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High performance work systems and corporate performance: the influence of entrepreneurial orientation and organizational learning

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Abstract

This study investigates the functioning mechanisms of how high performance work systems (HPWS) affect organizational performance. We propose that (HPWS) can positively affect organizational performance through the mediating role of entrepreneurial orientation. An organization with high performance work systems can perform better if it enjoys high level of organizational learning. We design and administer a survey questionnaire to high-level executives or founders of companies from manufacturing and service industries and receive 176 valid responses. The results of the empirical data indicate that the relationship between high performance work systems and corporate performance is more positive when organizational learning is stronger. Entrepreneurial orientation partially mediates the relationship between high performance work systems and organizational performance. This study opens new research avenues by extending and incorporating explanations and predictions of HPWS and entrepreneurial orientation, two areas that largely have been considered independently of each other. Implications for practice and directions for future research are provided.

Keywords: High performance work systems, Entrepreneurial orientation, Organizational learning, Corporate performance

Introduction

Considering employees as a key source of competitive advantage, strategic human resource management is gaining increasing importance in knowledge-based economies and rapidly changing environments (Prieto and Santana 2012; Sun et al. 2007). As valuable, rare and inimitable assets for organizations because of their firm-specific, socially complex and path-dependent characteristics, human resource practices help firms obtain sustainable competitive advantages (Collins and Clark 2003). Among the broad concepts of strategic human resources, high performance work systems stand out as reflecting the basic philosophy and practices of strategic human resource management and shape the attitudes, skills and behaviors of staff by discovering and utilizing knowledge, thereby achieving organizational goals (Chen 2009; Collins and Clark 2003).

High performance work systems (HPWS) have been extensively discussed despite their brief history. As there is no agreement on the definition of this concept, it can

generally be regarded as an organic combination of a series of coordinating and cooperating human resource management practices in order to enhance individual and organizational performance (Snell and Bohlander 2010). By breaking the traditional hierarchical management model, HPWS use flat organizational structures to provide staff with wide-ranging training, safe environments, management and competitive compensation, organizational identification and productivity, which lead to sustainable competitive advantages and long-term individual and organizational development (Pak and Kim 2016).

Research on HPWS includes both organizational level and individual level studies. At the organizational level, scholars have verified the causal relationship between HPWS and corporate performance (Becker and Huselid 2006; Shin and Konrad 2017). At the individual level, empirical studies suggest HPWS can improve personal performance such as job satisfaction, service quality, organizational citizenship behavior and information sharing (Cheng and Wang 2011; Sun et al. 2007). However, the extant literature on the intermediate linkage between HPWS and performance has yielded only limited insights into the influence of the use of HPWS on performance at the organizational level (e.g., Lee and Bang 2012). As argued by Laursen and Foss (2003), the understanding of the relationship between HPWS and corporate performance needs to be extended. What is missing from the resource-based view is looking inside the process to explore how and why HPWS enhance corporate performance (Way and Johnson 2005; Wei and Lau 2010).

Given the essential role of HPWS in performance, it is especially important to examine specific pathways through which this effect occurs. It is assumed that the implementation of HPWS can improve the level of innovation and organizational commitment, and therefore promote entrepreneurial orientation (Gittell et al. 2009; Herrmann and Felfe 2014). With innovation, risk-taking and proactiveness, companies are more inclined to expand markets, launch new products and make decisions ahead of competitors, thus improving corporate performance (Hunt and Arnett 2006; Messersmith and Wales 2013). Therefore, the extant literature suggests that entrepreneurial orientation can be a bridge between HPWS and corporate performance. However, although scholars in the field of entrepreneurship agree that human resource management practices are antecedents to entrepreneurial orientation (De Kok and Den Hartog 2006; Schuler 1986), the consensus is largely based on conceptual work which lacks comprehensive empirical tests (Schmelter et al. 2010). In the few existing empirical analyses, there are conflicting results. Despite positive results between entrepreneurial orientation and corporate performance (Gupta and Batra 2016; Rauch et al. 2009; Thanos et al. 2016), some empirical research has found no significant relationship or inverted U-shaped relation between them (Messersmith and Wales 2013; Tang et al. 2008; Wales et al. 2013). These confusing results require deeper and more holistic perspectives of the function of entrepreneurial orientation.

Furthermore, successful implementation of HPWS is restricted by the absorptive ability of the organization. Specifically, the absorptive ability takes the form of organizational learning, through which an organization captures, transfers and shares knowledge to improve its operation and optimizes the organizational structure in order to achieve long-term development (Hassan and Alhakim 2011; Sanzo et al. 2012). Through organizational learning, employees can gain knowledge, strategize creative

ideas and improve job autonomy. However, companies cannot easily spread knowledge among staff to achieve organizational goals as knowledge is embedded in human capital. High levels of organizational learning may be needed to ensure the effective implementation of HPWS. Corporations with higher levels of organizational learning can more effectively put high performance work systems into effect and bring their positive effects on corporate performance into full play (Fu et al. 2015). Consequently, organizational learning may influence the relationship between HPWS and corporate performance.

This study aims to explore the functioning mechanism of entrepreneurial orientation and organizational learning in the HPWS-performance link. It is believed that corporate performance provides feedback on HPWS in the form of information and this feedback generates both the data and the slack resources needed to support the adaptive process of HPWS implementation (Shin and Konrad 2017). In line with the resource-based view (Barney 1991) and organizational learning literature, we propose that organizational learning can be the moderator in the link between HPWS and corporate performance. When organizational learning is stronger, this link can be more positive. Entrepreneurial orientation positively mediates this relationship. The theoretical model is illustrated in Fig. 1.

By proposing this theoretical framework, this study contributes to literature development in several aspects. First, it further explores the mediating and moderating mechanisms between HPWS and corporate performance. To break the limitation of the "black box", this study employs mature scales to test relevant constructs. Second, we innovatively introduce entrepreneurial orientation as the mediator in the model, attempting to further reveal the relationship among HPWS, entrepreneurial orientation and corporate performance and expand the concept of entrepreneurship to some extent. Third, it enriches the study of organizational learning by investigating its moderating role in the HPWS and corporate performance link.

In the following parts, we develop hypotheses through briefly reviewing the literature on HPWS, entrepreneurial orientation and organizational learning. Then, the methodology for the study is introduced. We empirically analyze the data and draw conclusions. Implications and limitations are discussed in the last section.

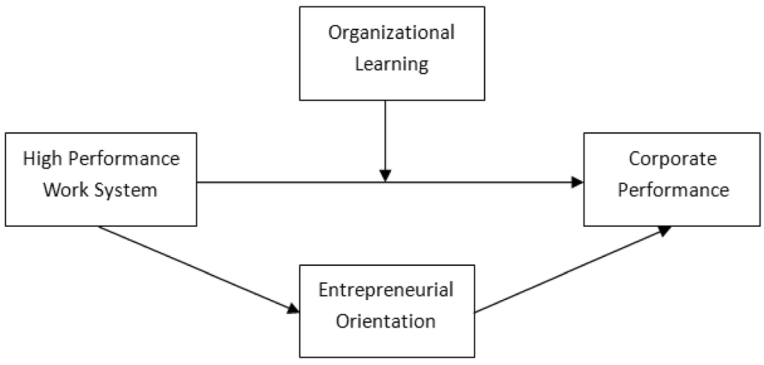

Fig. 1 Theoretical Framework

Literature review and hypotheses development

High performance work systems

The concept of HPWS, also called high involvement work systems, best human resource management practices and high commitment work systems, was first described by Huselid (1995). However, as a relatively new concept, the definition of high performance work systems has not yet reached a consensus among scholars (Takeuchi et al. 2007). Generally speaking, HPWS refers to a set of HR practices aimed at enhancing staff skills, commitment and productivity, thereby transferring human capital into a source of sustainable competitive advantage (Pak and Kim 2016).

Key dimensions of HPWS include selective hiring procedures, employment security, decentralization of decision making, extensive training, information sharing, and fair payment (Pfeffer 1998). Each dimension of human resource practices is closely related and mutually coordinated. A set of research studies has tested the respective influence of each dimension (Schmelter et al. 2010). However, a meta-analysis of Chinese firms suggests HPWS, rather than a single human resource management practice, has a significantly positive influence on corporate performance, and an even stronger influence on non-financial performance (Zhang et al. 2012).

From different perspectives, researchers have explored the significance of HPWS. More specifically, there are at least three streams of research on HPWS. From the strategic development perspective, the first stream emphasizes the match of HPWS and corporate strategy, focusing on its consistency with the outside factors. As Huselid (1995) said, HPWS originates from and serves corporate strategy. The match between HPWS and corporate strategy and among different human resource management practices are highly valued. The second stream regards HPWS as systems that include a series of coordinated and compatible human resource management practices, emphasizing the accordance of internal issues (Datta and Wright 2005; Pfeffer 1996). From a systematic perspective, HPWS is one of the sources from which firms can obtain sustainable competitive advantages. The third one suggests that effective implementation of HPWS requires the participation of employees (Edwards and Wright 2001; Guthrie 2001). Different from the general employer-employee relationship, HPWS is helpful to establish a community of employee participation, commitment and authorization at the individual level. We consider HPWS to be an organic system which consists of related human resource management practices, including strict recruiting procedures, broad training processes, information sharing, work design, inside promotion channels, employee authorization and performance-based payment. Through the implementation of HPWS, the probability of employee participation is improved, thus high-quality human capital is sustained.

Over the past two decades, studies on HPWS have come under pressure to illustrate their contribution to organizational performance (Batt and Colvin 2011; Hayton 2005; Messersmith and Guthrie 2010). At the organizational level, HPWS is considered to break the traditional hierarchical management mode and establish a flat organizational structure. The managerial practices provide employees with safe working environments, offer broad training projects and opportunities to participate in decision-making, competitive payment and transparent communication channels. From the perspective of the resource-based view, when different human resource management practices are integrated into a synergic system and embedded in an organization, the system will be

heterogeneous, socially complicated and inimitable. Therefore, the system can contribute to organizational performance such as firm productivity and innovativeness, thereby helping the organization obtain sustained competitive advantages and enhance performance (Becker and Huselid 2006).

On the other hand, HPWS are also considered as tools to control the attitudes and behaviors of employees through providing supportive working environments at the individual level (Links et al. 2013; Shi and Li 2011). Employees are considered the key carrier of HPWS (Zhu and Chen 2014). On the basis of the social exchange literature, HPWS can formulate an exchange relationship between an organization and employees and bring more return for the organization (Xiao and Björkman 2006). Through skill training, career planning and knowledge improvement, employees can feel the support of their organization and a strong sense of identity with their position. Consequently, HPWS enhances organizational commitment and relationships among employees, and subsequently influences the attitude and behavior of employees (Gittell et al. 2009). In return, employees provide positive feedback and supportive social behaviors to the organization (Bashir et al. 2012; Khazanchi and Masterson 2011). Therefore, with investment in employees in the long term, HPWS improves the level of organizational commitment, thereby enhancing the improvement of the organization (Ehrnrooth and Björkman 2012; Kinnie et al. 2000).

Prior studies have illustrated the positive relationships between HPWS and corporate performance. Therefore, scholars have called for researchers to dive deeper to reveal the effect mechanism of HPWS on corporate performance (Way and Johnson 2005; Wei and Lau 2010).

High performance work systems and entrepreneurial orientation

The concept of entrepreneurial orientation originates from the strategy decision mode set out by Miles et al. (1978). Entrepreneurial orientation can be viewed as a mind pattern of an organization that reflects entrepreneurial attitudes and willingness when starting new businesses (Covin and Slevin 1989; Hu and Zhang 2011). It is a key element of organizational culture and can be reflected in activities such as daily operations and in decision-making processes.

Miller and Friesen (1982) first proposed that entrepreneurial orientation contained three dimensions, namely innovativeness, proactiveness and risk-taking. Innovativeness refers to the tendency to search for novel and new ideas to solve challenges (Morris et al. 2002). Risk-taking is defined as entering into a costly commitment with uncertain outcomes (Pearce et al. 2010). Proactiveness refers to the exploitation of first-mover advantages and anticipation of future events (Lumpkin and Dess 1996). The three-dimensional approach has gradually been accepted by most researchers in this field.

Whether an organization has an entrepreneurial orientation or not rests in the entrepreneurial spirit of its employees. Therefore, it is especially important for companies to encourage employees to build entrepreneurial spirit. Through systematic managerial practices such as skill training, information sharing, involvement in decision-making processes and authorization, companies influence entrepreneurial behaviors and therefore improve the level of organizational entrepreneurial orientation (Schuler 1986; Zhu and Chen 2014). Specifically, we argue that strategic human resource management, namely

high performance work systems, can improve organizational entrepreneurial orientation, for the following reasons.

First, the large scale of investment in employees can improve their specialized knowledge and work-related skills, thus organizational human capital is enlarged (Youndt et al. 1996). As human capital drives the level of innovation and knowledge and skills are essential sources of innovation (Amabile et al. 1996; Wiersema and Bantel 1992), organizational entrepreneurial orientation can consequently be improved.

Second, practices such as autonomy and participation in decision-making processes encourage employees to break through current problem-solving patterns, search for entrepreneurial opportunities and take risks to try new approaches to get higher returns (Li et al., 2010; Wiklund and Shepherd 2005). Accumulated knowledge and risk-taking propensity can interact with each other and together facilitate entrepreneurial orientation.

Third, high performance work systems encourage the dimension of proactiveness because after employees obtain new knowledge, they will hope to use the knowledge to keep pace with current market trends. If they take actions ahead of competitors, they are more likely to gain first-mover advantages such as building relationships with customers and establishing distribution channels (Hughes and Morgan 2007; Wiklund and Shepherd 2005). Therefore, high performance work systems can accelerate proactive behaviors.

Furthermore, the implementation of HPWS creates an organizational innovative atmosphere through guiding and controlling the attitudes and behaviors of employees, consequently enhancing the level of organizational commitment and therefore improving innovation levels (Gittell et al. 2009; Herrmann and Felfe 2014). Specifically, through practices such as authorization, involvement in decision-making and payment share, employees can control work processes, have more autonomy to make decisions and cooperate better with teammates. Motivated to share weal and woe with firms (Lee and Bang 2012), employees become more loyal, hence organization commitment is improved. Therefore, employees are more inclined to innovate, take risks and generate new ideas (De Kok and Den Hartog 2006; Herrmann and Felfe 2014). In short, building the organizational atmosphere to encourage innovation, HPWS can improve the level of entrepreneurial orientation of the organization.

However, although theoretically demonstrated, few studies have empirically tested the effect of HPWS on firms' overall entrepreneurial orientation (Hayton 2005). In order to clarify the relationship between HPWS and entrepreneurial orientation, we assume that organizations can increase human capital and build an innovative atmosphere through a series of valid human resource management practices, thereby having a positive effect on organizational entrepreneurial orientation. Thus, Hypothesis 1 is stated as follows:

Hypothesis 1: High performance work systems have a positive effect on entrepreneurial orientation.

Entrepreneurial orientation and corporate performance

The essential function of entrepreneurial orientation in the performance of companies has been discussed extensively in the field of entrepreneurship (Wiklund 1999;

Wiklund and Shepherd 2005). Companies with an entrepreneurial orientation are considered to have the ability to discover and exploit market opportunities ahead of their competitors (Lee et al. 2001; Wiklund and Shepherd 2003). However, previous research has shown confusing conclusions in the relationship between entrepreneurial orientation and corporate performance. Although plenty of empirical results show that firms with a higher level of entrepreneurial orientation often perform better than their counterparts (Clercq et al. 2010; Thanos et al. 2016; Wiklund and Shepherd 2005; Zahra and Covin 2015), some researchers find no positive relationship. For example, Runyan et al. (2008) point out the positive EO-performance relationship can be only confirmed in the growth stage rather than in later periods. Tang et al. (2008) suggest an inverted U-shape relationship between entrepreneurial orientation and corporate performance in the Chinese context. Messersmith and Wales (2013) suggest that EO-performance is not straightforward.

Complex results in the EO-performance relationship require deeper exploration and a more holistic perspective. The relationship between entrepreneurial orientation and corporate performance may be influenced by, among others, corporate culture, organizational structure, and/or external environment (Walter et al. 2006). This suggests the effect mechanism of entrepreneurial orientation should be put into a contingent condition, including environmental variables (complexity, dynamism and industrial cycle) and organizational variables (firm resources, organizational structure, etc.) (Covin and Slevin 1989; Lumpkin and Dess 1996). Therefore, we argue that when the external environment and internal organizational policies both encourage innovation and entrepreneurship, entrepreneurial orientation is positively related to organizational performance. Specifically, Chinese firms are facing fast environmental change in the economic transition period. In order to keep pace with emerging trends, companies need to start new businesses, create knowledge and break through current thinking patterns. Also, the Chinese government has implemented a series of policies to encourage entrepreneurial practices. Therefore, we assume a positive relationship between entrepreneurial orientation and corporate performance in this research.

As stated above, organizations with a higher level of entrepreneurial orientation express stronger inclinations towards innovativeness, willingness to take risks and proactiveness. These dimensions of entrepreneurial orientation improve the capabilities of the company. Firstly, the dimension of innovativeness encourages companies to update managerial methods, improve manufacturing modes, expand new markets and launch new products and services. In this way, organizations continuously improve efficiency and effectiveness and enhance abilities. These abilities are valuable and inimitable, because they are rooted in the organizational context and are thus difficult to be transplanted or imitated (Hunt and Arnett 2006; Nonaka 1994).

Companies' risk-taking behaviors can influence entrepreneurial choices (Dew et al. 2009). Entrepreneurs should consider potential loss when investing in new businesses (Miller 2007). The risk-taking dimension can be viewed as the willingness to take risks, break current approaches and explore potential opportunities to gain higher returns (Li et al. 2010; Wiklund and Shepherd 2005). Therefore, the risk-taking dimension helps firms improve the possibility of higher payback.

Timely actions are especially important when firms are faced with fluctuating environments. Proactiveness can help firms gain first-mover advantages (Hughes and

Morgan 2007). With perspective and strategic foresight, companies tend to become first movers and achieve advantageous market positions such as brand popularity, distribution channels and high profits (Hunt and Arnett 2006; Lee et al. 2001; Wiklund and Shepherd 2005). Furthermore, companies with proactiveness are more likely to build intimate relationships with their suppliers and customers, which can provide vital resources and information (Marino et al. 2002; Messersmith and Wales 2013). Therefore, these firms can keep their market positions ahead of rivals and improve corporate performance.

Based on this analysis, we argue that the three dimensions of entrepreneurial orientation can enhance firm performance in different ways. Therefore, we propose that in a dynamic and changing environment, entrepreneurial orientation can benefit organizational outcomes. Hypothesis 2 is stated as follows:

Hypothesis 2: Entrepreneurial orientation is positively related to corporate performance.

The intermediary role of entrepreneurial orientation

Successful implementation of HPWS is vital to the improvement of corporate performance. However, despite much discussion about the financial and non-financial results HPWS can bring, the internal effect mechanism has not yet been clarified (Laursen and Foss 2003). Some researchers suggest that the relationship between HPWS and corporate performance may be more complicated than a single main effect (Way and Johnson 2005; Wei and Lau 2010). This call requires scholars to investigate thoroughly the potential mediating effect in the relationship between HPWS and corporate performance.

According to the aforementioned analysis, HPWS integrates single human resource practices into a synergic system, which is deeply embedded inside the organization. A resource-based view suggests these systems are heterogeneous, inimitable and valuable, and thus help organizations achieve sustained competitive advantages (Becker and Huselid 2006). Through the process of social exchange, the investment in human capital improves employees' perception of organizational support, thus enhancing the level of organizational commitment (Gittell et al. 2009). In return, employees display more supportive social behaviors and subsequently improve the overall performance of the organization (Ehrnrooth and Björkman 2012; Xiao and Björkman 2006).

More specifically, through strict recruiting procedures, scientific training systems, transparent promotion channels, and open information sharing, the investment in employees enlarges human capital and provides staff with knowledge and work-related skills, which are essential sources of innovation (Youndt et al. 1996). At the same time, through authorization and involvement in decision-making processes, HPWS enhances organizational commitment and creates an organizational atmosphere that encourages innovative behaviors (De Kok and Den Hartog 2006; Herrmann and Felfe 2014). In other words, with the implementation of HPWS, employees acquire greater control of their work, feel more loyal to their companies, and therefore become more incentivized to optimize their working methods, generate new ideas and take risks. Consequently, the company's overall innovation and the risk-taking level is improved (Herrmann and Felfe 2014). Since entrepreneurial orientation is a driving factor in firms' innovation (Wang et al. 2015), it might be a basic managerial approach to support and facilitate

HPWS. With stronger inclinations towards innovativeness, risk-taking and proactiveness, companies tend to continuously improve managerial methods, update manufacturing technologies, take risks to launch new products and become first movers to achieve advantageous market positions (Hunt and Arnett 2006; Lee et al. 2001; Wiklund and Shepherd 2005). Therefore, companies with stronger entrepreneurial orientations are more likely to act ahead of their competitors and outperform counterparts (Clercq et al. 2010; Thanos et al. 2016).

As stated in Hypothesis 1 and Hypothesis 2, entrepreneurial orientation links the relationship between HPWS and corporate performance, which indicates the indirect effect mechanism of HPWS on corporate performance. Hence, we argue that HPWS is an antecedent of entrepreneurial orientation and may contribute to a firm's performance. In other words, HPWS help promote corporate performance by raising the corporate entrepreneurial orientation level. Based on this discussion of HPWS, entrepreneurial orientation and corporate performance, we propose Hypothesis 3 in the following statement:

Hypothesis 3: Entrepreneurial orientation mediates the relationship between high performance work systems and corporate performance.

The moderating role of organizational learning

Organizational learning was first accepted as a process through which organizations find and correct mistakes and reconstruct their knowledge base (Argyris and Schön 1997). Over the past few decades, scholars have constantly enriched and deepened the literature in this field. At present, organizational learning can be regarded as a "dynamic process of creating, acquiring and integrating knowledge to develop resources and capabilities that will enable the organization to achieve better performance" (Hassan and Alhakim 2011; Sanzo et al. 2012). A firm's ability to extract lessons from both successes and failures and generate new insights is conducive to performance (Senge 1990; Wang 2008). Therefore, organizational learning is widely considered as the most influential factor in firm success, and the ability to learn faster than competitors may be the only source of sustainable competitive advantage (Dickson 1992).

From the process perspective, sub-processes of organizational learning include training, information gathering, interpretation, retaining, transferring, and organizational memory (Argote 2012; Liu and Ko 2012). From a knowledge-searching and innovation perspective, organizational learning can be classified into exploitation learning and exploration learning, and balancing them helps organizations adapt to changing environments and gain competitive advantage (Kane and Alavi 2007; Lee and Huang 2012; March 1991). Empirical results show that organizational learning is positively related to financial and non-financial performance (Dibella et al. 1996; Goh et al. 2012; Luxmi 2014) and becomes a long-term influential mechanism in firms (Jiang et al. 2014).

With organizational learning in place, HPWS can be effectively implemented to improve corporate performance. As organizational learning includes training, information gathering, interpretation, retaining, transferring, and organizational memory (Argote 2012; Liu and Ko 2012), HPWS can be understood by employees and be easily instilled into their

mindsets. They will take the initiative to absorb, learn and share knowledge, apply knowledge to their work and create new ideas (Fu et al. 2015).

This effective learning process enables organizations to quickly grasp, transfer, spread knowledge among employees and make it internalized in organizations. As these actions are valuable, rare and inimitable, organizations can obtain competitive advantages, adapt to dynamic environments and thus outperform their competitors. In this way, organizational structure can be improved and managerial practices can be better felt, absorbed and used, thus improving corporate performance. In contrast, when organizational learning is neglected, an organization can neither capture knowledge nor encourage employees to participate in the implementation of HPWS. The effect of HPWS on corporate performance will be weakened (Liao and Wu 2010).

Therefore, we suggest that when organizations have strong learning capabilities, HPWS will be more effectively implemented, hence corporate performance can be improved. Accordingly, we have developed Hypothesis 4:

Hypothesis 4: The relationship between high performance work systems and corporate performance is more positive when organizational learning is stronger.

Methods

Sample and data collection

The data for this study were gathered by surveying CEOs, presidents, or other top executives from firms in the manufacturing or service industries using 5-point Likert Scales. To ensure the reliability and validity of the study, we adopted mature research scales to test key variables. As all scales were originally in English, we translated them into Chinese and back-translated them to ensure the accuracy of the scales. In order to avoid unnecessary ambiguity in meaning, we randomly selected executives and carefully explained each item to them. According to the feedback, we slightly adjusted inappropriate items, added more fact-based questions (Chang et al. 2010), cut some questions into short and clear sentences to improve cognitive effort and weaken the possibility of transient mood states such as boredom (Lindell and Whitney 2001).

Two groups of founders, partners, or top executives of companies took part in executive training courses at a university. One group was present in mid-October and the other group in early November, 2017. We obtained the participants' background information, such as their names, company names and their positions because one of the researchers was involved in teaching a 2-day class with each group. This enabled us to conduct an initial screening to exclude those who worked in non-business organizations or who were not in key executive positions in companies and identify the ideal respondents to answer the questionnaire.

The researchers asked the qualified candidates to participate in this study without providing any incentives. We communicated with them face-to-face about the purposes and content of this research and provided detailed on-site instruction on how to answer the questionnaire. We encouraged them to invite their friends who were either founders or top executives of other companies to participate in this survey.

The researcher also held seminars on the research topic for three different executive gatherings and distributed the questionnaire among them. For all those who participated

in this survey, we not only assured them of the confidentiality and anonymity of their responses, preventing their answers from being interfered by social expectations (Podsakoff et al. 2003), but also promised to share with them the findings of this research.

We took a number of steps to minimize the effects of common method variance (Ambos et al. 2013; Lindell and Whitney 2001; Podsakoff et al. 2003). First, we improved the scale items by using multiple item constructs and different scale formats. Second, we rearranged the order of the survey items. Third, each respondent was required to ask another executive who was in charge of finance in the same company to fill in the performance part.

We distributed more than 450 questionnaires in total from early September to mid-November, 2017. These efforts finally yielded 212 responses. After deleting those with missing values or incomplete answers, we finally obtained 176 valid responses from 134 firms. The effective response rate was 39.11%. We compared the mean and standard deviation of some key variables such as firm size, firm location and the industry of the 134 firms with those of the sampled 450 firms and did not find significant differences.

Of the sampled enterprises, 59.2% have a history of more than 10 years. The longer the history is, the more attention will be paid to the construction of the HR management system. The data from these enterprises improves the reliability of the survey. As for ownership type, 18.4% are state-owned companies, 71.14% are privately owned companies and the rest are foreign companies or joint ventures. 26.87% of the firms are publicly listed and 73.13% are not listed firms. Among all the firms that participated in the survey, 61.36% are in the manufacturing industry and 38.64% are in the service industry.

Variable measures

High performance work systems (HPWS)

Although the measurement of HPWS has not reached a consensus among scholars, most scales share some common points: work design, promotion mechanism, skill training, level of employee commitment, communication, motivation, etc. (Appelbaum et al. 2000; Pfeffer 1996; Posthuma et al. 2013). Since the strategic human resource management literature suggests HPWS take effect as a whole (Delaney and Huselid 1996), in this study we regard HPWS as a single dimension concept and discuss its relations with other variables. We adopt the scale designed by Su (2010), which contains the common points of most scales. Sample items include "There is a standardized training system inside the company"; "This company offers key talents competitive payments" etc.

Entrepreneurial orientation

This study uses the 9-item measurement of entrepreneurial orientation proposed by Covin and Slevin (1989). The scale consists of three dimensions: innovation, proactiveness and risk-taking. Many studies have confirmed its usefulness and accuracy in different situations (Hansen et al. 2009; Kreiser et al. 2002). The 'Covin scale' has been verified in more than 20,000 enterprises and 7 different cultural background contexts. As well, to be consistent with Stam and Elfring (2015), we treat entrepreneurial orientation as a whole concept to explore its influence on HPWS and corporate performance. Sample survey items are as follows: "In the last 3 years, there are many changes of the

products and services of the company"; "In general, this company emphasizes research, technology and innovation" etc.

Organizational learning

Researchers have designed different scales to explain organizational learning from different perspectives. We adopt the scale developed by March (1991), which consists of 10 items. Sample items include: "Our aim was to search for information to refine common methods and ideas in solving problems in the project"; "We preferred to collect information with no identifiable strategic market needs to ensure experimentation in the project" etc.

Corporate performance

In this research, corporate performance is measured by the growth of sales, growth of assets, growth of market valuation, and growth of net profits by comparing this year's data with those in the previous year.

We did not use absolute financial data because some companies were reluctant to report them. We knew from private conversations with some executives that their major concerns with disclosing financial data were the possible influences on their public offerings in IPOs. Others also had some concerns about taxes. Besides, some companies had strict regulations for disclosing data.

Therefore, instead of absolute data, a comparison of this year's absolute financial data with that in the previous year is used to enable us to capture the growth of the company. This calculation is based on the objective financial data within 2 years.

Control variables

Firm size is controlled as large firms are more likely to establish HPWS due to scale (Datta and Wright 2005). The number of employees (log transformed) is used to represent firm size. In addition, industry category (0 for manufacturing and 1 for service) is controlled because growth patterns differed in different industries (Datta and Wright 2005; Guthrie 2001). Following the research of Guthrie (2001), we also treat ownership type, firm age, listed or not as control variables.

Analysis and results

Test of reliability and validity

Analysis of reliability is to verify the stability and consistency of the measurement result. In empirical studies, Cronbach's alpha analysis is widely applied to measure the inner stability and consistency of the Likert Scale. Generally speaking, the α value of Cronbach should be higher than 0.7, and it proves very strong reliability when the α value is higher than 0.9, see Table 1.

As is shown in Table 1, the Cronbach's α for HPWS, organizational learning and corporate performance are all above 0.9, which reflects strong reliability. The Cronbach's α value of entrepreneurial orientation is 0.809, which also reflects a high level of reliability.

This study aims to explore the relationship between HPWS and corporate performance. Therein entrepreneurial orientation and organizational learning are considered to be single dimensional. The widely used method for validity analysis is factor analysis. To test whether the items suit exploratory factor analysis, we apply the KMO method

Table 1 Construct Reliability

Concept	Number of subjects	Cronbach's *a* Coefficient
High Performance Work Systems	25	0.948
Entrepreneurial Orientation	9	0.809
Organizational Learning	10	0.922
Corporate Performance	4	0.902

and Barlett's sphericity test. Generally, when the KMO value is above 0.7, factor analysis can be used.

Table 2 shows that KMO values of HPWS and organizational learning are above 0.9. The KMO value of entrepreneurial orientation and corporate performance is higher than 0.8. Furthermore, the effect of Barlett's sphericity is significant. The results meet the requirement of exploratory factor analysis. The accumulative explained variances are respectively 66.948, 61.917, 59.127, 77.445%, which suggests the construct validity of the model is high.

We use the average variance extracted (AVE) to assess the main variables. Results show that the AVE value of high performance work systems, entrepreneurial orientation, organizational learning, and corporate performance are 0.650, 0.722, 0.692 and 0.774 respectively. All AVE values are above 0.5, which indicates the high convergent validity of the variables.

In order to confirm constructs discriminant validity, we use AMOS 22.0 to conduct confirmatory factor analysis. Results are shown in Table 3. We compare the four-factor model with a three-factor model, a two-factor model and a single-factor model. Typically, if $\chi^2/df < 5$, IFI > 0.9, CFI > 0.9, RMSEA< 0.08, the variables have high discriminant validity. Results show that the four-factor model has the highest model fit ($\chi^2(48) = 87.334$, IFI = 0.977, CFI = 0.977, RMSEA = 0.068).

Descriptive statistics and correlations

Before regression analysis, we carry out descriptive statistics analysis and correlation analysis. As Table 4 shows, the mean value of HPWS is 3.75, which suggests sampled enterprises attach importance to HR management. The average value of entrepreneurial orientation is 3.13, which indicates that the enterprises also care for their innovation capability, risk affordability and prospective improvement. Organizational learning and corporate performance are also above average. Further, the Spearman correlation coefficient matrix shows a significant positive correlation among variables, which provides a good basis for regression analysis.

In order to check the collinearity of variables, we calculate the variance inflation factor (VIF) value of the independent variables. Results show that the VIF values of

Table 2 Construct Validity

Constructs	KMO Value	Barlett Sphericity Test	Accumulative Explained Variances
High Performance Work Systems	0.917	0.000	66.948%
Entrepreneurial Orientation	0.802	0.000	61.917%
Organizational Learning	0.907	0.000	59.127%
Corporate Performance	0.818	0.000	77.445%

Table 3 Confirmatory Factor Analysis

Model	χ^2	*df*	χ^2/df	IFI	CFI	RMSEA
Four-factor model: HPWS, EO, OL, CP	87.334	48	1.819	0.977	0.977	0.068
Three-factor model: HPWS, EO + CP, OL	324.072	51	6.354	0.841	0.839	0.175
Three-factor model: HPWS, EO + OL, CP	265.757	51	5.211	0.875	0.873	0.155
Three-factor model: HPWS+EO, OL, CP	285.036	51	5.589	0.864	0.862	0.162
Two-factor model: HPWS+OL, EO + CP	592.977	53	11.188	0.686	0.681	0.241
Single-factor model: HPWS+OL + EO + CP	816.311	54	15.117	0.556	0.550	0.284

HPWS high performance work systems; *EO* entrepreneurial orientation; *OL* organizational learning; *CP* corporate performance; *IFI* incremental fit index; *CFI* the comparative fit index; *RMSEA* root-mean-square error of approximation

HPWS, EO and OL are 1.688, 1.763 and 1.503 respectively, which indicates that the degree of multi-collinearity of variables is low.

Regression analysis

The hypotheses tests should include three parts: the main effect, the mediating effect and the moderating effect.

Firstly we put in control variables to create Model 1 and then add independent variable HPWS to formulate Model 2. As illustrated in Table 5, after taking HPWS into consideration, the explanatory power of Model 2 is significantly improved with $\triangle F = 7.333$ and $P < 0.001$. Hence HPWS has a significantly positive relationship with corporate performance.

According to Baron and Kenny (1986), four prerequisites are needed for the verification of mediation effects: (1) positive effects of HPWS on corporate performance; (2) positive effects of HPWS on entrepreneurial orientation; (3) positive effects of entrepreneurial orientation on corporate performance; (4) taking entrepreneurial orientation into consideration, if the positive relationship between HPWS and corporate performance is dropped, entrepreneurial orientation has partial mediating effects. If the effect of HPWS on corporate performance becomes no longer significant, it suggests the full mediating role of entrepreneurial orientation.

Following the above instructions, we test the mediation effects of entrepreneurial orientation in the HPWS-performance relationship. Results are shown in Table 5.

Table 4 Descriptive Statistics, Reliability Coefficients and Correlation Matrix ($N = 176$)

Variable	average	S.D.	1	2	3	4	5	6	7	8	9
1. *Firm size*	5.48	2.26	1								
2. *Industry Type*	0.39	0.49	−0.191*	1							
3. *Listed*	1.72	0.45	−0.545**	0.163*	1						
4. *Firm age*	2.49	1.06	0.572**	−0.106	−0.457**	1					
5.*Ownership*	1.93	0.55	0.015	−0.369**	−0.124	−0.059	1				
6. *HPWS*	3.75	0.66	0.058	0.013	−0.207**	−0.085	0.147	1			
7. *EO*	3.14	0.66	0.012	0.003	−0.066	−0.267**	0.114	0.450*	1		
8. *OL*	3.89	0.69	0.036	0.050	−0.193*	−0.117	0.026	0.594**	0.490*	1	
9. *CP*	3.67	0.77	0.273**	−0.020	−0.387**	0.095	0.092	0.496**	0.350**	0.326**	1

HPWS high-performance work systems; *EO* entrepreneurial orientation; *OL* organizational learning
*$p < 0.05$; **$p < 0.01$ (two-tailed tests)

Table 5 Regression Results: HPWS, Entrepreneurial Orientation and Corporate Performance (Hypotheses 1, 2 & 3)

DV	Corporate Performance				Entrepreneurial Orientation	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Firm size	0.061	0.054	0.042	0.045	0.053	0.045
Industry type	0.125	0.080	0.102	0.077	0.065	0.013
Listed	−0.627***	− 0.436**	−0.538***	− 0.424**	−0.242	− 0.058
Firm age	−0.120*	− 0.058	−0.020	− 0.016	−0.273***	− 0.204**
Ownership	0.088	0.012	0.051	0.004	0.099	0.041
HPWS		0.496***		0.413***		0.402***
EO			0.365***	0.206*		
F	7.500***	14.833***	10.253***	13.967***	5.475***	10.350***
Δ*F*	–	7.333***	2.753***	3.714***	–	4.875***
R^2	0.181	0.348	0.267	0.371	0.139	`0.271
Δ R^2	–	0.167	0.086	0.104	–	0.132
Mean *VIF*	1.46	1.44	1.46	1.49	1.46	1.44

HPWS High performance work systems; *EO* Entrepreneurial orientation
*$p < 0.05$; **$p < 0.01$ (two-tailed tests)

Step one: the relationship between HPWS and corporate performance. As shown in the previous section, HPWS have a positive influence on corporate performance. The first precondition is fulfilled.

Step two: the relationship between HPWS and entrepreneurial orientation. In Model 5 we regard entrepreneurial orientation as a dependent variable and put in control variables. Then we add HPWS as an independent variable to create Model 6. The explanatory power of Model 6 increases significantly as ΔF equals 4.875, $P < 0.001$. The β index of HPWS towards entrepreneurial orientation is 0.402 ($P < 0.001$) and ΔR^2 equals 0.132, which shows that HPWS has positive effects on entrepreneurial orientation. Hypothesis 1 is confirmed.

Step three: the relationship between entrepreneurial orientation and corporate performance. In Model 3 we regard corporate performance as the dependent variable and add control variables and then put in entrepreneurial orientation as the independent variable. Taking entrepreneurial orientation into consideration, $\Delta F = 2.753$, ($P < 0.001$), $\Delta R^2 = 0.086$, which indicates that entrepreneurial orientation has a positive effect on corporate performance. This result support Hypothesis 2.

Step four: the mediating effect of entrepreneurial orientation between HPWS and corporate performance. We add corporate performance, HPWS, entrepreneurial orientation and control variables to get Model 4. After adding the mediating variable into the model, $\Delta F = 3.714$, $P < 0.001$. However, the β index between HPWS and Firm performance declined from 0.496 ($P < 0.001$) to 0.413 ($P < 0.001$), which indicates the correlation between HPWS and corporate performance is weakened. As discussed above, entrepreneurial orientation acts as a partial mediating variable between HPWS and corporate performance. Hypothesis 3 is therefore partially supported.

The process to test the moderating effect of organizational learning should include three steps (Baron and Kenny 1986): (1) test the effect of HPWS and organizational learning on corporate performance to get $R1^2$; (2) build the product term of HPWS and organizational learning and then perform regression analysis including corporate

performance, HPWS, organizational learning and their product-term to get $R2^2$; (3) compare the value of $R2^2$ with the value of $R1^2$. The greater value of $R2^2$ suggests the moderating effect of organizational learning in the relationship between HPWS and corporate performance.

We firstly standardize the independent variable and moderating variable, then get the interaction term by multiplying the standardized HPWS with organizational learning. Last, we perform a regression for these variables. Results are presented in Table 6.

To verify the independent effect of HPWS and organizational learning, control variables are inputted into Model 7. Then we add HPWS and organizational learning in Model 8. R^2 is 0.181 in Model 7. After taking independent and moderating variables into consideration, R^2 is lifted to 0.348. The explanatory power is obviously strengthened ($\Delta F = 5.149$, $p < 0.001$). After we introduce the interaction term in Model 9, in which R^2 equals 0.366, the explanatory power is obviously increased too ($\Delta F = 4.383$, $p < 0.001$). Since R^2 of Model 9 is greater than R^2 of Model 8, we conclude that organizational learning can positively moderate the relationship between HPWS and corporate performance. The different moderating effects of organizational learning at high and low levels are illustrated in Fig. 2.

Robustness check

In order to check the robustness of our results, we also use another measurement of corporate performance. We synthesize the performance scales designed by Dyer and Reeves (1995), Cheng and Zhao (2011). Sample items are as follows: "Compared to the two main competitors, the return on assets of our firm is high". "Compared to the two main competitors, the market share of our firm is high". This scale includes 6 items, asking the participants to compare their company's performance with those of their two main competitors in the industry. Since industry usually has a huge impact on a

Table 6 Moderating Effect Regression Results (Hypothesis 4)

Corporate Performance			
	Model 7	Model 8	Model 9
Firm size	0.061	0.054	0.059
Industry type	0.125	0.079	0.117
Listed	−0.627***	−.432**	−0.406
Firm age	−0.120*	−0.056	− 0.063
Ownership	0.088	0.014	0.035
HPWS		0.484***	0.459***
OL		0.020	0.024
*HPWS*OL*		0.210*	
R^2	0.181	0.348 0.366	
Δ R^2	–	0.167 0.185	
F	7.500***	12.649***	11.883**
Δ*F*	–	5.149***	4.383***
Mean *VIF*	1.46	1.55	1.50

HPWS High performance work systems; *OL* organizational learning
*$p < 0.05$; **$p < 0.01$ (two-tailed tests)

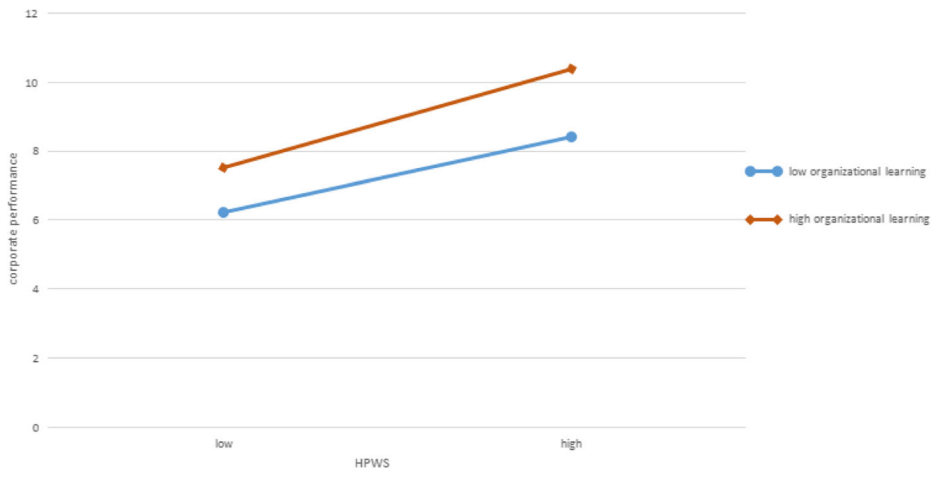

Fig. 2 Moderating Effect of Organizational Learning

focal company, it is reasonable to compare the performance level to the average level of an industry. Empirical results support all the hypotheses.

Discussion

Conclusions

This study explores the relationship between HPWS and corporate performance and the effect mechanism of HPWS. Through the empirical data analysis, we come to the following conclusions:

First, our empirical evidence shows HPWS can be regarded as an antecedent variable of entrepreneurial orientation. Through a series of managerial methods, organizations can improve the level of innovativeness, risk-taking inclination and proactiveness. Therefore, the companies constantly update manufacturing skills, grasp market opportunities and create new ideas and products, and thus outperform their competitors.

Second, we find that entrepreneurial orientation can positively influence corporate performance. Companies with a higher level of entrepreneurial orientation tend to update managerial patterns, launch new products, answer to market changes quickly and adjust strategic decisions ahead of competitors. Therefore, these companies can obtain competitive advantages and improve corporate performance.

Third, our work reveals that entrepreneurial orientation partially mediates the relationship between HPWS and corporate performance. This indicates the indirect effect mechanism of HPWS on corporate performance. HPWS helps promote corporate performance by raising the corporate entrepreneurial orientation level. The improved entrepreneurial orientation can further enhance firm performance.

Finally, we find that organizational learning positively moderates the relationship between HPWS and corporate performance. When an organization has a high level of learning capability, employees will acquire, utilize and share knowledge more actively. In this way, HPWS can be more effectively implemented. In contrast, a lower level of organizational learning will weaken the effect of HPWS on corporate performance.

Theoretical Contributions

This research contributes to the theoretical developments in the following way. First, by answering the calls of previous studies (Laursen & Foss, 2003; Lee & Bang, 2012), this paper explores the inherent effect mechanism of the HPWS-performance relationship at the organizational level. Prior studies have not clearly unraveled the effect process of HPWS on corporate performance (Way & Johnson, 2005; Wei & Lau, 2010). This work has extended our understanding of the relationship between HPWS and corporate performance and has dived deeper into the effect process, and therefore contributes to the theoretical development of human resource management.

Second, previous research focusing on the antecedents of entrepreneurial orientation have argued that human resource management practices can facilitate the level of organizational entrepreneurial spirit (De Kok & Den Hartog, 2006; Gittel et al., 2009; Herrmann & Felfe, 2014). However, these arguments are largely based on theoretical assumptions and lack empirical tests (Schmelter et al., 2010). This exploration is a beneficial supplement to entrepreneurship theory.

Third, past research (Gutpa & Batra, 2016; Rauch et al. 2009; Thanos, et al., 2016) has attached great importance to the EO-performance relationship and paid little attention to the mediation effect of entrepreneurial orientation between HPWS and corporate performance. This study has revealed that heavy investment in human capital can promote knowledge, innovation and cooperation of employees, therefore improving the level of organizational entrepreneurial orientation. Our study emphasizes the important role of organizational entrepreneurial spirit in organizational management and is a beneficial attempt to combine human resource management and entrepreneurship practices.

Finally, our findings reveal the moderating role in the research of organizational learning and are consistent with past research (e.g., Fu et al., 2015; Liao & Wu, 2010). The results shed light on the interaction effect of human resource practices and organizational learning practices.

Managerial implications

This research also has some practical implications. First, managers should attach importance to investment in human capital and introduce HPWS to improve corporate performance. Through strict recruiting procedures, specific training, clear career development plans, friendly job environments, authorization, information sharing and fair pay systems, companies can attract professional employees, enhance their knowledge and skills, and improve the level of their autonomy and commitment. Thus, employees are motivated to adjust their work to corporate strategy, create new ideas and take risks. A living company is therefore created.

Second, this study suggests entrepreneurial orientation can help companies find potential opportunities to expand markets and customers. As the accelerated process of marketization and social and economic transformation bring a series of opportunities and challenges, companies should improve the level of entrepreneurial orientation to enhance corporate value by adopting new technology and managerial methods, taking risks in dynamic environments and taking actions ahead of competitors.

Third, managers may combine HPWS and entrepreneurial orientation in order to enhance corporate performance, as this research has demonstrated so far. While HPWS emphasizes internal managerial practices, entrepreneurial orientation is more about the attitude towards the outside. Ideally, managers would combine and balance both approaches.

Finally, the successful implementation of HPWS is related to organizational learning. If companies pay no attention to organizational learning, HPWS would not be approved or effectively implemented, thus the promotion effect on corporate performance would be weakened. Firms should take organizational learning seriously, build internal knowledge systems, create learning atmospheres and encourage employees to explore, learn and share knowledge. Therefore, every managerial practice can be more efficiently and effectively implemented.

Limitations and further research

Despite the contributions of this study, there still remain some limitations, which may indicate avenues for future research. First, the sample resources can be improved. In this research, sample data is cross-sectional, which may not adequately reflect the causal relationship among variables. Future research can introduce panel data to avoid potential disadvantages. Second, the research level can be extended. This study explores the effect of HPWS on corporate performance at the organizational level. However, past research has found HPWS can also influence individual performance such as employee satisfaction, turnover rate, employee creativity, etc. Future studies may add employee performance as individual-level variables and adopt a hierarchical linear model to deeply explore the relationship between HPWS and corporate performance.

Abbreviations

CP: Corporate performance; EO: Entrepreneurial orientation; HPWS: High performance work system; OL: Organizational learning

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Competing interests

The authors declare that they have no competing interests.

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