1992; Minbaeva 2005; Davis 2006) and 'a higher degree of intellectual capital predicts organizational performance' (e.g., Youndt et al. 1996; Tsai and Ghoshal 1998; Lepak and Snell 1999; Carpenter, Sanders, Gerard and Gergersen 2001; Hitt, Bierman, Shimizu and Kochhar 2001). However, the linkage of whether 'better HRM facilitates the accumulation of intellectual capital which then leads to better organizational performance' is still unclear. In addition, HRM-related studies indicate that HRM practices alone only explain a small portion of organizational performance. For instance, Bhattacharya, Gibson and Doty (2005) reported skill, behavior and HR practice flexibility together explain 8% incremental variance in a firm's financial performance and Collins and Clark (2003) found that network-building HR practices explained about 7% of sales growth. From an HRM perspective, apparently some key elements are missing in explaining organizational performance. Roos, Fernstrom and Pike (2004) pinpointed that the links between HRM and business performance have proved almost impossible to identify and suggest that the best prospect of linking HRM practices and business performance is intellectual capital. Therefore, the primary interest of this study is to connect the two sets of relationships to see whether intellectual capital mediates the relationship between HRM practices and organizational performance.

In this study, we follow the concept proposed by Bukh, Larsen and Mouritsen (2001) of three closely linked elements: 'what is done', 'what is', and 'what happens' to assess intangible assets in an organization. 'What is done' focuses on the question 'Are we carrying out the right qualification or upgrade activities?' which for the purposes of this study refers to HRM practices. 'What is' information is connected to the question 'Do we have the right resource portfolio?' which for this study means the intellectual capital. 'What happens' information is concerned with the question 'Have the activities we carried out worked?' which in this study refers to organizational performance.

Specifically, this study attempts to answer the following questions: What HRM practices can best explain intellectual capital? Does intellectual capital explain

organizational performance? Does intellectual capital mediate the relationship between HRM practices and organizational performance?

The context of our study – the healthcare industry in Taiwan – adds value to this field of study for two major reasons. First, Schuler and Jackson (2005) have attested to the growing importance of the international perspective in their report on a quarter-century review of HRM in the US. Thus, with its Asian context this research enriches the literature of this field of study traditionally dominated by Western studies. Second, as healthcare facilities are staffed primarily by a highly knowledgeable workforce of doctors, nurses and medical professionals, this industry provides a good platform whereby the significance of intellectual capital can be thoroughly examined.

Literature review

The importance of intellectual capital is justified by the gap between an organization's market value and its book value (Edvinsson and Malone 1997) and the value of HRM practices has been well recognized (Pfeffer 1994; Huselid 1995; Huselid, Jackson and Schuler 1997; Becker and Gerhart 1996; Delaney and Huselid 1996; Paul and Anantharaman 2003). In what follows, we first briefly define intellectual capital which contains human capital, relational capital, and organizational capital; and then review relevant theories in an attempt to provide our rationale in formulating the HRM–intellectual capital–organizational performance relationship; afterwards we introduce functional HRM to explain its relationship with the three capital components and derive relevant research hypotheses.

Definition

Intellectual capital is defined as 'intellectual material – knowledge, information, experience, core technique, intellectual property, and customer relationship – that can be put to use to create wealth' (Stewart 1997). The intellectual capital of an organization has been reported to be three to four times over its book value (Edvinsson and Malone 1997). A literature review revealed that intellectual capital could mainly be represented by three components: human capital; relational capital; and organizational capital (Edvinsson and Malone 1997; Stewart 1997; Youndt and Snell 2004). Human capital means all knowledge, skills, and experience of both employee and manager; relational capital is an intermediary form of intellectual capital consisting of knowledge resources embedded within, available through, and derived from networks of relationships between peers, customers, suppliers, and business associates; and organizational capital represents institutionalized knowledge and codified experience stored in databases, routines, patents, manuals, structures, and the like (Bontis 1998; Stewart 1997; Youndt and Snell 2004). Together, these three new forms of capital capture a company in motion as it transforms its skills and knowledge into competitiveness and wealth (Davis 2006).

Theoretical basis

The theoretical basis of this study is human capital theory and resource-based theory. Human capital theory adopts a cost/benefit perspective for the purpose of examining an organization's human management (Becker 1964; Flamholtz and Lacey 1981; Schultz 1961; Tsang, Rumberger and Levine 1991). This theory stipulates three tenets. First, investments in employee development in terms of skills and knowledge are justifiable only when future productivity exceeds the cost; second, investments in firm-specific skills

should be incurred by the company, whereas general skills should be incurred by the employee him/herself; third, companies should seek to protect their human resources from being transferred to other firms. This theory explains well the relationship between HRM and human capital accumulation.

Resource-based theory stipulates that organizations differ in their unique bundles of resources and capabilities (e.g., Penrose 1959; Prahalad and Hamel 1990; Barney 1991). This idiosyncrasy further leads to differing levels of performance outcomes, which differentiate 'successful' firms from 'unsuccessful' firms. Thus, a company's most important task is to maximize performance outcomes through the optimal deployment of existing resources and capabilities, while at the same time developing its resource base to remain competitive in the future (Grant 1996; Teece, Pisano, and Shuen 1997). In such case, competitors would find it difficult to imitate this unique and yet valuable bundle of resources (Teece et al. 1997). Adler and Kwon (2002) found that intangible resources embedded in human capital and combined with other tangible/intangible resources in a supplementary fashion (organizational and relational capital in this study) are very likely to generate value for organizations. This theory supports our inference that a higher degree of intellectual capital results in better organizational performance.

Relationships between HRM and intellectual capital

Generally, major HRM practices include staffing, training and development, performance appraisal, and compensation (e.g., Huselid et al. 1997; Schuler and Jackson 2005). HRM provides many valuable tools necessary to manage, develop, and transform human resources into human capital with an attempt to ensure a high degree of functional integration in order to realize the overall corporate mission. In what follows, the connection between HRM practices and three types of capital – human capital, relational capital, and organizational capital – will be elaborated.

Human capital

Scholars regard human capital as composed of three key elements, namely, the ability to compete, work attitude, and quickness in response (Roos, Roos, Dragonetti and Edvinsson 1997). Drawing upon various studies (Hitt and Ireland 2002; Kang, Morris and Snell 2007), we define human capital as the core asset of an organization, including knowledge, skills, experience, competence, attitude, commitment, and individual personal characteristics; in other words, a firm's repository of valuable knowledge and skills. Human capital can serve as an organizational profit lever (Bontis and Fitz-enz 2002) and is the greatest and most powerful asset an organization possesses in sustaining its competitive advantage. Therefore, leveraging human capital is no longer a matter of choice; it is a matter of survival.

HRM practices are seen as investments in human capital (Snell and Dean 1992), so when employees perform, they add value to the company. One of the most obvious ways firms enhance their stock of human capital is through the individuals they hire (Parnes 1984). Lepak and Snell (1999) said that human capital is the result of a firm's making a deliberate investment through hiring certain individuals on the market. For effective *recruiting and selection*, some companies utilize various tests, including an achievement test, a personality test, and a series of interviews; some launch rather aggressive programs by paying special attention to the potential of new recruits in key positions and by implementing a sound mentoring program. In addition, some forward-looking companies

brainwash their incumbents into adopting a 'better-than-self' recruiting policy. In short, the HR configuration focuses on identifying workers with specific skills who can perform and become human capital that enhances organizational competitiveness.

In addition to recruitment, Bontis and Fitz-enz (2002) observed that organizations invest in human capital accumulation primarily through *training and development*. Human capital theorists suggest that firms should invest in their employees to develop their unique and firm-specific skills through extensive training initiatives; resource-based theorists also propose that core employee skills should be developed and maintained internally (Lepak and Snell 1999). Especially in a knowledge economy in which tacit knowledge is a precious commodity, internal training and the development of inimitable core competency are of particular importance to increase the specificity of human capital (Lepak and Snell 2002). Internal development has also been linked to greater stability and predictability of a firm's stock of human capital, higher commitment of employees to an organization, and better coordination and control (Tsui, Pearce, Porter and Tripoli 1997). There is also extensive evidence that investment in employees' training enhances the human capital of the firm (Minbaeva, Pedersen, Bjorkman, Fey and Park 2003).

Furthermore, it has been observed that *performance appraisal* is one of the key measures that enhance organizational human capital (Huang, Roy, Ahmed, Heng and Lim 2002; Rutherford, Buller and McMullen 2003), as the system provides employees with feedback on their performance and gives direction for enhancing their competencies, including self-development, to meet the needs of the firm. It also motivates employee behaviour and enhances results in individual or work group performance (Roos et al. 2004). All in all, developmental performance appraisal constitutes an investment in firm-specific human capital and may be a potent source of sustained competitive advantage (Snell and Dean 1992; Lado and Wilson 1994).

An effective reward system is another key to induce individuals to join a firm and perform well over time. It is crucial for firms to retain and strengthen human capital with fair and competitive *compensation* (Geiger and Cashen 2007). An attractive compensation package must have both internal equity and external competitiveness, meaning the total package should be competitive in the marketplace while being perceived as a fair reward among peers (Terpstra and Honoree 2003). In other words, competitive compensation is instrumental in creating committed, long-term employment relationships and helps accumulate precious human capital (Huang et al. 2002; Roos et al. 2004).

In addition to the above four HRM practices, we would like to add *health and safety*. Although generally excluded in most of HRM-organizational performance relationship research (e.g., Becker and Gerhart 1996; Bae and Lawler 2000; Huang et al. 2002), it is another HRM practice that helps retain qualified employees and is of particular importance in the healthcare industry. For instance, more and more hospitals in Taiwan pay special attention to and monitor monthly the number of cases violating government and hospital regulated safety rules (such as providing medical care without wearing gloves) in order to enforce a safer working environment for employees and at the same time to assure the patients their medical service quality. In the coal industry, a study of people management calls for a need to address the issues of occupational health and safety as coalmines represents the most hazardous sector in the industry (Zheng, Milia, Rolfe and Bretherton 2007). Holden and Roberts (2000) also suggest that line managers increasingly should have responsibility for some HRM performance, including health and safety monitoring and record keeping. In addition, quality of work life, represented by a healthy and safe working environment in the healthcare industry, has become an important job selection criterion (Jones, Comfort and Hillier 2006) and helps retain qualified human resources.

With increasing competitive pressures from the knowledge and global economy, talented human resources have become more and more critical for achieving competitive advantage (Pfeffer 1994). As outlined by Huselid (1995), organizations that place emphasis on achieving enhanced employee capability should employ HRM practices that aim at acquiring, developing and retaining human capital. In summing up the above literature, we hypothesize that:

Hypothesis 1: A higher rating of HRM practices predicts a higher degree of human capital.

Relational capital

Relational capital (termed social capital in other studies) provides access to critical resources (Hitt et al. 2001). It is an essential part of intellectual capital and is the value embedded in both internal relationships (among employees) and external relationships (those of customers, stakeholders, and partners) (Nahapiet and Ghoshal 1998). Since this study investigates the interactions between the internal HRM and organizational-level intellectual capital accumulation, we will focus on the internal relational capital only.

Relational capital entails a web of relationships and yields potential opportunities for the holders of the capital. It reflects the value of relationships and a quality existing among people and organizations. Kang and associates (2007) advocated that human resources contribute to improving a firm's ability to explore and exploit knowledge through maximizing the value embodied in relationships. That is, HRM practices help build social relations among employees by improving their opportunity, motivation, and ability to assess and mobilize one another's knowledge. For instance, team training facilitates social interaction opportunities that build up comradeship and knowledge exchange habits; mandate performance appraisal feedbacks promote the interactions between supervisors and subordinates; and incentives for knowledge sharing motivate the formation of close knit communities for potential product innovation.

However, they also found that relatively little effort has been made to identify the social relations among employees that provide the mechanisms to facilitate the efficient flow of knowledge and organizational learning as the source of value creation. As a result, to attain effective relational capital, there has to be an organization-wide system with HRM serving as the catalyst. HRM practices can be intentionally targeted toward managing internal social relations, which help build social relations among employees. We therefore hypothesize that:

Hypothesis 2: A higher rating of HRM practices predicts a higher degree of internal relational capital.

Organizational capital

Organizational capital encompasses any structural element of an organization that facilitates the employees' ability to create wealth for the firm and its stakeholders. Hence, this construct includes efficiency, transaction time, procedural innovativeness, and access to information for knowledge codification (Bontis 1999). Process effectiveness is very important as it involves the internal procedures that allow for knowledge integration and capability sharing, which results in wealth creation for the organization. In addition, the knowledge management processes contribute to the effectiveness of customer generation (Zablah, Bellenger and Johnston 2004). These processes and infrastructure are usually developed with the organization's human resources. For instance, interactivities among individuals serve as an essential element for organizational knowledge that is processed

through socialization, combination, externalization, and internalization of the tacit and explicit knowledge held by individuals and organizations (Nonaka 1994). As a result, good HRM practices should motivate employees to build up a sound organizational system. We therefore hypothesize that:

Hypothesis 3: A higher rating of HRM practices predicts a higher degree of organizational capital.

Most scholars agree that human capital yields economic value for the organization (e.g., Hitt et al. 2001). According to Kaplan and Norton (1992), an organization's survival depends on the employee's innovative capability. It is the human capital, the carrier and creator of knowledge within the firms, which helps improve business processes for better strategic and operational effectiveness (Hitt et al. 2001). The resource-based view of organization theory signifies a new way of appraising human capital; that is, the capital that engages in knowledge innovation and knowledge creation is particularly valuable in enhancing organizational competitiveness (Lado and Wilson 1994; Teece et al. 1997; Argote, Ingram, Levine and Moreland 2000).

Although human capital is a major component of a company's intellectual capital, its interaction with relational capital generates more opportunities for exchanging resources, which in turn enhance problem-solving and innovation capabilities (Adler and Kwon 2002) and lead to increases in the company's wealth (Hitt and Ireland 2002; Minbaeva et al. 2003). In addition, qualified and preeminent workers will coordinate among themselves to benefit the organization (Pennings, Lee and Witteloostuijn 1998), thus accumulating internal relational capital. Lepak and Snell (1999) underscored the finding that human capital is enhanced through relational capital. Therefore, effectively designed and integrated relationships enable members to collaborate in ways that contribute to creating and using competitive advantages (Hitt and Ireland 2002). The positive impact of intellectual capital on firm performance can also be observed when human capital facilitates enterprises in improving business processes for better strategic and operational effectiveness while retaining organizational core competencies, thereby accumulating organizational capital (Becker 1964; Kaplan and Norton 1992). The three capitals should be integrated to bring out the best results. The effective management of these intangible assets yields higher financial results per employee (Roos et al. 2004). Therefore, we hypothesize that:

Hypothesis 4: A higher degree of overall intellectual capital predicts better organizational performance.

Bae and Lawler (2000) found that, although the HRM system is not the only determinant of a firm's performance, it is an important one. Their study indicated that people and HRM are emerging as critical sources of sustaining an organization's competitive advantage. Although previous studies discovered that sophisticated human resource planning, recruitment and selection, and training are associated with both high labour productivity and organizational performance (Koch and McGrath 1996; Terpstra and Rozell 1993; Youndt et al. 1996), the relationship is not as strong as expected (Bhattacharya et al. 2005; Collins and Clark 2003; Roos et al. 2004). Huselid and associates (1997), in particular, found no significant impact of technical HRM (including recruitment, selection, training, performance appraisal, and compensation administration) on firm performance.

As a result, scholars began to sort out possible explanations. Collins and Clark (2003) reported that HR practices lead to higher firm performance through the external and internal social networks of top management teams. Youndt and Snell's (2004) study based

on a multi-industry survey of 208 organizations indicates that different HR activities are related to three distinct forms of intellectual capital – human, social, and organizational – which, in turn, are related to organizational performance. They therefore introduce intellectual capital as a mediating construct to frame more effectively how HR systems drive organizational performance. However, they adopt an HR configuration perspective and propose a total of six different types of HR configurations with two each corresponding to human capital, social capital, and organizational capital, respectively. Although different from this study, Youndt and Snell's (2004) study justified the value of examining intellectual capital as the mediator.

To sum up, we would argue that to improve organizational performance it is essential to have effective functional HRM practices through accumulating human, relational, and organizational capital by reinforcing and complementing each other as a coherent system. We therefore hypothesize that,

Hypothesis 5: Intellectual capital mediates the relationship between HRM practices and organizational performance.

Research context

In today's healthcare sector, patients are becoming well-informed through multiple channels of communication, such as the internet, help lines, and personal channels (Morath 2003; Scott 2003). Many patients capitalize on the available knowledge and are transformed from passive care receivers to consumers who take an active role in their care, which results in an increase of demand for productivity and innovation and causes major challenges to healthcare providers (Herzlinger 2002).

Over the past few decades the healthcare industry in Taiwan has been prospering considerably. With more and more public hospitals privatized and the entry of corporate sponsored hospitals into the field, the healthcare industry in Taiwan has become a free competition market which exerts great pressure for a more effective hospital management. Since a hospital is a service organization, its intangible assets, including the quality of doctors, nurses, administrators, organizational culture, and service systems, are key factors that generally determine its overall success or failure. Consequently, as human resources are the carriers of these intangible assets, HRM practices play a pivotal role in facilitating the competitiveness of a hospital. The healthcare industry in Taiwan provides an appropriate context for studying this topic.

Methods

Sample and data collection

A questionnaire survey was employed to collect data for our field of interest. The questionnaire was distributed to the human resource managers of all 493 hospitals in Taiwan with 277 responses, a response rate of 56%. Among the responding hospitals: 26% have less than 400 employees; 16% between 401 and 800 employees; 26% between 801 and 1200 employees; 17% between 1201 and 1600 employees; and the remaining 15% have over 1600 employees. About 17% of the hospitals have a history of less than 10 years, 41% between 10 and 30 years, and the remaining 42% over 30 years.

Measurement

The survey items were formulated from a literature review and informal field interviews of HR professionals in hospitals, and were then reviewed by independent HR managers and a

college HR lecturer with over 20 years of HR experience in a hospital. Since this is an organizational level study, the items listed in the appendix were answered by HR managers representing the perspective of their hospitals.

For *organizational performance*, we adopted a multi-faceted approach as Schuler and Jackson (2005) suggest. In Taiwan, public performance statistics are lacking and most hospitals regard organizational performance as confidential and are reluctant to reveal any such data in a highly competitive market. In a study of nursing homes in Canada, Rondeau and Wagar (2001) found that the use of perceptual measures is frequently the only available assessment for comparative purposes across a large sample of organizations. They used subjective organizational effectiveness measures to examine the relationship between HRM practices and performance with three categories of dependent variables: employee outcomes; customer/client outcomes; and facility performance outcomes. Following their path, our dependent variables included overall employee satisfaction and turnover rate (employee outcomes), patient loyalty (customer outcomes), and quality of medical service and management effectiveness (facility performance outcomes). The question items are based on a literature review and expert opinion.

For *HRM practices*, we used 14 items to cover recruiting and selection, training and development, performance appraisal, compensation, and health and safety mainly based on the literature of Huselid (1995), Lepak and Snell (1999), Bontis and Fitz-enz (2002), Huang et al. (2002), Minbaeva et al. (2003), Rutherford et al. (2003), Roos et al. (2004), and Geiger and Cashen (2007). For *intellectual capital*, we used 11 items to cover human capital, relational capital, and organizational mainly based on the literature of Lado and Wilson (1994), Nonaka (1994), Nahapiet and Ghoshal (1998), Pennings et al. (1998), Bontis (1999), Argote et al. (2000), Hitt et al. (2001), and Kang and associates (2007). Please refer to the appendix for question items. The demographic information includes type of hospital (medical center, regional hospital, and community hospital), total employee numbers, and number of years each hospital has been in existence.

Analysis and results

To test the proposed relationships, we used LISREL that provides an overall assessment of both the fit of the hypothesized measurement model and the structural model (Joreskog and Sorbom 2001). The hypothesized model is depicted in Figure 1. Following Anderson and Gerbing's (1988) suggestion, the models were tested using a two-stage structural equation model. First, a confirmatory factor analysis (CFA) was performed to test construct validity regarding convergent and discriminate validity of measurement models. Then, path analysis was performed to test the research hypotheses empirically. Because the sample size is relatively small for estimating all parameters in the full CFA model, separate CFAs were conducted (Chiou, Hsieh and Yang 2004.)

Measurement model

For the measurement model of five HRM practices, convergent validity was confirmed as the factor loadings are larger than .60 and t-value greater than 2. Discriminate validity using plus and minus two standard errors not including 1 has also been confirmed (Smith and Barclay 1997; Joreskog and Sorbom 2001). The result justified the appropriateness to regard five HRM practices as separate factors, although some correlations were relatively high, ranging from .35 to .78. However, it is understandable that since HRM practices comprise a system of organizational values, HRM tends to focus on efficient selection,

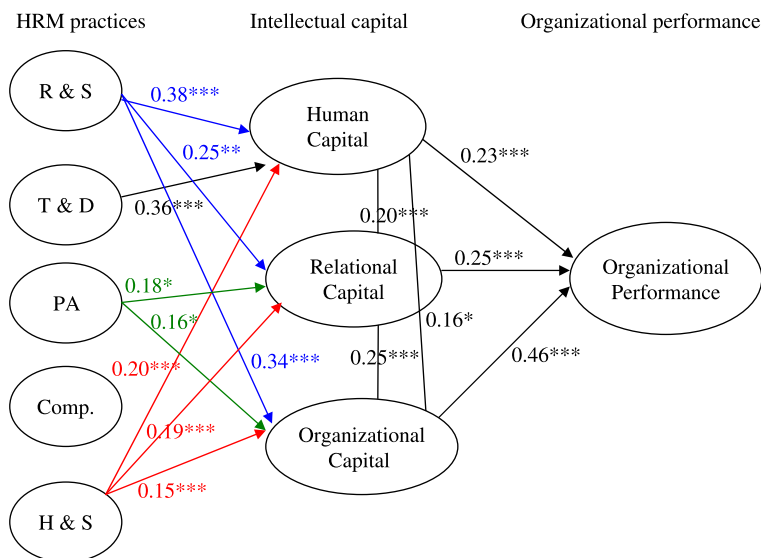


Figure 1. Path coefficients for the hypothesized model.

training and development, and performance appraisal at the same time, thus resulting in a high correlation between the practices. For the measurement model of five HRM practices, Goodness of Fit Index (GFI) = 0.91, Comparative Fit Index (CFI) = 0.95, and Root Mean Square Error of Approximation (RMSEA) = 0.080 indicate good fits as fit indexes at or above .90 are acceptable (Medsker, Williams and Holahan 1994).

For the measurement model of intellectual capital, its convergent validity and discriminate validity were also confirmed using the above mentioned analyses. The result also justified the appropriateness to regard human capital, relational capital, and organizational capital as separate factors, although the correlations range from .62 to .72. Again, it is understandable that an organization which values intellectual capital tends to pay attention to all three types of capital, thus resulting in a high correlation between them. For the measurement model of intellectual capital, Goodness of Fit Index (GFI) = 0.91, Comparative Fit Index (CFI) = 0.95, and Root Mean Square Error of Approximation (RMSEA) = 0.081 also indicate good fits. For the measurement model of organizational performance, Goodness of Fit Index (GFI) = 0.97, Comparative Fit Index (CFI) = 0.98, and Root Mean Square Error of Approximation (RMSEA) = 0.056 represent good fits. Cronbach's alpha coefficients of the inspected factors range from .82 to .90. Means, standard deviations and correlations are shown in Table 1.

The path model and hypothesis testing

With the above indices, the tested measurement models are valid for further analysis. We then assessed overall fit of the structural model and found the index of fit to be satisfactory, GFI = .95 and CFI = .97 as exhibited in Figure 1.

To further confirm the mediating effects of intellectual capital, we conducted a Sobel (1982) test and found that human capital, relational capital, and organizational capital indeed mediate the relationship between the HRM practices and organizational performance with the p values ranging from .03 to .001. The results indicate that the five HRM practices contributed to the accumulation of human capital, relational capital,

Table 1. Mean, standard deviation and correlation table.

	<i>Mean</i>	<i>s.d.</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>
1. Recruiting & selection	3.54	.75	1								
2. Training & development	3.44	.81	.69	1							
3. Performance appraisal	3.19	.75	.78	.69	1						
4. Compensation	3.31	.82	.66	.64	.70	1					
5. Health & safety	3.86	.80	.58	.35	.54	.53	1				
6. Human capital	3.57	.68	.71	.66	.62	.53	.51	1			
7. Relational capital	3.62	.77	.68	.57	.64	.51	.54	.62	1		
8. Organizational capital	3.58	.81	.79	.57	.72	.60	.63	.68	.72	1	
9. Organizational performance	3.49	.68	.80	.63	.72	.68	.65	.70	.72	.79	1

Note: All the correlation coefficients are significant at the .001 level.

and organizational capital, and that these three types of capital significantly explain organizational performance. In addition, HRM practices can better explain organizational performance through human, relational, and organizational capital accumulation. That is, the linkage of HRM practices – intellectual capital – organizational performance is empirically confirmed.

To answer our first research question of ‘What HRM practices can best explain intellectual capital?’, Figure 1 shows that two practices – recruiting and selection, and health and safety – explain all three types of capital to a significant degree, with recruiting and selection having a stronger predicting power. Performance appraisal explains both relational capital and organizational capital. Training and development only explains human capital. Compensation does not have any effect on the three types of capital. In sum, Hypothesis 1, Hypothesis 2, and Hypothesis 3 are partially accepted.

To answer the second research question ‘Does intellectual capital explain organizational performance?’ Figure 1 indicates that indeed the three types of capital significantly explain organizational performance. In particular, organizational capital has almost two times the predicting power that human capital and relational capital do. In other words, to achieve expected organizational performance, organizations need to pay more attention to the transformation of HRM practices into an effective business model, effective management process and systems. Therefore, Hypothesis 4 is accepted.

The numbers in Figure 1 and the Sobel test answer our third research question, ‘Does intellectual capital mediate the relationship between HRM practices and organizational performance?’ The mediating role of intellectual capital is confirmed and therefore Hypothesis 5 is accepted.

Furthermore, Figure 1 also shows the interaction effects among the three types of capital. The coefficients between human capital–relational capital, relational capital–organizational capital, and human capital–organizational capital are .20, .25, and .16, respectively. Since organizational capital has the most significant effect on organizational performance, its higher coefficient with relational capital has some implications for HR managers to contemplate.

Discussion and implications

As mentioned in the earlier part of this paper, our research framework follows the logic of ‘what is done – HRM practices’, ‘what is – intellectual capital’, and ‘what happens – organizational performance’ and examines their linkages. Data analysis using a LISREL measurement model, a structural model, and the Sobel test confirm that HRM practices contribute to the accumulation of intellectual capital, and that intellectual capital mediates the relationship between HRM practices and organizational performance.

From the HR manager’s point of view, organizations need to pay special attention to recruiting and selection, training and development, and health and safety in order to achieve a higher degree of human capital. Of particular note, the first two practices are more important with a coefficient of .38 and .36, respectively. In practice, recruiting and selecting capable employees with needed knowledge and skills, and then developing them to possess difficult to imitate and unique core competencies should be emphasized. In addition, creating a healthy and safe working environment is also very important to retain qualified human resources in the healthcare industry.

To enhance internal relational capital that increases employees’ mutual trust, their ability to collaborate with each other and builds up capabilities through increased interaction, the HR department should implement good programmes for recruiting and

selection, performance appraisal, and health and safety. Recruiting and selection has a higher predicting power with a coefficient of .25. In practice, recruiting and selecting employees with appropriate personality and team spirit to facilitate horizontal interactions and a well-designed performance appraisal system to encourage vertical interactions through frequent performance feedbacks are desirable. In addition, providing a healthy and safe working environment is also helpful in enhancing internal relational capital accumulation, as employees will have an atmosphere that supports collaboration in a hazard free working environment.

For a higher degree of organizational capital, recruiting and selection, performance appraisal, and health and safety should be more highly prioritized. To reiterate, recruiting and selection has the greatest predicting power with a coefficient of .34. In practice, measures that recruit and select employees who respect organizational culture, strategy, structure, system, process, and knowledge management can be carefully designed. In addition, a performance appraisal system that clearly conveys organizational values can be enforced. Furthermore, providing a healthy and safe working environment is a process directly related to organizational strategy, structure, and system in the healthcare industry and should be particularly emphasized.

To gain a clearer picture about the relative importance of each HRM practice on organizational performance through the mediation of the three types of capital, we have calculated the weighted percentage of each HRM practice, using the following formula, for example:

Recruiting and selection weighted percentage: (please refer to the numbers in Figure 1).

$$.38 \times .23(\text{HC}) + .25 \times .25(\text{RC}) + .34 \times .46(\text{OC}) = 30.63\%$$

HC = human capital, RC = relational capital, OC = organizational capital

Such a calculation shows the weighted influence of HRM practices as recruiting and selection to be 30.63%, health and safety 16.25%, performance appraisal 11.86%, and training and development 8.28%. The implication of this finding for HR managers in the healthcare industry is that in order to achieve a multi-faceted organizational performance, recruiting and selection, a healthy and safe working environment, and good performance appraisal are the three most important practices that need to be implemented. Unexpectedly, recruiting and selection turns out to be the HRM practice that exerts the greatest influence on organizational performance in this study. Yet, this result agrees with Lin and Wei's (2005) finding that organizations in Taiwan focus more on recruiting and selection than training and development, with the rationale that by hiring the right person with the right personality and the right attitude, they will perform and conduct self-learning on a continuous basis.

Theoretically, this study empirically confirms the mediating role of intellectual capital between functional HRM practices and organizational performance, and in so doing provides another dimension for researchers to examine the effect of HRM practices. Although Hitt et al's work (2001) provides an empirical support for the direct and moderating effects of human capital on firm performance, their research confines to human capital only. Youndt and Snell's (2004) study confirms the mediation effect of three distinct forms of intellectual capital – human, social, and organizational on organizational performance. Yet, they examine a total of six different types of HR configurations (e.g., acquisition HR, developmental HR, and egalitarian HR) with two each corresponding to human capital, social capital, and organizational capital respectively. In comparison, the major theoretical contribution of this study is the identification of intellectual capital as a

holistic 'intangible' system that reflects the effect of the widely practiced 'intangible' HRM practices, and thus more convincingly links functional HRM practices with organizational performance as a significant mediator.

Another theoretical contribution is the manifested effect of HRM practices on organizational capital accumulation and the importance of organizational capital in explaining organizational performance. As mentioned earlier that HR managers are beginning to be viewed as human capital asset managers and as potential sources of competitive advantage (Wright and Snell 1991; Lepak and Snell 2003; Schuler and Jackson 2005), valuable resources HRM practices can generate for the organization in collaboration with other functional operations should be recognized. For instance, the HRM department can help the information technology (IT) department define the right employee qualification (e.g., the often neglected emotional intelligence or team spirit) for the IT new recruit in order to effectively run the knowledge management system, which leads to a higher degree of organizational capital. Studies on the interactions of HRM and functional departments may open another avenue for HRM researchers, especially organizational capital has been identified as the most important intangible asset that explains organizational performance. In addition, the research finding provides a direct test of the resource-based view that different HRM practices, namely recruiting and selection, health and safety, performance appraisal, and training and development exert different levels of influence on human capital, relational capital, and organizational capital accumulation suggests a complex resource-strategy contingency fit. The proven impact of health and safety on the organizational performance of hospitals further testifies the resource contingency effect.

In practice, the weighted percentage reported in this paper provides both a research method and a guideline for HR practitioners to effectively allocate rare and valuable company resources, in responding to Huselid's call for technical HRM effectiveness. Huselid et al. (1997) suggested that in contexts where technical HRM effectiveness is low among competitors, improvements in this domain may be a means to gain competitive advantage. Our research result has uncovered a clear path of what to emphasize and how to achieve HRM effectiveness in the healthcare industry where the impact of HRM practices have attracted less attention in the past.

In addition, viewing the crucial role organizational capital plays in explaining organizational performance, efforts should be directed to building a sound infrastructure that enables organizations to create, accumulate, and recreate organizational capital. Furthermore, with the significant interactions of the three types of capital, HR managers should specifically endeavour to capitalize on internal relational capital for the purpose of augmenting organizational capital.

Counter-intuitively, compensation turns out to have no effect on intellectual capital in explaining organizational performance, which posits an interesting topic for future research. A possible explanation is that this set of data reflects the perspective of HR managers. In Taiwan, HR managers generally are members of an HR association in their particular industry, where they interact with their fellow professionals for purposes of information sharing and knowledge advancement. With their informal survey of annual salary figures, employee compensation usually has a relatively fixed market price and does not vary significantly from organization to organization, which may attenuate its predicting power.

Limitations and future research

Several limitations suggest that any conclusions drawn from this research should be viewed with some caution. First, our measures of organizational performance reflect the

subjective assessments of HR managers. Although a number of scholars claim that perceptual assessments of performance are strongly associated with more objective ones, they are still subject to the inherent biases, preferences, and perceptual distortions of assessors.

Second, this study utilizes the self-developed measurement which may need further refinement. However, in answering our research questions at the present stage, we are confident in this measurement for the following reasons. First, as functional HRM practices have become institutionalized over the years (Huselid 1995; Huselid et al. 1997), related question items are very straightforward; second, the selected question items are based on a literature review and modified by experienced HR managers; third, its convergent validity and discriminate validity have been confirmed by LISREL analysis with good fits; and fourth, Cronbach's alpha coefficients of the inspected factors are pretty good, ranging from .82 to .90.

Third, because it is a single source organizational data, common method bias may be a problem. However, we have tried our best to reduce this bias through the following measures. First, we have been able to expand the number of organizational respondents (Rondeau and Wagar 2001) with a 56% response rate through a convincing covering letter and an easy to answer questionnaire; second, we have designed a multi-faceted organizational performance items, including employee outcomes, customer outcomes, and facility performance outcomes (Rondeau and Wagar 2001; Schuler and Jackson 2005); third, we referred to suggestions proposed by Spector and Fox (2003) and have included items which asked more fact-based, focused, and more specific questions to minimize the subjective bias; and fourth, we have arranged the sequencing of the question items to prevent respondents from providing systematically biased answers.

Future studies may benefit from collecting objective organizational performance data in other industries where public ROA and/or ROI can be obtained to further test this model. The impact of compensation on intellectual capital can be further explored. Investigating the effect of strategic HRM on organizational performance mediated by intellectual capital should also prove valuable. A future longitudinal study may also be conducted to examine the time lag effect of intellectual capital accumulation and organizational performance. In addition, a cross-cultural comparison will definitely benefit this field of study.

Conclusion

To expand the existing human resource concept, intellectual capital research allows us to move the HRM focus to a more holistic knowledge-based approach to utilize a company's precious intangible assets (Davis 2006). The outcome of this research has provided a guideline for calculating the weighted influence of HRM practices on organizational performance and uncovered the relative importance of three different types of capital to organizational performance. Due to their limited resources, organizations should create and store key elements of intellectual capital, in tandem with effective HRM practices, to achieve an 'extendibility' of their resources (Prahalad and Hamel 1990). HRM then becomes the key facilitating force that helps a company attain its goal.

In a hyper competition era, success in business is no longer achieved through healthy financial statements or by having the most innovative product; it is achieved through people. Virtually any type of management problem, in the final analysis, either is created by people or must be solved by people; hence, having the right people in the right place at the right time emerges as the key to a company's economic growth (Neghandi 1987). In the

global knowledge-intensive economy, HRM plays an increasing important role in strategizing people management and collaborating with other functional departments for maximizing organizational competitive advantage. Particularly, HRM can assist companies to sustain their competitive position by offering competitors a 'moving target' that is difficult to emulate by investing in building intangible intellectual capital, including human capital, relational capital, and organizational capital, through various HRM practices.

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Appendix

Question items: HRM practices

Recruitment and selection

1. The recruitment and selection system of our hospital enables us to hire good employees.
2. The recruitment and selection process of our hospital is effective.
3. The employees we hire achieve a good person–job fit.

Training and development

1. Our hospital has an effective training and development system.
2. The performance of our training and development is high.

Performance appraisal

1. Our hospital completes employees' performance appraisals in a timely fashion.
2. Our supervisors always provide performance appraisal feedback to their subordinates.
3. Our employees are satisfied with our performance appraisal system.

Compensation

1. Our hospital has a well-implemented salary system.
2. Our hospital has a well-implemented benefit system.
3. Our retirement plan and compensation plan for a bereaved family are well implemented.

Health and safety

1. Our hospital provides a safe working environment.
2. The sanitation of our hospital is good.
3. Our hospital has a low working injury rate.

Intellectual capital***Human capital***

1. The qualifications of our human resources are the best among all our competitors.
2. Our employees are experts in their jobs.
3. Our employees are skilful in their jobs.
4. Our employees continuously acquire new job-related knowledge.

Relational capital (internal)

1. Our employees trust each other with open communication.
2. Our employees enhance their capabilities through interactions.
3. Our employees discover and solve problems through mutual collaboration.

Organizational capital

1. Our top management team regards employees as the source of value creation.
2. An effective business model and values are embedded in our organizational culture.
3. Our hospital has an effective management process.
4. Our hospital has a full range of handbooks and a complete knowledge management system for employees' easy reference.

Organizational performance

1. Our employees have high job satisfaction.
2. Our hospital has a low turnover rate.
3. Our patient loyalty is high.
4. Our hospital management is effective.
5. The medical skills and medical service of our hospital is above the industry average.