HOW DOES EXECUTIVE STRATEGIC HUMAN RESOURCE MANAGEMENT LINK TO ORGANIZATIONAL AMBIDEXTERITY? AN EMPIRICAL EXAMINATION OF MANUFACTURING FIRMS IN CHINA

YANG CHEN, GUIYAO TANG, FANG LEE COOKE, AND JIAFEI JIN

Despite a plethora of studies that demonstrate the positive impact of strategic human resource management on firm performance, existing knowledge of the processes through which such gains can be achieved remains limited. This study aims to extend our knowledge by investigating the mechanism through which a teamwork-oriented executive strategic human resource management system impacts organizational ambidexterity. Specifically, by integrating the resource-based view and information-processing theory, we examine the mediating role of top management team effectiveness and the moderating role of knowledge–sharing intensity from middle managers to top management teams. Drawing on a multiple-source and multiple-respondent survey from 144 manufacturing firms in China, we show that top management team effectiveness partially mediates the effect of the executive strategic human resource management system on organizational ambidexterity. Moreover, knowledge-sharing intensity from middle managers to top management teams strengthens the effect of the executive strategic human resource management system on organizational ambidexterity.

Keywords: executive strategic HRM system, knowledge sharing, organizational ambidexterity, TMT effectiveness

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Human Resource Management, September–October 2016, Vol. 55, No. 5. Pp. 919–943

Published online in Wiley Online Library (wileyonlinelibrary.com).
DOI:10.1002/hrm.21797

Introduction

Research on the upper echelons of firms has long acknowledged the importance of top management team (TMT) functions and effectiveness on organizational behavior and outcomes (Song, Zhang, & Wu, 2014). This suggests that an executive-focused strategic human resource management (SHRM) system may exert an effect on firm outcomes. An executive SHRM system represents a set of teamwork-oriented HRM practices toward TMT executives, including recruitment and selection, team-level compensation, collaboration training, team performance appraisal, and teamwork climate building (Lin & Shih, 2008). Distinct from organization-wide SHRM systems, the executive SHRM system aims to improve team collaboration and effectiveness among strategic decision makers and thus produce widespread effects on firm strategic and financial results (Lin & Shih, 2008). The process through which the executive SHRM system impacts firm performance has received little research attention (take Lin & Shih, 2008, as an exception), despite its importance.

A recurring proposition in management literature is that successful organizations in a dynamic environment are ambidextrous (Gibson & Birkinshaw, 2004). An ambidextrous organization is one that is capable of both exploiting existing competencies (e.g., upgrading existing skills in product development, experiential refinement, and reuse of existing technology) and exploring new opportunities (e.g., acquiring new technology, skills, and innovation). Achieving ambidexterity enables an organization to enhance its performance and competitive advantage (Cao, Gedajlovic, & Zhang, 2009). A number of studies have concluded that organizational ambidexterity can be a means to competitiveness improvement, adaptation, and survival, and thus can serve as a proxy of firm performance (Cao et al., 2009; He & Wong, 2004; Junni, Sarala, Taras, & Tarba, 2013). However, organizational ambidexterity remains undertheorized, and its antecedents especially are poorly understood (Cao, Simsek, & Zhang, 2010; Patel, Messersmith, & Lepak, 2013). Based on the upper-echelon theory, some studies highlight the critical role of TMT in helping firms to achieve ambidexterity (e.g., Cao et al., 2010; Lubatkin, Simsek, Ling, & Veiga, 2006). This study treats the executive SHRM system as a critical antecedent (Junni, Sarala, Tarba, Liu, & Cooper, 2015; Patel et al., 2013) and analyzes the process through which the executive SHRM system impacts organizational ambidexterity.

Research argues that middle managers are important internal agents with substantial decision-making authority that might influence organizational processes underpinning firm performance (Wooldridge, Schmid, & Floyd, 2008). Organizational ambidexterity may challenge the professional and functional identity of middle managers who play a role in the implementation of strategies designed by TMTs to realize ambidexterity. Thus, consideration of both TMTs and middle managers is crucial to understanding how key internal agents may intervene in the process through which firms leverage their resources to enhance performance, in particular the process through which firms use their executive SHRM system to realize ambidexterity.

Our study seeks to address two research questions:

1. How does an executive SHRM system influence organizational ambidexterity?
2. Do middle-manager-related variables play an intervening role in the relationship between an executive SHRM system and organizational ambidexterity?

The study bridges the gaps in the current research on SHRM and organizational ambidexterity by building a conceptual model linking the executive SHRM system to TMT members and organizational ambidexterity. For the purpose of this study, we define organizational ambidexterity as *the organization's capacity to simultaneously exploit existing competencies and explore new opportunities across an entire business unit* (Cao et al., 2009; Gibson & Birkinshaw, 2004; Lubatkin et al., 2006). Drawing on extant literature on resource-based view (RBV) and information-processing theory (e.g., Lin & Shih, 2008; Wooldridge et al., 2008), our model posits two critical intervening mechanisms to help explain the linkage between the executive SHRM system and ambidexterity: TMT effectiveness and knowledge-sharing intensity from middle managers to TMTs. This study contributes to the SHRM literature by focusing on the HRM system at the TMT level and developing a theoretically grounded model that traces the path from the executive SHRM system to a firm's organizational ambidexterity by theorizing the mediating role of TMT effectiveness. By responding to the call for studies on the interface between TMTs and middle managers, this study further contributes to the management literature by highlighting the strategic and operational significance of middle managers for firms to achieve superior performance and investigating the moderating

role of knowledge-sharing intensity from middle managers to TMTs.

Theoretical Background and Hypotheses Development

Organizational Ambidexterity

Ambidexterity was used initially to describe the human trait of the ability of individuals to use both hands with equal skill or dexterity (Lubatkin et al., 2006). In parallel, organizational ambidexterity focuses on the ability of an organization to both efficiently exploit its existing competencies and explore innovativeness on products and/or services (Patel et al., 2013). While there is broad consensus in the literature that organizational ambidexterity is related to the simultaneous pursuit of exploratory and exploitative activities, there is little agreement about the conceptualization and operationalization of the ambidexterity construct (e.g., Cao et al., 2009; He & Wong, 2004; Lubatkin et al., 2006).

Some researchers (e.g., He & Wong, 2004) conceptualize organizational ambidexterity as an organization's effort to match or balance the magnitudes of exploitation and exploration (known as balanced ambidexterity; Cao et al., 2009). Exploitation and exploration are seen to compete against each other in that scarce resources and attention are divided to meet the needs of different goals and different administrative routines and managerial behaviors are involved. Despite these inherent contradictions, both activities need to be cultivated and balanced as a closer match of the two activities can contribute to firm performance through more structured control of performance risk (Cao et al., 2009). If such a balance is not achieved, firms will face the risk of either obsolescence or failure. Researchers (e.g., Patel et al., 2013) suggest that firms could achieve the necessary balance through structural methods of internal differentiation such as building separate organizational units tasked with dissimilar goals associated with these activities and creating temporal separation in the sequence of organizational activities. Firms could also employ appropriate HR practices to achieve HR flexibility so that employees have the discretion and motivation to engage in activities associated with both exploitation and exploration (Gibson & Birkinshaw, 2004).

Another school of thought holds that organizational ambidexterity involves a firm's effort to increase the combined (absolute) magnitude of exploitation and exploration (e.g., Gupta, Smith, & Shalley, 2006). Cao et al. (2009) call this *combined ambidexterity.* Researchers (e.g., Gupta et al., 2006) reason that explorative and exploitative activities may take place in complementary domains and are not necessarily in competition. Through explorative endeavors, firms could internalize more external resources and knowledge, which can be applied to support efficient routines and processes of exploitation, thus leveraging the effects of exploitation (Cao et al., 2009). In support of this view, Cao et al. (2009) contend that combined ambidexterity could lead to enhanced firm performance through generating complementary resources that could be leveraged across activities of exploitation and exploration. We contribute to this view by examining the idea that exploration and exploitation should be differentiated yet subsequently integrated to generate value (e.g., Cao et al., 2009; Gibson & Birkinshaw, 2004; Lubatkin et al., 2006). This approach allows us to uncover how ambidextrous organizations are able to successfully pursue exploration and exploitation through leveraging resources/knowledge and the one activity supporting the other.

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As key leaders in organizations, senior executives are regarded as critical in fostering organizational ambidexterity. Their role is manifested in TMT characteristics and processes. Studies have found that various TMT characteristics (such as TMT's skills, knowledge, and experiences) play different roles in enhancing organizational ambidexterity (e.g., Raisch & Birkinshaw, 2008). For example, Beckman (2006) finds that the founding team's composition, especially the TMT's prior company affiliations, is important in firms' paths to ambidexterity. Organizational ambidexterity can also be facilitated by the TMT's internal processes. Specifically, TMTs help their firms to achieve ambidexterity when they bring new competencies to units while using others' existing or well-developed competencies—for example, by shifting the firms' resources between existing products and innovations (Raisch & Birkinshaw, 2008). In support of this view, Smith and Tushman (2005) conclude that TMTs engage in activities (e.g., optimizing organizational forms and simplifying resource allocation processes) that enable firms to balance the strategic trade-offs between exploration and exploitation. In line with the above arguments, we expect, for the purpose of this study, that TMT effectiveness resulting from the appropriate characteristics and efficient processes of the TMT can

be considered a key contributor to a firm's organizational ambidexterity.

Resource-Based View of Executive SHRM Systems

Studies of HRM suggest that firms should design HRM policies and practices based on their business strategies as a strategic approach to people management (e.g., Martinez-del-Río, Céspedes-Lorente, & Carmona-Moreno, 2012). SHRM represents a set of strategy-aligned HRM practices in areas such as staffing (including recruiting and training), compensation systems (including performance appraisals and reward systems), and employee development programs (including empowerment and climate building). Informed by RBV that views people as valuable and inimitable assets that firms can utilize to achieve competitive advantages, researchers (e.g., Martinez-del-Río et al., 2012) conclude that organization-wide SHRM helps firms achieve superior organizational performance. However, critics have argued that studies searching for a direct relationship between SHRM and firm performance may not be productive (e.g., Wright, Dunford, & Snell, 2001). In response, a number of studies have focused on the underlying mechanisms through which SHRM practices may contribute to excellent performance (Becker & Huselid, 2006). Specifically, SHRM can enhance other business resources/capabilities that provide sustained competitive advantage to a firm (Becker & Huselid, 2006). For example, Takeuchi, Lepak, Wang, and Takeuchi (2007) find that as one kind of business resource, collective human capital of employees mediated the positive relationship between high-performance-oriented SHRM and firm performance. In addition, Wei and Lau (2010) conclude that firms' adaptive capability mediates the relationship between high-performance work system and firm performance. Therefore, identifying appropriate intervening mechanisms is key to a better understanding of how SHRM may improve firm performance.

Existing studies (e.g., Chang, Jia, Takeuchi, & Cai, 2014; Lin & Shih, 2008) have directed their attention to TMT-oriented SHRM practices since, as decision makers, TMT members formulate strategies that are aimed at improving firms' performance. Top executives are firms' critical human resources because they determine organizational policies, strategic processes, and resource allocation. TMTs define and shape the work context within which employees work together to define goals, problems, and solutions. By creating a vision that emphasizes long-term profit within their firms, TMTs can direct employees' efforts toward creative work processes and superior organizational outcomes (Martell & Carroll, 1995; Tang, Chen, & Jin, 2015). Moreover, top executives may create and sustain an organizational climate and a culture that nurture creative efforts and facilitate the diffusion of information learning, and thus can significantly improve firm performance (Smith, Collins, & Clark, 2005; Smith & Tushman, 2005). Given top managers' importance to firms' success, firms need to attract top talents to the TMT and appraise, train, and reward them effectively to create a cohesive team so that the strategic goals of their firms can be achieved. Despite the growing awareness of the importance of TMT on firm performance, little is known about how this group of executives should be treated from the SHRM perspective (Lin & Shih, 2008). Therefore, following the logic of Lin and Shih (2008), this study examines the impact of the executive SHRM system on organizational ambidexterity, which can be treated as an indicator of firm performance. Given the importance of TMT members in navigating the competitive landscape of firms, it is suggested that an executive SHRM system should be designed to directly target TMT members (Collins & Clark, 2003). Unlike some studies (e.g., Wright & Snell, 1998) that highlight the interplay between strategy and SHRM concerned, this study adopts the view of Collins and Clark (2003) and Lin and Shih (2008) by focusing on an executive SHRM system from a teamwork-oriented view instead of focusing on the content/type of firm strategy.

According to RBV, an executive SHRM system that is composed of interrelated teamwork-oriented SHRM practices toward TMT members is characterized by value and inimitability and can be regarded as a strategic resource for organizational ambidexterity for a firm. It can support TMT members' team-oriented skills and capabilities to pursue exploitation and exploration simultaneously. For example, by motivating top executives to determine how best to divide their time between concurrent demands for exploration and exploitation (Raisch & Birkinshaw, 2008), executive SHRM system can help these executives simultaneously improve the efficiency of existing innovation methods and acquire new technology (Patel et al., 2013). Through the selection and development programs, TMT members can be recruited with the best set of skills and teamwork experiences and be ensured to keep abreast of latest knowledge and technological advances for the demands for exploration and exploitation (Fu, Flood, Bosak, Rousseau, Morris, & O'Regan, 2015; Ahammad, Lee, Malul, & Shoham, 2015). An executive SHRM system could also motivate top executives to behave with integrity so that

their effectiveness on aspects such as idea development, solution generation, and decision making is improved. Thus, organizational ambidexterity can be promoted (Halevi, Carmeli, & Brueller, 2015). Accordingly, in this study, we investigate how an executive SHRM system may help achieve organizational ambidexterity by facilitating TMT-related behaviors such as TMT effectiveness (see Figure 1). We elaborate on the role of TMT effectiveness below.

The Mediating Role of TMT Effectiveness

TMT effectiveness has been identified as critical for a firm to achieve superior performance (De Hoogh & Den Hartog, 2008). In this study, we conceptualize TMT effectiveness as an organizational capability with strategic potential that stems from its rarity, value, and inimitability. Specifically, an effective TMT develops the characteristics of collective cognition, strategic consensus, and behavioral integration, all of which could improve a firm's capability to respond to changes in the market. TMT effectiveness involves various steps and processes to create a coherent entity as part of the firm's strategy formulation and implementation, making it difficult for competitors to discern which parts or processes are important (De Hoogh & Den Hartog, 2008). TMT effectiveness requires a firm's TMT to achieve a consensus of purpose and sequent behaviors, and not every TMT can do that. Thus, TMT effectiveness can be considered as a strategic capability that is valuable, rare, and difficult for competitors to imitate—and thereby fosters the firm's competiveness.

Previous studies have examined several antecedents of TMT effectiveness, including leader and structure, cultural difference, and strategic management (e.g., De Hoogh & Den Hartog, 2008). In this study, we propose a teamwork-oriented executive SHRM system as an important antecedent of TMT effectiveness on aspects such as consensus achievement on the goals and missions of their firms, effective decision making to enhance firm performance, and consistent work toward attaining the organizational goals (De Hoogh & Den Hartog, 2008). Generally speaking, an executive SHRM system (e.g., practices of selective recruiting and compensation packages) could mitigate conflicting interests and disagreement among TMT members, and thus a shared understanding of the goals and missions of their firms could possibly be achieved (Martinez-del-Río et al., 2012). Executive SHRM practices such as training and performance appraisal could also advance team capabilities, reduce team disputes, and enhance team cooperation (Lin & Shih, 2008), all of which could in turn enhance TMT members' abilities to work coherently as a team toward attaining their goals. Moreover, some aspects of the executive SHRM system, such as team climate building, could build trust and knowledge reciprocity and assimilate new and existing knowledge/resources (Lubatkin et al., 2006). These effects could also increase the efficiency of TMT members' involvement in strategic decisions. We outline below how an executive SHRM system can influence TMT effectiveness through the five dimensions of selective recruitment, training opportunities, performance appraisal systems, compensation package, and building team climate (Lin & Shih, 2008; Subramony, 2009).

First, extant studies suggest that the value of employees can be enhanced to benefit firm-level outcomes through practices such as recruiting excellent applicants and providing employees with job-relevant training (e.g., Martinez-del-Río et al., 2012). Similarly, we predict selective hiring of competent senior executives and further training and development may produce superior knowledge that ultimately improves TMT effectiveness (e.g., Martinez-del-Río et al., 2012). Specifically, selective staffing practices are constructed to lead to hiring executives who possess desired knowledge, abilities, and other characteristics, such as communication skills, teamwork ability, broad experiences, and global vision (Lin & Shih, 2008).

Second, training and development in an interactive manner (e.g., team-based problem solving, team trust building, and cross-functional team collaboration) is likely to promote the characteristics required by executives in their workplace

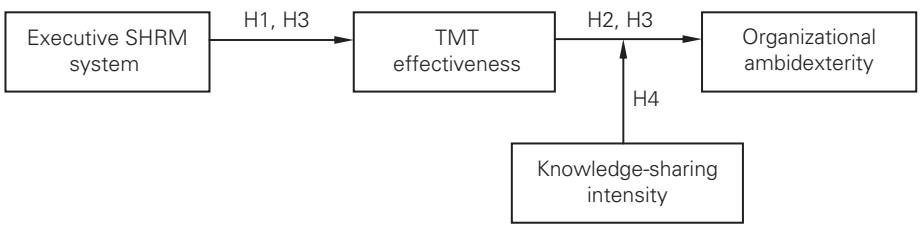

FIGURE 1. The Conceptual Model of the Study

(Kuvaas, Buch, & Dysvik, 2012). Training enables TMT members to work effectively by better understanding and sharing the firm's goal and mission, facilitating TMT trust, and enhancing TMT's collaboration, so that their involvement in decision-making processes becomes more effective.

Third, appropriate performance appraisals linked to rewards can help direct senior executives' effort toward accomplishing work objectives and provide them with the inducements necessary to collaborate with colleagues, share information with each other, increase TMT trust, and engage in high levels of TMT performance (Allen, Ericksen, & Collins, 2013). An effective performance appraisal system supports organizational expectations regarding TMT behavior so that ambiguity can be reduced and competence needs satisfied (Subramony, 2009). Clear and suitable performance evaluation criteria push TMT members to devote more time to joint decision making, reduce TMT disputes, and enhance organizational commitment and TMT integration (Lin & Shih, 2008).

An effective TMT should exhibit three characteristics: (1) a united team with consensus on the strategic goals and missions of their firm; (2) an effective team on strategic decision making to enhance organizational performance; and (3) a coherent entity that works consistently toward attaining the official company goals.

Fourth, having an incentive reward system, with a common set of inducements, can lead TMT members to perceive their context similarly and reinforce each other's attitudes and behavior toward organizational goals. Incentive pay could promote principal-agent compatibility and reduce agency problems (Lin & Shih, 2008). In other words, effective incentive plans for TMT members engender team spirit and organizational identification. Rewards for individual and team performance rather than only individual performance could improve TMT cooperation and cohesiveness (Subramony, 2009). Involved in a social exchange, TMT members tend to reciprocate by holding positive attitudes toward the firm and engaging in collaboration with each other. It can be argued that appropriate performance appraisals and compensation practices can have a synergistic role in improving TMT effectiveness.

Finally, developing a team climate also plays an important role in retaining and further improving TMT effectiveness (Martinez-del-Río et al., 2012). A collaborative team climate can enhance internal communication, information sharing, open dialogue, and mutual learning among TMT members (Martinez-del-Río et al., 2012). Therefore, TMT effectiveness can be achieved through improved mutual adaptability, team consensus, and a shared vision due to a developed team climate (Lin & Shih, 2008).

In sum, we propose that an executive SHRM system, as a set of teamwork-oriented SHRM practices for TMTs, can exhibit a positive relationship with TMT effectiveness. This leads to the following hypothesis:

Hypothesis 1: A teamwork-oriented Executive SHRM system is positively related to TMT effectiveness.

According to De Hoogh and Den Hartog (2008), an effective TMT should exhibit three characteristics: (1) a united team with consensus on the strategic goals and missions of their firm; (2) an effective team on strategic decision making to enhance organizational performance; and (3) a coherent entity that works consistently toward attaining the official company goals. Next, we elaborate on how TMT effectiveness can influence organizational ambidexterity in these three ways.

First, as noted earlier, an effective TMT is a united team with a consistent understanding of the goals and missions of the firm. An effective TMT with a shared set of firm goals and missions can work toward a common strategic direction that mitigates conflicting interests and disagreement among TMT members responsible for exploitative and explorative activities. O'Reilly and Tushman (2004) find that a clear vision shared within a firm's senior team permits exploitation and exploration to coexist and is crucial to achieving ambidexterity. With consensus on the firm's mission, TMT members tend to engage in interaction with each other; freely exchange information and knowledge; and identify, extract, and combine diverse skills, abilities, and perspectives (Fu et al., 2015). These processes enable the firm to gain timely information regarding how resources are utilized within the firm, and what other valuable resources may reside outside the firm, to mobilize resources in pursuit of combined ambidexterity (Cao et al., 2009, 2010).

Second, an effective TMT is manifested as a team on collective strategic decision making to enhance organizational performance. As a team, senior executives can combine diverse tacit knowledge/information and integrate perspectives to develop a viable, realistic strategy. In the face of environmental challenges such as varying customer demands and technological change, TMTs can help firms update and/or refine their strategy, invest in new businesses, revise existing technological and marketing trajectories, and build organizational consensus, actions critical to carrying out exploration and exploitation concurrently

(Floyd & Wooldridge, 1992). An effective TMT can also decide to align the sequential shift between exploration and exploitation with environment changes (i.e., market and technology), thus achieving ambidexterity (Jansen, Tempelaar, Van den Bosch, & Volberda, 2009).

Third, an effective TMT is a coherent entity that works consistently toward achieving proposed strategic goals. TMT effectiveness can lead to behavior integration through synchronizing social and task processes associated with collaborative behavior, and quantity and quality of information exchanging. Both of these engender social mechanisms, such as trust and knowledge reciprocity, increase opportunity for feedback and error correction, and assimilate new and existing knowledge/resources (Lubatkin et al., 2006). Thus, contradictory knowledge processes that underpin the attainment of exploration and exploitation can become complementary, allowing the pursuit of the combined ambidexterity (Halevi et al., 2015). A collaborative team will be more apt to translate conflicting and ambiguous expectations across exploratory and exploitative activities into workable strategies (Jansen et al., 2009). Thus, integrative and synergistic value across exploratory and exploitative activities can be created and ambidexterity achieved.

Drawing on the preceding discussion, we propose that organizational ambidexterity can be enhanced through TMT effectiveness. This leads to our second hypothesis:

Hypothesis 2: TMT effectiveness is positively related to organizational ambidexterity.

An executive SHRM system can affect organizational ambidexterity through the mediating role of other resources or capabilities. A high level of TMT effectiveness, as a capability, may be achieved when firms successfully establish an excellent executive SHRM system (Lin & Shih, 2008). Combining these arguments, it can be suggested that TMT effectiveness mediates the relationship between a firm's executive SHRM system and organizational ambidexterity. A teamwork-oriented executive SHRM system can help firms improve the effectiveness of top teams by providing selection and training opportunities efficiently, establishing appropriate performance appraisal systems and compensation packages, and building a collaborative team climate. Accordingly, we hypothesize:

Hypothesis 3: TMT effectiveness mediates the relationship between a teamwork-oriented executive SHRM system and organizational ambidexterity.

The Moderating Effect of Knowledge-Sharing Intensity

Existing studies from the information-processing perspective (e.g., Rogers, Miller, & Judge, 1999) view organizations as information-processing systems because strategic planning and implementation primarily have an informational role. Knowledge-sharing intensity, defined as the degree to which task information and know-how are provided to help others and to collaborate with others to solve problems, develop new ideas, or implement policies or procedures (Wang & Noe, 2010, p. 117), plays a critical role in the information-processing system. TMT researchers have built on the information-processing theory to conclude that the amount and type of knowledge shared by TMTs can influence strategy formulation and implementation.

An executive SHRM system can affect organizational ambidexterity through the mediating role of other resources or capabilities. A high level of TMT effectiveness, as a capability, may be achieved when firms successfully establish an excellent executive SHRM system.

A number of studies (e.g., Raes, Heijltjes, Glunk, & Roe, 2011; Wooldridge et al., 2008) have highlighted the key role of middle managers on strategy and have suggested that activities at the interface between TMTs and middle managers can improve the return from TMT effectiveness. Middle managers form the managerial layer below top managers and above the first-level supervisors in the organizational hierarchy. What makes middle managers unique is their access to top management coupled with their knowledge of operations (Wooldridge et al., 2008). This combination enables middle managers to function as intermediaries between the organization's strategy and day-to-day activities (Raes et al., 2011). Middle managers play an important role both as a critical "vertical link" within the hierarchy of an organization and as a horizontal integrator in the creation and distribution of organizational knowledge (Floyd & Wooldridge, 1992). These organizational actors can influence the strategic process by mediating vertically between the knowledge at the top and knowledge of operations at the bottom of the organization (Wooldridge et al., 2008). Despite this, information-processing theory has seldom been applied to investigate the interactions between TMTs and middle managers (see Raes et al., 2011, as one of the few exceptions). Building on the information-processing theory, Raes et al. (2011) argue that strategic decision

quality can be improved if middle managers share their knowledge with their supervisors and incorporate information into strategy process. As empirical studies to support this assumption are lacking, we empirically test if knowledge-sharing intensity from middle managers to TMTs moderates the relationship between TMT effectiveness and organizational ambidexterity. We outline the moderating role of knowledge-sharing intensity in terms of the following three processes: information exchange, conflict relief, and trust building (Raes et al., 2011).

First, high knowledge-sharing intensity is beneficial to exchanging information from middle managers to TMTs during decision making and implementation. Middle managers have markedly different knowledge from the TMT, because, compared with top executives, they are closer to new market development, day-to-day operations, and change in customers' demands, and are more aware of potential opportunities and problems the firms are facing. Looking at exploration, previous studies (e.g., Raes et al., 2011) argued that exploratory innovation stems from knowledge exchange, and coordination efforts and challenges necessary to leverage knowledge from not only TMTs but also actors across organizational levels including middle managers. With useful knowledge and insights provided by middle managers, an effective TMT tends to reduce information asymmetry with middle managers on new technologies and innovation skills, give market demand full consideration, and achieve an optimal strategy toward exploration. When looking at exploitation, as middle managers have intimate knowledge of the linkages between product development and outcomes, a high level of knowledge sharing from middle managers to TMTs allows an effective TMT to diagnose specific causes of a firm's problems in current ways of innovation and to make adjustments accordingly (Wooldridge et al., 2008). Furthermore, a knowledge conversation from middle to top managers can ensure the alignment of strategy with environmental circumstances. If the middle managers are open to discuss with TMT members opportunities and share explicit and tacit knowledge, such a TMT is more likely to formulate an optimal strategy to achieve organizational ambidexterity.

Manufacturing is the industry that has contributed the most to China's economic transformation in the past three decades. It contributed 45.3 percent of China's gross domestic product in 2012 and is by far the largest employer of urban employment, with 30.3 percent of the urban employment in 2012.

Second, high knowledge-sharing intensity can also be expected to have a key role in conflict relief. A number of scholars (e.g., Balogun & Johnson, 2005) have argued that intended strategies designed by an effective TMT may lead to unintended consequences because of strategic role conflict between TMTs and middle managers. When role conflict is relieved, TMTs and middle managers are more likely to understand each other's perspective, communicate more easily, and coordinate more effectively. Activities such as resource allocation and knowledge leveraging can then be carried out smoothly and effectively; thus, achieving organizational ambidexterity is more likely (Raes et al., 2011).

Third, high knowledge-sharing intensity from middle managers to TMTs is particularly relevant to trust because it underscores team members' common goals. Trust contains information such as taking each other's input seriously, observing each other's high level of competence, and highlighting each other's focus on organizational goals (Raes et al., 2011). By fostering trust and preventing disruptive conflict, a high degree of knowledge sharing instills a cooperative spirit, which contributes to achieving an alignment of the TMT's and middle managers' separate activities in the strategy process. An effective TMT targeting an ambidexterity strategy is then more likely to realize intended outcomes on exploration (e.g., acquired new innovation skills) and exploitation (e.g., upgrading skills in existing product development processes).

To conclude, a higher degree of knowledge sharing is particularly helpful as it channels efforts on information exchange, conflict relief, and trust building between TMTs and middle managers on activities related to strategy formulation and implementation. This leads to the following hypothesis:

Hypothesis 4: Knowledge-sharing intensity moderates the relationship between TMT effectiveness and organizational ambidexterity, such that the magnitude of this relationship is larger when knowledge-sharing intensity is larger.

Methods

Sampling and Procedure

Data were collected from Chinese-owned manufacturing firms in Northeast China during 2013. We selected the manufacturing industry and Northeast China for two reasons. First, manufacturing is the industry that has contributed the most to China's economic transformation in the

past three decades. It contributed 45.3 percent of China's gross domestic product in 2012 and is by far the largest employer of urban employment, with 30.3 percent of the urban employment in 2012 (National Bureau of Statistics of China, 2013). As such, China has been dubbed the Factory of the World by economic commentators. As HRM is perceived as critical in the transition to the modern manufacturing paradigm (Chen, Tang, Jin, Xie, & Li, 2014), empirical studies that analyze SHRM operating in manufacturing firms are needed. Second, few HRM and/or ambidexterity studies have been conducted on Chinese firms in this region even though it hosts the largest number of manufacturing firms in the world. In the past decade or so, as an old and once strategically important manufacturing base dominated by large state-owned firms, Northeast China has been experiencing major changes in its economic structure (e.g., Lee, 2007). As the old technology, production system, and products became outdated, firms in this region were encouraged by the Chinese government to promote innovation in high-technology fields such as new energy, new materials, and aerospace, and turn them into real applications. Thus, a top priority of these firms is to form efficient top teams to help the firms achieve excellent innovation performance in their existing and unexplored fields (Chen et al., 2014). Compared with other economic regions where fewer manufacturing firms operate, testing our hypotheses in this region can yield more significant results. In addition, it has been noted that HRM in China displays considerable regional diversity due to variations in institutional arrangements and patterns, and stage of economic development (e.g., Sheldon, Kim, Li, & Warner, 2011). Therefore, conducting our study in a concentrated area rather than in disperse parts of the country helps eliminate variations in the findings deriving from regional differences.

To address concerns related to single-rater biases and common method bias, we tested these hypotheses with data collected from multiple firms and from multiple respondents within each firm. We gathered data from chief executive officers (CEOs), TMT members, and middle managers. Consistent with previous research (e.g., Lin & Shih, 2008), TMT members in this study are identified as CEO and senior executives who report directly to CEO, such as chief information officers (CIOs), chief marketing officers (CMOs), and senior HR managers. As the scope of middle managers varies in firms of different sizes, we defined middle managers specifically as department or unit heads in functionally organized small to medium-sized firms (e.g., marketing and communication manager), and more broadly as general line managers (e.g., divisional or strategic business unit heads), functional line managers (e.g., vice presidents of marketing) and team- or project-based executives (e.g., leaders of strategic initiatives) in large-sized firms (Wooldridge et al., 2008).

Collecting data directly from firms is difficult in China due to the weak cooperation culture between the academia and industry (e.g., Davies & Walters, 2004). Following Davies and Walters's (2004) advice, we solicited assistance from local government agencies that were able to request data from firms in their area of authority. This procedure was expected to facilitate data collection since Chinese firms often depend on these government agencies for support. Using the list of manufacturing firms under the jurisdiction of those agencies, we applied a probability sampling approach to obtain a representative sample (Davies & Walters, 2004). The manufacturing firms targeted in this region are predominantly small to medium-sized and state owned, and most are in the energy, machinery, and pharmaceutical industries. With the help of the local government agencies, we identified and invited 267 firms to participate; based on their age, size, ownership structure, and industry affiliation, they seemed representative of the target population. All 267 firms agreed to participate in the study.

We defined middle managers specifically as department or unit heads in functionally organized small to medium-sized firms (e.g., marketing and communication manager), and more broadly as general line managers (e.g., divisional or strategic business unit heads), functional line managers (e.g., vice presidents of marketing) and team- or project-based executives (e.g., leaders of strategic initiatives) in large-sized firms.

We screened the employee list provided by the personnel department of each firm and selected six employees as potential respondents. The six were a CEO, two TMT members, and three middle managers. With this sample frame, we could collect information on different variables from respondents working in different positions. These respondents were chosen as they are the most knowledgeable informants at their level. Once consent from the top management of each participating firm had been secured, we asked the HR managers to arrange site visits. To generate valid information in the Chinese context, we recruited trained researchers to conduct onsite data collection. We informed participants of the objectives of the

TABLE I Sample Characteristics (N = 144)

	Frequency	Percent (%)
Firm size (no. of employees)		
< 100	40	27.8
100–1000	84	58.3
> 1000	20	13.9
Ownership structure		
State owned	97	67.4
Non–state owned	47	32.6
Industry type		
Basic metal	37	25.7
Nonmetallic mineral	35	24.3
Fabricated metal	7	4.9
Machinery equipment	17	11.8
Thermal power	13	9.0
Chemicals	6	4.2
Energy	14	9.7
Mining	9	6.3
Building materials	6	4.2
Firm age (in years)		
≤ 5	24	16.7
6–10	54	37.5
> 10	66	45.8

survey, described the voluntary nature of participation, assured anonymity of their responses, and provided a gift as incentive for participating. Participants completed the questionnaires at work, and the researchers combined the questionnaires answered by respondents from the same firm, thus creating a matched survey sample.

Due to the confidentiality policy of some companies and some incomplete instruments, questionnaires with missing values were excluded. The final sample consisted of 144 matching questionnaires, and the final response rate was 53.9 percent (144/267). This exceeds the response rate from comparative firm-level studies reviewed by Becker and Huselid (1998), where they ranged from 6 percent to 28 percent. Table I presents a summary of our sample. According to Table I, 86.1 percent of respondent firms are small to-medium-sized, and 67.4 percent of these firms are state owned, which is representative of the total population. We followed Luca and Atuahene-Gima (2007) in comparing a sample of 50 matched questionnaires with a sample of unmatched questionnaires for which we had data on firm age and number of employees. Analyses of variance indicated no significant differences between the two groups on firm age (F = 0.50) or number of employees (F = 0.42), indicating no possibility of nonresponse bias.

Measurement Items

To help ensure the validity of the survey, we sought items in measures that had been applied in previous studies (see Appendix A). All multi-item measures were based on a 5-point Likert scale. As the measures were derived mainly from Western literature in English, a back-translation technique (Brislin, 1980) was deployed to develop the survey in Chinese with the assistance of two independent researchers.

Executive SHRM System (Aggregated, Average Ratings of TMT Members)

A 22-item scale developed by Lin and Shih (2008) was used to measure this variable. TMT members (except the CEOs) were asked to indicate the degree to which the statements accurately described their firms' SHRM system toward senior executives (from 1 = strongly disagree to 5 = strongly agree). We did not ask CEOs to answer measurement items of the executive SHRM system for two reasons. First, the composition of the respondents for the executive SHRM system differs from that of TMT effectiveness. Maintaining this difference could help to avoid common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Second, it is always difficult to collect first-hand data from Chinese firms, and the construct of executive SHRM systems had 22 measurement items, a relatively large number for respondents. Further, CEOs might not be willing to respond to long academic questionnaires and delegate the task, thus running the risk of not getting the CEOs' views. To improve the accuracy of respondents' answers on other constructs and to increase the respondent rates, we decided not to ask CEOs to rate items of executive SHRM systems.

The variable had the following five dimensions: sample items are selection (such as "My company tends to select top management team members from current staff"), compensation ("The pay raises for top management team members in my company are based on both merit and company tenure"), training ("My company provides communication and problem-solving training programs for top management team members"), performance appraisal ("Performance appraisal for top management team members in my company is fair and just"), and developing teamwork climate ("My company emphasizes a culture of cooperation and collaboration"). We aggregated the scores for the five dimensions to form an overall composite measure of the executive SHRM system for three reasons.

First, an executive SHRM system is a higher-level construct underlying its dimensions (a latent construct). Law, Wong, and Mobley (1998) suggested three alternative approaches to specifying and modeling a multidimensional construct: latent model, aggregate model, and profile model.

The latent model is consistent with our theoretical conceptualization of an executive SHRM system and the direction of the relationship between the executive SHRM system and its five dimensions. For example, a firm with a superior executive SHRM system should strongly exhibit every dimension, whereas the opposite is not necessarily the case. The alternative specifications of the measurement model are not appropriate because, in either the aggregate model or profile model, the multidimensional construct exists at the same level as the dimensions, and the dimensions form the construct. According to Wong, Law, and Huang (2008), when a multidimensional construct is defined under the latent model, empirical analyses should be conducted at the construct level if the conclusions drawn are about the overall multidimensional construct instead of its dimensions. Therefore, for a latent construct, only common variances or covariances shared by all dimensions as true variances of the construct are considered (Wong et al., 2008). Under Lin and Shih's (2008) conceptualization, different dimensions of an executive SHRM system are merely different manifestations of a firm's HRM system toward top executives.

In addition, the five dimensions of the executive SHRM system scale have been confirmed to be highly correlated with each other (Lin & Shih, 2008). We also confirmed that our data follows the conceptual pattern described by Lin and Shih (2008) by running a second-order analysis to access the homogeneity of the five dimensions using the AMOS 7 software package. All the measurements were modeled to load to the corresponding dimensions, all five of which loaded onto an overall higher-order factor measuring the executive SHRM system. Convergent validity was examined by investigating the item loadings and their significance. Following Hair, Black, Babin, Anderson, and Tatham (2010), we used the overall model's chi-square, the Tucker-Lewis Index (TLI), the comparative fit index (CFI), and the root mean square error of approximation (RMSEA) to assess model fit. The second-order model fitted the data very well (χ^2 [199] = 345.78, TLI = 0.90, CFI = 0.92, RMSEA = 0.072). We also ran correlation analyses, and these five dimensions were highly correlated, ranging from 0.62 to 0.78. In addition, each dimension was significantly associated with TMT effectiveness, ranging from 0.48 to 0.60. Finally, studies have regarded various HRM systems such as flexibility-oriented HRM (Chang, Gong, Way, & Jia, 2013) as a single composite factor in China. Thus, our approach is consistent with past research of HRM. The Cronbach's reliability coefficient was then calculated. The alpha value was 0.95, indicating acceptable measurement reliability.

TMT Effectiveness (Aggregated, Average Ratings of TMT Members)

A four-item scale from De Hoogh and Den Hartog (2008) was used to measure TMT effectiveness. TMT members (including CEOs) were asked to indicate the degree to which the statements accurately described the working effectiveness of their senior executives (ranging from 1 = strongly disagree to 5 = strongly agree). A sample item is: "The top management is a coherent entity that works consistently toward the official company goals." Cronbach's alpha for this measure was 0.90, indicating acceptable measurement reliability.

Knowledge-Sharing Intensity (Aggregated, Average Ratings of Middle Managers)

A four-item scale developed by Faraj and Sproull (2000) was used to measure the degree of knowledge sharing between TMT members and middle managers. Middle managers responded using a 5-point response scale ranging from 1 = strongly disagree to 5 = strongly agree. A sample item is: "When I am asked about other areas of expertise by TMT members, I will not hesitate to tell them all I know." Cronbach's alpha for this measure was 0.68. This relatively low value reflects the broad domain of knowledge sharing from middle managers to TMT members. As this is in line with other studies with similar situations (e.g., Chuang & Liao, 2010; Farh, Hackett, & Liang, 2007), we concluded that the Cronbach's alpha value indicates acceptable reliability.

We aggregated the scores for the five dimensions to form an overall composite measure of the executive SHRM system for three reasons.

Organizational Ambidexterity (Aggregated, Average Rating of TMT Members)

Ambidexterity was assessed by using measures of both exploration and exploitation. The measures are based on an established six-item scale published by Athuahene-Gima (2005). TMT members (including CEOs) were asked to indicate the degree to which the statements regarding product development accurately described their firms' orientations over the last three years (from 1 = strongly disagree to 5 = strongly agree). A three-item scale was used to measure exploitation (such as "We have upgraded skills in product development processes where the firm already possesses significant experience"), and a three-item scale was used to measure exploration (such

as "We have acquired manufacturing technologies and skills that are entirely new to the firm"). A number of scholars have argued the inseparable nature of exploration and exploitation and combined both measures to create an index of ambidexterity (e.g., Floyd & Lane, 2000). For example, Gibson and Birkinshaw (2004) multiplied exploitation and exploration to create the index, while Lubatkin et al. (2006) summed the measures. Lubatkin et al. (2006) compared the different combinations and concluded that the "summed" method contained the least information loss in aggregating exploration and exploitation into a single latent factor of ambidexterity. Therefore, in this study, we follow Lubatkin et al.'s (2006) method to measure organizational ambidexterity as the sum of exploitation and exploration.

Variables of interest in this study were conceptualized at the firm level, which required an aggregation of the executive SHRM system, TMT effectiveness, and organizational ambidexterity in terms of exploration and exploitation rated by the TMT members and knowledge-sharing intensity rated by the middle managers.

Control Variables

We introduced several firm characteristics as control variables, which may be associated with both TMT effectiveness and organizational ambidexterity. These included firm age, size, industry type, ownership structure, average TMT tenure, TMT number, and financial performance. Specifically, we controlled firm age by controlling for the years since the firm opened its business. We controlled for firm size by taking the natural logarithm of the number of employees of a firm. We controlled for industry subtype since those may capture different environmental dimensions, which can impact firms' ambidexterity. We coded ownership structure as 1 for state owned and 0 for non–state owned. We controlled for average TMT tenure by measuring the average tenure as reported by all TMT members, and controlled for TMT members by taking the total number of TMT members of a firm. Finally, we controlled financial performance by adopting four measurement items from Judge and Douglas (1998). CEOs serve as the respondents for this measure. A 5-point Likert-type scale was used, ranging from 1 = far below the average to 5 = far above the average. A sample item included: "Our profitability has been substantially better than all other competitors." Cronbach's alpha for this measure was 0.90, which is accepted.

Data Analysis and Results

Aggregation Tests

Variables of interest in this study were conceptualized at the firm level, which required an aggregation of the executive SHRM system, TMT effectiveness, and organizational ambidexterity in terms of exploration and exploitation rated by the TMT members and knowledge-sharing intensity rated by the middle managers. We examined within-group agreement of multiple-item R_{wg}(j) (Bliese, 2000) and intermember reliability interclass correlation (ICC-1 and -2 (James, 1982). The mean R_{wg} values were 0.91 for the executive SHRM system, 0.88 for TMT effectiveness, 0.90 for knowledge-sharing intensity, 0.88 for exploitation, and 0.86 for exploration. No strict decision rules exist for the R_{wg} statistic (Lance, Butts, & Michels, 2006), but a common rule of thumb suggests that R_{wg} values should be equal to or greater than 0.70 (e.g., Chen, Mathieu, & Bliese, 2002). All the R_{wg} values in our study are greater than 0.70. ICC-1 indicates the proportion of variance in ratings due to firm employees, whereas ICC-2 indicates the reliability of firm mean differences (Bliese, 2000). The ICC-1 scores are as follows: executive SHRM system, 0.19, F-value = 1.47, $p < 0.05$; TMT effectiveness, 0.23, F-value = 1.88, $p < 0.01$; exploitation, 0.16, F-value = 1.56, $p < 0.01$; exploration, 0.11, F-value = 1.39, $p < 0.05$; and knowledge-sharing intensity, 0.35, F-value = 2.31, $p < 0.01$. These values indicated convergence within teams since the between-group mean square is significantly higher than the within-group mean square (Biemann, Cole, & Voelpel, 2012). The ICC-2 values for these variables were 0.32, 0.47, 0.36, 0.28, and 0.57, respectively, which are lower than those generally found in team research. This is because ICC-2 is a function of team size (number) (e.g., Bliese, Halverson, & Schriesheim, 2002), and the average TMT size (number) in this study (M = 3.51) is not large enough to generate ICC-2 values as high as those in other studies. Following studies with similar situations (e.g., Zhang, Cao, & Tjosvold, 2011), we concluded that the within-team ratings were homogeneous enough to be aggregated.

Testing the Measurement Model

We conducted confirmatory factor analyses (CFAs) to evaluate the distinctiveness of the key variables. Given that the sample size is relatively small compared to the number of measurement items, we simplified the measurement model by reducing the number of items for the key variables to prevent the fit problem caused by including too many indicators (Hui, Lee, & Rousseau, 2004). Following

parceling procedures frequently used by researchers (e.g., Hui et al., 2004), we reduced the number of items by creating three indicators for each single-dimension construct. We combined the two items with the highest and lowest factor loadings into one aggregate score, then the second-highest and second-lowest factor loading, until all items had been assigned to one of the indicators. The scores for each indicator were then computed as the mean of the scores on the constituent items. As the second-order analysis of the executive SHRM system yielded an acceptable fit index, scores for each dimensions of the executive SHRM system were computed as the mean of the scores on the items that constituted each dimension (Hui et al., 2004). As we treated organizational ambidexterity as a combination of exploration and exploitation, we only tested a three-factor CFA model that included only the executive SHRM system, TMT effectiveness, and knowledge-sharing intensity. As shown in Table II, this model provided a good fit to the data: χ^2 (41) = 56.17, $p \leq 0.01$; CFI = 0.98, TLI = 0.98, RMSEA = 0.051. In addition, all of the loadings of indicators were significant at $p < 0.01$, with the standardized loadings ranging from 0.51 to 0.89, indicating convergent validity (Hair et al., 2010).

We tested the discriminant validity of the three key variables by contrasting the three-factor CFA model against alternatives. The three-factor model fit the data considerably better than any of the alternatives (see Table II). Thus, the distinctiveness of the three variables in the study was supported. Given these results, all three variables were applied in the subsequent analyses. Table III reports the descriptive statistics and correlation matrix.

Testing the Hypotheses

Recent studies tended to use stepwise regression instead of structural equation modeling (SEM) to test models involving interactive effects, such as the ones developed here (e.g., Chatterjee & Ravichandran, 2013). It is argued that compared with SEM, which requires a relatively large sample size, using linear regression to test moderating relationships is preferred as it can produce accurate estimates of the strength of the linkages between interaction products without loss of power (Goodhue, Lewis, & Thompson, 2007). Table IV shows the results of these regressions. Models 1 and 2 specify the effects of the control variables and executive SHRM system on TMT effectiveness, respectively. Three additional models were then developed to test the mediating hypotheses. Model 3 shows a regression equation on organizational ambidexterity with control variables. In Model 4, we added the executive SHRM system based on the control variables. In Model 5, we added TMT effectiveness. Four further models were developed to test the moderating hypotheses. Model 6 shows a regression equation on organizational ambidexterity with control variables. In Model 7, we added the executive SHRM system. We added knowledge-sharing intensity in Model 8, and the multiplied moderating variables in Model 9.

As the results in Table IV show, the data in Model 1 indicate that none of the control variables are significant. The explanatory power of the equation is not significant ($R^2 = 0.13$, $F = 1.34$, $p > 0.05$). In Model 2, the executive SHRM system has a significant and positive effect on TMT effectiveness ($\beta = 0.62$, $p < 0.01$). The explanatory power of this equation is significant at the 0.01 level (with $\Delta F = 85.83$), thereby supporting Hypothesis 1.

Similarly, the data in Model 6 indicate that the effect of financial performance is positive and significant ($\beta = 0.23$, $p < 0.05$). The explanatory power of the equation is not significant ($R^2 = 0.08$, $F = 0.83$, $p > 0.05$). In Model 7, TMT effectiveness has a significant and positive effect on

TABLE II Results of Confirmatory Factor Analysis for Three Variables Studied

Model	χ^2	Df	$\Delta\chi^2$	TLI	CFI	RMSEA
Three-factor model	56.17	41		0.98	0.98	0.051
Two-factor model-1: Executive SHRM system and TMT effectiveness combined	176.31	43	120.14**	0.81	0.85	0.147
Two-factor model-2: Executive SHRM system and knowledge–sharing intensity combined	124.05	43	67.88**	0.89	0.91	0.115
Two-factor model-3: TMT effectiveness and knowledge–sharing intensity combined	130.72	43	74.55**	0.88	0.90	0.119
One-factor model	243.84	44	187.67**	0.73	0.78	0.178

Note: TLI = Tucker-Lewis index; CFI = comparative fit index; RMSEA = root-mean-square error of approximation.

TABLE III Means, Standard Deviations, and Correlations

Variables	1	2	3	4	5	6	7	8	9	10
1. Firm age	-									
2. Firm size (log)	–0.04	—								
3. Ownership structure	0.30**	0.04	—							
4. Average TMT tenure	0.68**	0.00	0.31**	—						
5. TMT number	–0.00	0.66	0.05	0.07	—					
6. Financial performance	0.14	0.08	0.10	0.19*	0.02	—				
7. Executive SHRM system	0.04	0.12	–0.12	0.02	0.03	0.08	***(0.95)***			
8. TMT effectiveness	0.14	0.01	–0.04	0.10	–0.06	0.20*	0.64**	***(0.90)***		
9. Knowledge–sharing intensity	–0.02	–0.07	0.08	0.03	–0.04	0.21*	0.27**	0.23**	***(0.68)***	
10. Organizational ambidexterity	0.06	0.07	0.04	0.02	0.00	0.23*	0.60**	0.61**	0.35**	—
Mean	13.78	5.35	0.67	8.38	3.51	3.81	3.90	4.09	3.96	7.82
SD	10.08	1.17	0.47	4.94	2.90	0.75	0.41	0.42	0.38	0.84

Notes: $N = 144$.
** $p \leq 0.01$; * $p \leq 0.05$.
Cronbach's alpha appears along the diagonal in the brackets.

organizational ambidexterity ($\beta = 0.63$, $p < 0.01$). The explanatory power of this equation is significant at the 0.01 level (with $\Delta F = 76.15$). Thus, Hypothesis 2 is supported.

Using procedures recommended by Baron and Kenny (1986), we tested Hypothesis 3. According to Baron and Kenny (1986), the mediation test should meet three conditions in the regression analyses: (1) the independent variable (i.e., executive SHRM system) is significantly related to the mediator (TMT effectiveness); (2) the independent variable is significantly related to the dependent variable (organizational ambidexterity); and (3) when the mediator is present, if the relationship between the independent and the dependent variable becomes nonsignificant, full mediation is supported. If the relationship is still significant but weaker, then partial mediation is supported. The results presented in Table IV show that Condition 1 is supported, as the executive SHRM system was positively related to TMT effectiveness. Condition 2 is also supported since the executive SHRM system was positively related to organizational ambidexterity ($\beta = 0.60$, $p < 0.01$, Model 4). Condition 3 is supported based on the evidence that the relationship between the executive SHRM system and organizational ambidexterity is still significant but weaker when TMT effectiveness was entered into the model ($\beta = 0.36$, $p < 0.01$, Model 5). To conclude, these results support Hypothesis 3 and show that TMT effectiveness partially mediates the relationship between the executive SHRM system and organizational ambidexterity.

To examine the moderation hypothesis (Hypothesis 4), we carried out regression analyses. All interaction variables were mean centered to minimize multicollinearity. Hypothesis 4 predicts that knowledge–sharing intensity moderates the relationship between TMT effectiveness and organizational ambidexterity. As shown in Table IV, the interaction between TMT effectiveness and knowledge sharing intensity was positively related to organizational ambidexterity ($\beta = 0.19$, $p < 0.01$, Model 9). To determine the nature of the moderating effect, we plotted the interaction by computing slopes one standard deviation above and below the mean of TMT effectiveness. Figure 2 shows this interaction pattern. Consistent with Hypothesis 4, TMT effectiveness had a stronger positive relationship with organizational ambidexterity when the degree of knowledge sharing was high ($\beta = 0.73$, $p < 0.01$) rather than low ($\beta = 0.35$, $p < 0.01$).

Robustness Check

Following the recommendations of Zhao, Lynch, and Chen (2010), we further used Sobel tests

TABLE IV Results of Hierarchical Regression Analyses

	TMT Effectiveness		Organizational Ambidexterity						
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Control variables									
Firm age	0.07	0.07	0.08	0.08	0.05	0.08	0.03	0.06	0.03
Firm size (log)	0.07	–0.04	0.09	–0.02	–0.00	0.09	0.04	0.06	0.06
Ownership structure	–0.09	0.02	0.03	0.13	0.13	0.03	0.09	0.06	0.07
Average TMT age	0.02	0.01	–0.07	–0.08	–0.09	–0.07	–0.08	–0.09	–0.07
TMT number	–0.05	–0.02	–0.05	–0.02	–0.01	–0.05	–0.02	–0.02	–0.02
Financial performance	0.14	0.11	0.23*	0.19*	0.15*	0.23*	0.14*	0.10	0.12
Basic metal	0.08	0.09	–0.03	–0.02	–0.05	–0.03	–0.08	–0.04	–0.02
Nonmetallic mineral	–0.13	–0.01	–0.02	0.10	0.10	–0.02	0.07	0.08	0.09
Fabricated metal	–0.09	–0.07	0.02	0.04	0.06	0.02	0.07	0.04	0.07
Machinery equipment	–0.14	–0.11	0.01	0.05	0.09	0.01	0.10	0.12	0.14
Thermal power	0.07	0.06	0.06	0.05	0.03	0.06	0.02	0.02	0.03
Chemicals	–0.02	0.08	–0.06	0.03	–0.00	–0.06	–0.05	–0.02	–0.01
Energy	0.05	0.02	0.06	0.03	0.02	0.06	0.03	0.05	0.06
Mining	0.05	0.04	0.07	0.06	0.04	0.07	0.04	0.05	0.07
Independent variable									
Executive SHRM system		0.62**		0.60**	0.36**				
Mediator									
TMT effectiveness (TMTE)					0.40**		0.63**	0.58**	0.54**
Moderator									
Knowledge–sharing intensity (KSI)								0.21**	0.21**
Interaction									
TMTE × KSI									0.19**
R^2	0.13	0.48	0.08	0.41	0.49	0.08	0.43	0.46	0.49
$\triangle R^2$	0.13	0.35	0.08	0.33	0.08	0.08	0.34	0.04	0.03
F	1.34	7.80**	0.83	5.95**	7.73**	0.83	6.31**	6.77**	7.21**
$\triangle F$	1.34	85.83**	0.83	71.29**	20.64**	0.83	76.15**	8.29**	8.15**

Notes: $N = 144$.
**$p \leq 0.01$; *$p \leq 0.05$.

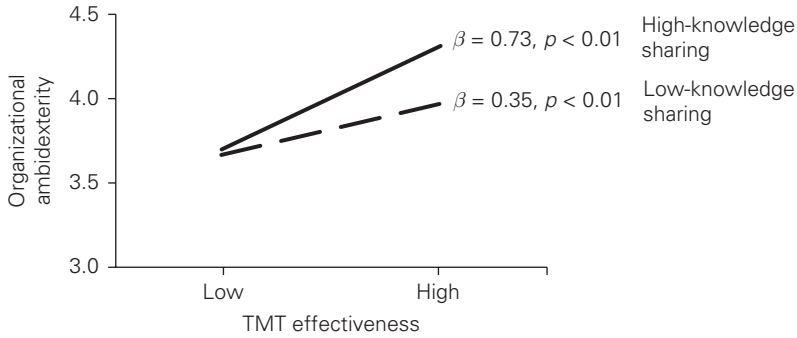

FIGURE 2. The Moderating Effect of Knowledge-Sharing Intensity on the Relationship between TMT Effectiveness and Organizational Ambidexterity

(Sobel, 1982) and the bootstrapping mediation test (Preacher & Hayes, 2008) to test the mediating effect (i.e., Hypothesis 3). The Sobel test results indicate a significant indirect effect of the executive SHRM system on organizational ambidexterity through TMT effectiveness (Z = 4.25, p < 0.01). In recent studies, some authors (e.g., Preacher & Hayes, 2008; Zhao et al., 2010) question the use of Baron and Kenny's (1986) mediation testing while emphasizing the superiority of bootstrap procedures for statistical tests (for a useful review see Zhao et al., 2010). To test our mediation relationship more thoroughly, we drew on the work of Preacher and Hayes (2008) to apply bootstrapping. Preacher and Hayes's (2008) SPSS macro with 5,000 bootstrapped samples identifies the presence of indirect mediation only (Zhao et al., 2010). Controlling for TMT effectiveness, the direct effect of the executive SHRM system on organizational ambidexterity is still significant (β = 0.36; t-value = 4.29, p < 0.01). The indirect path (β = 0.25) had a 99 percent confidence interval that did not include 0 (0.04, 0.42). To conclude, these results support Hypothesis 3.

The Sobel test results indicate a significant indirect effect of the executive SHRM system on organizational ambidexterity through TMT effectiveness (Z = 4.25, p < 0.01).

Past studies (e.g., Gibson & Birkinshaw, 2004) on organizational ambidexterity multiplied exploitation and exploration to create a measure of organizational ambidexterity. Although Lubatkin et al. (2006) have argued for the preference of the "summed" method, we tested our model by multiplying exploitation and exploration. The results show that when TMT effectiveness is present, the relationship between the executive SHRM system and organizational ambidexterity is still significant but weaker (from β = 0.58, p < 0.01 to β = 0.34, p < 0.01), thus partial mediation is supported. The results also show that the interaction between TMT effectiveness and knowledge–sharing intensity was positively related to organizational ambidexterity (β = 0.18, p < 0.01), indicating that knowledge–sharing intensity positively moderates relationship between TMT effectiveness and organizational ambidexterity.[1]

To confirm Hypothesis 4 and test the moderated mediation effect of knowledge–sharing intensity, we also used an SPSS macro designed by Preacher, Rucker, and Hayes (2007). This macro facilitates the implementation of the recommended bootstrapping methods and provides a method for probing the significance of conditional indirect effects at different values of the moderator variable. Results (see Table V) indicate that the cross-product term between TMT effectiveness and knowledge–sharing intensity is significant (β = 0.85, t-value = 2.84, p < 0.01). Hypothesis 3 is supported. To examine the moderated mediation role of knowledge–sharing intensity, we examined the conditional indirect effect of executive SHRM system on organizational ambidexterity (through TMT effectiveness) at three values of knowledge–sharing intensity (see middle of Table V): the mean (3.96), one standard deviation below the mean (3.58), and one standard deviation above the mean (4.34). Normal-theory tests indicate that two of the three conditional indirect effects (based on moderator values at the mean and at +1 standard deviation) are positive and significantly different from zero. Bootstrap confidence intervals corroborated these results. Preacher et al.'s (2007) macro also computes conditional indirect effects at various arbitrary values of the moderator that fall within the range of the data (see the lower half of Table V). This output complements the more typical probing of the interaction using one standard deviation above and below the mean. It also allows us to identify the values of knowledge–sharing intensity for which the conditional indirect effect is just statistically significant at alpha = 0.05.

TABLE V Regression Results for Conditional Indirect Effect

Predictor	B	SE	t-value	p-value
TMT effectiveness				
Constant	1.57	0.26	6.10	0.00
Executive SHRM system	0.64	0.07	9.80	0.00
Organizational ambidexterity				
Constant	14.68	4.96	2.96	0.00
Executive SHRM system	0.62	0.16	3.88	0.00
TMT effectiveness	–2.69	1.22	–2.21	0.03
Knowledge–sharing intensity	–3.06	1.23	–2.49	0.02
TMT effectiveness ´Knowledge–sharing intensity	0.85	0.30	2.84	0.01
Knowledge sharing	**Boot Indirect Effect**	**Boot SE**	**Boot z**	**Boot p**
Conditional indirect effect at knowledge-sharing intensity = Mean ± 1 SD				
-1 SD (3.58)	0.22	0.16	1.37	0.17
Mean (3.96)	0.42	0.13	3.26	0.00
+1 SD (4.34)	0.63	0.14	4.43	0.00
Conditional indirect effect at range of values of knowledge-sharing intensity[a]				
3.125	–0.02	0.20	–0.09	0.93
3.219	0.03	0.19	0.19	0.85
3.313	0.09	0.17	0.50	0.62
3.406	0.14	0.16	0.87	0.38
3.500	0.19	0.15	1.30	0.19
3.594	0.24	0.13	1.80	0.07
3.622	0.26	0.13	1.96	0.05
3.688	0.29	0.12	2.35	0.02
3.781	0.34	0.12	2.94	0.00
3.875	0.40	0.11	3.51	0.00
3.969	0.45	0.11	4.01	0.00
4.063	0.50	0.11	4.40	0.00
4.146	0.55	0.12	4.65	0.00
4.250	0.60	0.13	4.78	0.00
4.344	0.65	0.14	4.81	0.00
4.438	0.70	0.15	4.78	0.00
4.531	0.76	0.16	4.71	0.00
4.625	0.81	0.17	4.62	0.00
4.719	0.86	0.19	4.53	0.00
4.813	0.91	0.21	4.44	0.00
4.906	0.96	0.22	4.34	0.00
5.000	1.01	0.23	4.26	0.00

Notes: N = 144. Unstandardized regression coefficients are reported. Bootstrap sample size = 5000.
[a]Range of values represent an abbreviated version of the output provided by the macro.

Results demonstrate that the conditional indirect effect is significant at alpha = 0.05 for any value of knowledge–sharing intensity equal to, or greater than, 3.622.

As additional robustness checks, we retested the model using SEM run with one interaction term as multiplicative terms, as suggested by Marsh, Wen, and Hau (2004). The results are

similar to the ones using linear regression analysis. The relationship between the executive SHRM system and organizational ambidexterity is still significant (path coefficient is 0.38, $p < 0.01$) when TMT effectiveness was added. The moderating effect of knowledge–sharing intensity on TMT effectiveness—organizational ambidexterity linkage is also significant (path coefficient is 0.22, $p \leq .01$). The fit index remains within the acceptable range (χ^2 [114] = 163.14, TLI = 0.96, CFI = 0.97, RMSEA = 0.055).

Conclusions

Drawing on RBV and information-processing theory, this study conceptualized and tested a firm-level model that provides insight into the linkages between the executive SHRM system and organizational ambidexterity. Our results show that TMT effectiveness partially mediates the executive SHRM system–organizational ambidexterity relationship. Our results also suggest that the degree of knowledge sharing from middle managers to TMT members moderates the relationship between TMT effectiveness and organizational ambidexterity.

It fills an important gap in the research of SHRM by focusing on the HRM system at the TMT level.

Theoretical and Methodological Contributions

This study makes a number of related theoretical and methodological contributions in extending our knowledge on SHRM and organizational ambidexterity in general. First, it fills an important gap in the research of SHRM by focusing on the HRM system at the TMT level. In the past two decades or so, there has been a bourgeoning body of research on SHRM and firm performance. However, the majority of the research focuses on the ordinary employee level rather than the senior executive level, with a few exceptions (e.g., Collins & Clark, 2003; Martell & Carroll, 1995). As TMT members play an important role in organizational behavior and outcomes (Hambrick & Mason, 1984), how to effectively select, train, evaluate, and reward top managers toward a teamwork orientation has strategic implications. Accordingly, it is necessary to study SHRM practices at the executive level (Lin & Shih, 2008). This study highlights how a teamwork-oriented executive SHRM system, as the set of HR practices at the TMTs, supports TMT capability and enhances organizational ambidexterity, regardless of the content/type of firm strategy (Lin & Shih, 2008). This focus is critical since an executive SHRM system impacts strategy initiator and navigates the competitive landscape of firms.

Second, while studies exist on the antecedents of organizational ambidexterity, past research has focused on TMT characteristics or processes (e.g., Simsek, 2009; Smith & Tushman, 2005). Until now, no study has examined how SHRM systems at the TMT level influence ambidexterity, despite the importance of an executive SHRM system in achieving strategic goals (e.g., Lubatkin et al., 2006). Retaining and motivating talented employees, particularly those of TMTs, are of critical importance in building organizational competitive advantage, so firms need to implement teamwork-oriented executive SHRM systems and for a TMT to have a high level of effectiveness. Our study makes a serious attempt to address this research gap through a systematic and comprehensive examination of the SHRM system for top executives' collaboration, and also the process through which the HRM system can yield desirable results, as well as its effects on organizational ambidexterity. This article demonstrates that an executive SHRM system has great influence on organizational ambidexterity and that TMT effectiveness mediates the relationship. From a conceptual standpoint, studying TMT effectiveness allows scholars to reveal specific processes and conditions that may translate executive SHRM systems into better organizational ambidexterity. In so doing, this study contributes to the antecedents of organizational ambidexterity and also to the work on TMT effectiveness, by showing TMTs' importance on strategic outcomes.

Third, by focusing on the moderating role of middle managers' knowledge-sharing intensity, we respond to the call for studies on the interface between TMTs and middle managers (Raes et al., 2011). While TMTs whose activities are characterized as being strategic have been relatively well studied, their interactions with the middle managers have been much less examined, despite their strategic and operational importance. Thus, this study provides connections of one important group of employees to another and organizational ambidexterity. It also provides a better understanding of the mechanism underlying middle managers' behavior and its boundary conditions and thereby helps enrich SHRM research. Specifically, we advance this line of thinking by specifying and expanding on the role of middle managers to examine the significant role of knowledge sharing from middle managers to TMTs. We show that knowledge-sharing intensity from middle managers to TMTs is important for driving organizational ambidexterity and thus expand the current theory of strategic HRM. Although the strategic role of middle managers has recently attracted considerable research interest (Raes, Bruch, & De

Jong, 2013), it has rarely been applied to the context of strategic HRM. This study therefore fills an important gap.

Practical Implications

This research has a number of implications for firms seeking ways to increase the benefits of their executive SHRM system. First, the findings support the initial proposition that various SHRM practices for top executives, as a system, can balance the contradiction between exploitation and exploration through improved TMT effectiveness. These findings suggest that in order to achieve organizational ambidexterity, firms can benefit from the adoption of multiple teamwork-oriented executive SHRM practices. This is particularly relevant to Chinese firms, many of which still have limited HR capability. HR deficiency is even more evident in managing top executives and talent, as many Chinese firms, driven by a quick-fix mentality, often resort to recruiting externally instead of building internal capability through developing an effective HRM system (Cooke, Saini, & Wang, 2014).

Second, the identification of top team effectiveness as the mechanism through which an executive SHRM system promotes ambidexterity indicates the importance of carrying out SHRM system in term of HR practices at the executive level. Thus, firms can select effective practices to motivate or guide top managers to enhance their effectiveness. For example, firms can select TMT members by using appropriate recruitment skills or tools. They can select candidates who are open-minded, teamwork oriented, and so on. Training programs for executives can also highlight problem-solving or communication abilities and participation intentions. These HR interventions may enable and motivate the executives to become more involved in firms' strategic decision-making process. Moreover, firms can develop a learning and supportive climate among top managers to encourage them to work coherently toward a united strategic vision.

Third, the cross-level relationship we detected between TMT and middle managers' behavior suggests that an optimal level of organizational ambidexterity can be achieved when middle managers are open to their supervisors and share information or knowledge with them. We argue, based on the evidence of our findings, that obtaining an effective TMT alone is not sufficient for a firm to turn its strategic vision into reality. Instead, interactions between TMTs and middle managers are critical to turning strategy into desired performance. Thus, TMTs should realize that middle managers matter in the process of strategy formulation and implementation and should encourage and motivate them to share knowledge. This realization requires certain types of leadership skills and behavior from TMT members, which can be developed through training and development.

Limitations and Future Research

This study has several potential limitations that should be addressed in future research. First, data was collected from Chinese-owned manufacturing firms in Northeast China. Future research should extend our study to firms of other ownership forms and in other parts of the country to test the generalizability of, and to refine, our model. Our study can also be extended to other societal contexts for the same purpose.

Second, given the use of cross-sectional data, no causal inference can be made regarding the relationship tested in this study, even though the relationships depicted in Figure 1 were based on previous theorizing in the Western context. It is possible that organizational ambidexterity influences the level of executive SHRM practices in that past performance of organizational ambidexterity may affect the level of executive SHRM in place (i.e., reverse causality). Thus, future research should adopt a longitudinal analysis in hope of identifying the causality between executive SHRM practices and organizational ambidexterity, although the difficulty in establishing such causality has remained the thorn in research of SHRM and firm performance for more than two decades.

HR deficiency is even more evident in managing top executives and talent, as many Chinese firms, driven by a quick-fix mentality, often resort to recruiting externally instead of building internal capability through developing an effective HRM system.

Third, this study treats executive SHRM as a system (e.g., Lin & Shih, 2008), rather than using its subcomponents (e.g., selective recruiting and training opportunities) to illustrate the mediating role of TMT effectiveness. However, it is possible that some subcomponents of executive SHRM have different impacts on TMT effectiveness. For example, it may be that training and development affect TMT effectiveness more strongly than selective staffing, although the overall effect can be positive at an aggregate level. Therefore, future research can extend the findings by investigating the impact of specific subcomponents of executive SHRM practices on TMT effectiveness.

Fourth, the majority of sampled firms in this study are state owned. Past studies (e.g., Peng, Tan, & Tong, 2004) documented differences

between state-owned and non-state-owned firms on aspects such as characteristics, strategies, and performance. With legitimacy and political backing to secure access to resources, state-owned firms do not concentrate on profit maximization and may be less motivated to be entrepreneurial and to leverage their resources to pursue superior performance (Peng et al., 2004). Although ownership structure was controlled in data analyses, future studies should generalize our results by testing our conceptual model with non-state-owned firms.

Finally, we adopted subjective measures of organizational ambidexterity and financial performance in this study. Even though prior research has concluded that subjective measures of firm performance are correlated with objective measures with a high degree of reliability (e.g., Venkatraman & Ramanujam, 1986), it is possible that there are gaps between subjective measures and the objective financial data released by firms. However, due to the low reliability of objective performance documentation released by Chinese firms (Peng & Luo, 2000), perceptual measures may be a preferred approach. Nonetheless, future research should deploy objective measures of organizational ambidexterity and financial performance to generalize the effect of an executive SHRM system on organizational ambidexterity. Besides, CEOs were not asked to answer measurement items of an executive SHRM system but those of TMT effectiveness. We provided two reasons to do so, which were to avoid common method bias and improve the accuracy of respondents' answers. To generalize the results of this study, future research should continue to investigate by also asking CEOs to rate items of an executive SHRM system.

Acknowledgments

This research was sponsored by the National Natural Science Foundation of China (No. 71372205, No. 71502142), Shandong University Fund (IFYT12063, 2015WLJH15) and was also supported by Research Center of State-Owned Assets Supervision & Administration Commission (SASAC). Opinions expressed in this paper represent those of the authors only.

Note

1. Additional regression analysis shows that the direct impact of knowledge–sharing intensity on exploration is positive and significant (β = 0.27, p < 0.01), indicating middle managers' knowledge sharing also provides the information needed for effective exploration activities. We thank the anonymous review for providing this issue.

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References

Ahammad, F. M., Lee, S. M., Malul, M., & Shoham, A. (2015). Behavioral ambidexterity: The impact of incentive schemes on productivity, motivation, and performance of employees in commercial banks, Human Resource Management, 54(Suppl. 1), s45–s62.

Allen, M. R., Ericksen, J., & Collins, C. J. (2013). Human resource management, employee exchange relationships, and performance in small businesses. Human Resource Management, 52(2), 153–173.

Atuahene-Gima, K. (2005). Resolving the capability: Rigidity paradox in new product innovation, Journal of Marketing, 69, 61–83.

Balogun, J., & Johnson, G. (2005). From intended strategies to unintended outcomes: The impact of change recipient sensemaking. Organization Studies, 26(11), 1573–1601.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. Journal of Personality and Social Psychology, 51(6), 1173–1182.

Becker, B. E., & Huselid, M. A. (1998). High performance work systems and firm performance: A synthesis of research and managerial implications. In G. R. Ferris (Eds.), Research in personnel and human resource management. Greenwich, CT: JAI Press.

Becker, B. E., & Huselid, M. A. (2006). Strategic human resources management: Where do we go from here? Journal of Management, 32(6), 898–925.

Beckman, C. M. (2006). The influence of founding team company affiliations on firm behavior. Academy of Management Journal, 49(4), 741–758.

Biemann, T., Cole, M. S., & Voelpel, S. (2012). Within-group agreement: On the use (and misuse) of R_{WG} and $R_{WG}(J)$ in leadership research and some best practice guidelines. Leadership Quarterly, 23(1), 66–80.

Bliese, P. D. (2000). Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis. In K. J. Klein & S. W. J. Kozlowski (Eds.), Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions (pp. 349–381). San Francisco, CA: Jossey-Bass.

Bliese, P. D., Halverson, R. R., & Schriesheim, C. A. (2002). Benchmarking multilevel methods in leadership: The articles, the model, and the data set. Leadership Quarterly, 13(1), 3–14.

Brislin, R. W. (1980). Translation and content analysis of oral and written material. In H. C. Triandis & J. W. Berry (Eds.), Handbook of cross-cultural psychology (pp. 389–444). Boston, MA: Allyn & Bacon.

Cao, Q., Gedajlovic, E., & Zhang, H. (2009). Unpacking organizational ambidexterity: Dimensions, contingencies, and synergistic effects, Organization Science, 20(4), 781–796.

Cao, Q., Simsek, Z., & Zhang, H. (2010). Modelling the joint impact of the CEO and the TMT on organizational ambidexterity. Journal of Management Studies, 47(7), 1272–1296.

Chang, S., Gong, Y., Way, S. A., & Jia, L. (2013). Flexibility-oriented HRM systems, absorptive capacity, and market responsiveness and firm innovativeness. Journal of Management, 39(7), 1924–1951.

Chang, S., Jia, L., Takeuchi, R., & Cai, Y. (2014). Do high-commitment work systems affect creativity? A multilevel combinational approach to employee creativity. Journal of Applied Psychology, 99(4), 665–680.

Chatterjee, D., & Ravichandran, T. (2013). Governance of interorganizational information systems: A resource dependence perspective. Information Systems Research, 24(2), 261–278.

Chen, G., Mathieu, J. E., & Bliese, P. D. (2002). A framework for conducting multilevel construct validation. In F. J. Yammarino & F. Dansereau (Eds.), Research in multilevel issues: Multilevel issues in organizational behavior and processes (Vol. 3, pp. 273–303). Oxford, England: Elsevier.

Chen, Y., Tang, G., Jin, J. F., Xie, Q., & Li, J. (2014). CEOs' transformational leadership and product innovation performance: The roles of corporate entrepreneurship and technology orientation. Journal of Product Innovation Management, 31(Suppl. 1), 2–17.

Chuang, C., & Liao, H. (2010). Strategic human resource management in service context: Taking care of business by taking care of employees and customers. Personnel Psychology, 63, 153–196.

Collins, C. J., & Clark, K. D. (2003). Strategic human resource practices, top management team social networks, and firm performance: The role of human resource practices in creating organizational competitive advantage. Academy of Management Journal, 46(6), 740–751.

Cooke, F., Saini, D., & Wang, J. (2014). Talent management in China and India: A comparison of management perceptions and human resource practices. Journal of World Business, 49(2), 225–235.

Davies, H., & Walters, P. (2004). Emergent patterns of strategy, environment and performance in a transition economy. Strategic Management Journal, 25(4), 347–364.

De Hoogh, A. H., & Den Hartog, D. N. (2008). Ethical and despotic leadership, relationships with leader's social responsibility, top management team effectiveness and subordinates' optimism: A multi-method study. Leadership Quarterly, 19(3), 297–311.

Faraj, S., & Sproull, L. (2000). Coordinating expertise in software development teams. Management Science, 46(12), 1554–1568.

Farh, J.-L., Hackett, R. D., & Liang, J. (2007). Individual-level cultural values as moderators of perceived organizational support–employee outcome relationships in China: Comparing the effects of power distance and traditionality. Academy of Management Journal, 50(3), 715–729.

Floyd, S. W., & Lane, P. J. (2000). Strategizing throughout the organization: Managing role conflict in strategic renewal. Academy of Management Review, 25(1), 154–177.

Floyd, S. W., & Wooldridge, B. (1992). Managing strategic consensus: The foundation of effective implementation. Academy of Management Executive, 6(4), 27–39.

Fu, N., Flood, P. C., Bosak, J., Rousseau, D. M., Morris, T., & O'Regan, P. (2015). High-performance work systems in professional service firms: Examining the practices resources-uses performance linkage, Human Resource Management. doi: 10.1002/hrm.21767

Gibson, C. B., & Birkinshaw, J. (2004). The antecedents, consequences, and mediating role of organizational ambidexterity. Academy of Management Journal, 47(2), 209–226.

Goodhue, D., Lewis, W., & Thompson, R. (2007). Statistical power in analyzing interaction effects: Questioning the advantage of PLS with product indicators. Information Systems Research, 18(2), 211–227.

Gupta, A. K., Smith, K. G., & Shalley, C. E. (2006). The interplay between exploration and exploitation. Academy of Management Journal, 49(4), 693–706.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2010). Multivariate data analysis. Upper Saddle River, NJ: Pearson Education.

Halevi, M. Y., Carmeli, A., & Brueller, N. N. (2015). Ambidexterity in SBUs: TMT behavioral integration and environmental dynamism. Human Resource Management, 54(Suppl. 1), s223–s238.

Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. Academy of Management Review, 9(2), 193–206.

He, Z.-L., & Wong, P.-K. (2004). Exploration vs. exploitation: An empirical test of the ambidexterity hypothesis. Organization Science, 15(4), 481–494.

Hui, C., Lee, C., & Rousseau, D. M. (2004). Psychological contract and organizational citizenship behavior in China: Investigating generalizability and instrumentality. Journal of Applied Psychology, 89(2), 311–321.

James, L. R. (1982). Aggregation bias in estimates of perceptual agreement. Journal of Applied Psychology, 67, 219–229.

Jansen, J. J., Tempelaar, M. P., Van den Bosch, F. A., & Volberda, H. W. (2009). Structural differentiation and ambidexterity: The mediating role of integration mechanisms. Organization Science, 20(4), 797–811.

Judge, W. Q., & Douglas, T. J. (1998). Performance implications of incorporating natural environmental issues into the strategic planning process: An empirical assessment. Journal of Management Studies, 35(2), 241–262.

Junni, P., Sarala, R. M., Taras, V., & Tarba, S. Y. (2013). Organizational ambidexterity and performance: A meta-analysis. Academy of Management Perspective, 27(4), 299–312.

Junni, P., Sarala, R. M., Tarba, S. Y., Liu, Y., & Cooper, C. L. (2015). Guest editors' introduction: The role of human resources and organizational factors in ambidexterity. Human Resource Management, 54(Suppl. 1), s1–s28.

Kuvaas, B., Buch, R., & Dysvik, A. (2012). Perceived training intensity and knowledge sharing: Sharing for intrinsic and prosocial reasons, Human Resource Management, 51(2), 167–187.

Lance, C. E., Butts, M. M., & Michels, L. C. (2006). The sources of four commonly reported cutoff criteria: What did they really say? Organizational Research Methods, 9, 202–220.

Law, K. S., Wong, C. S., & Mobley, W. H. (1998). Toward a taxonomy of multidimensional constructs, Academy of Management Review. 23(4), 741–755.

Lee, C. K. (2007). Against the law: Labor protests in China's rustbelt and sunbelt. Berkeley: University of California.

Lin, H.-C., & Shih, C.-T. (2008). How executive SHRM system links to firm performance: The perspectives of upper echelon and competitive dynamics. Journal of Management, 34(5), 853–881.

Lubatkin, M. H., Simsek, Z., Ling, Y., & Veiga, J. F. (2006). Ambidexterity and performance in small-to medium-sized firms: The pivotal role of top management team behavioral integration. Journal of Management, 32(5), 646–672.

Luca, L. M. D., & Atuahene-Gima, K. (2007). Market knowledge dimensions and cross-functional collaboration: Examining the different routes to product innovation performance. Journal of Marketing, 71(1), 95–112.

Marsh, H. W., Wen, Z., & Hau, K. T. (2004). Structural equation models of latent interactions: Evaluation of alternative estimation strategies and indicator construction. Psychological Methods, 9(3), 275–300.

Martell, K., & Carroll, S. J. (1995). Which executive human resource management practices for the top management team are associated with higher firm performance? Human Resource Management, 34(4), 497–512.

Martínez-del-Río, J., Céspedes-Lorente, J., & Carmona-Moreno, E. (2012). High-involvement work practices and environmental capabilities: How HIWPS create environmentally based sustainable competitive advantages, Human Resource Management, 51(6), 827–850.

National Bureau of Statistics of China. (2013). China statistical yearbook 2012. Beijing: China Statistics Press.

O'Reilly, C. A., & Tushman, M. L. (2004). The ambidextrous organization. Harvard Business Review, 82(4), 74–83.

Patel, P., Messersmith, J., & Lepak, D. (2013). Walking the tightrope: An assessment of the relationship between high-performance work systems and organizational ambidexterity. Academy of Management Journal, 56(5), 1420–1442.

Peng, M., & Luo, Y. (2000). Managerial ties and firm performance in a transition economy: The nature of a micro-macro link. Academy of Management Journal, 43(3), 486–501.

Peng, M. W., Tan, J., & Tong, T. W. (2004). Ownership types and strategic groups in an emerging economy. Journal of Management Studies, 41(7), 1105–1129.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. Journal of Applied Psychology, 88(5), 879–903.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. Behavior Research Methods, 40(3), 879–891.

Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. Multivariate Behavioral Research, 42(1), 185–227.

Raes, A. M. L., Bruch, H., & De Jong, S. B. (2013). How top management team behavioural integration can impact

employee work outcomes: Theory development and first empirical tests. Human Relations, 66(2), 167–192.
Raes, A. M. L., Heijltjes, M. G., Glunk, U., & Roe, R. A. (2011). The interface of the top management team and middle managers: A process model. Academy of Management Review, 36(1), 102–126.
Raisch, S., & Birkinshaw, J. (2008). Organizational ambidexterity: Antecedents, outcomes, and moderators. Journal of Management, 34(3), 375–409.
Rogers, P. R., Miller, A., & Judge, W. Q. (1999). Using information-processing theory to understand planning/performance relationships in the context of strategy. Strategic Management Journal, 20(6), 567–577.
Sheldon, P., Kim, S., Li, Y., & Warner, M. (2011). China's changing workplace: Dynamism, diversity and disparity. New York, NY: Routledge.
Simsek, Z. (2009). Organizational ambidexterity: Towards a multilevel understanding. Journal of Management Studies, 46(4), 597–624.
Smith, K. G., Collins, C. J., & Clark, K. D. (2005). Existing knowledge, knowledge creation capability, and the rate of new product introduction in high-technology firms. Academy of Management Journal, 48(2), 346–357.
Smith, W. K., & Tushman, M. L. (2005). Managing strategic contradictions: A top management model for managing innovation streams. Organization Science, 16(5), 522–536.
Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. In S. Leinhart (Eds.), Sociological methodology (Vol. 13, pp. 290–312). San Francisco, CA: Jossey-Bass.
Song, L. J., Zhang, X., & Wu, J. B. (2014). A multilevel analysis of middle manager performance: The role of CEO and top manager leadership CEO, Management and Organization Review, 10(2), 275–297.
Subramony, M. (2009). A meta-analytic investigation of the relationship between HRM bundles and firm performance. Human Resource Management, 48(5), 745–768.
Takeuchi, R., Lepak, D. P., Wang, H., & Takeuchi, K. (2007). An empirical examination of the mechanisms mediating between high-performance work systems and the performance of Japanese organizations. Journal of Applied Psychology, 92(4), 1069–1083.
Tang, G. Y., Chen, Y., Jin, J. F. (2015). Entrepreneurial orientation and innovation performance: Roles of strategic HRM and technical turbulence. Asia Pacific Journal of Human Resources, 53(2), 163–184.
Venkatraman, N., & Ramanujam, V. (1986). Measurement of business performance in strategy research: A comparison of approaches. Academy of Management Review, 11(4), 801–814.
Wang, S., & Noe, R. A. (2010). Knowledge sharing: A review and direction for future research. Human Resource Management Review, 20, 115–131.
Wei, L. Q., & Lau, C. M. (2010). High performance work systems and performance: The role of adaptive capability. Human Relations, 63(10), 1487–1511.
Wong, C. S., Law, K. S., & Huang, G. H. (2008). On the importance of conducting construct-level analysis for multidimensional constructs in theory development and testing. Journal of Management, 34, 744–764.
Wooldridge, B., Schmid, T., & Floyd, S. W. (2008). The middle management perspective on strategy process: Contributions, synthesis, and future research. Journal of Management, 34(6), 1190–1221.
Wright, P. M., Dunford, B. B., & Snell, S. A. (2001). Human resources and the resource based view of the firm. Journal of Management, 27(6), 701–721.
Wright, P. M., & Snell, S. A. (1998). Toward a unifying framework for exploring fit and flexibility in strategic human resource management. Academy of Management Review, 23, 756–772.
Zhang, X.-A., Cao, Q., & Tjosvold, D. (2011). Linking transformational leadership and team performance: A conflict management approach. Journal of Management Studies, 48(7), 1586–1611.
Zhao, X., Lynch, J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. Journal of Consumer Research, 37(2), 197–206.

APPENDIX A: TMT Member and Middle Manager Questionnaire

TMT member questionnaire

Executive SHRM system Lin and Shih (2008)	To what extent do you agree with the following statements (1 = strongly disagree to 5 = strongly agree)?
Selection	SE 1: The selection of TMT members in my firm reflects the applicant's propensity for teamwork.
	SE 2: The selection of TMT members in my company emphasizes the applicant's communication skills.
	SE 3: My company tends to select TMT members from current staff.
	SE 4: The selection of TMT members in my company emphasizes the applicant's breadth of perspective.
	SE 5: The selection of TMT members in my company emphasizes the applicant's industry-relevant knowledge and experience.
	SE 6: The selection of TMT members in my company emphasizes the applicant's experience in various job fields.
Compensation	CO 1: As compared with individual performance, pay level among TMT members in my company is relatively fair.
	CO 2: The pay raises for TMT members in my company are based on both merit and company tenure.
	CO 3: The bonus and reward decisions for TMT member in my company are based on both the company's overall performance and his or her department's performance.
	CO 4: As compared with the industry, the pay level of TMT members in my company is relatively high.
Training	TR 1: My company provides communication and problem-solving training programs for TMT members.
	TR 2: My company establishes rules or programs to help TMT members understand each other's operation processes and job duties.
	TR 3: My company frequently holds informal social activities for TMT members.
	TR 4: My company provides opportunities for TMT members to participate in cross-functional projects.
Performance appraisal	PA 1: The performance appraisal criteria for TMT members in my company put high weight on mutual support.
	PA 2: The performance appraisal procedure for TMT members in my company is specific.
	PA 3: Performance appraisal for TMT members in my company is fair and just.
	PA 4: Relative performance among departments has a decisive influence on the performance appraisal results for TMT members.
Developing teamwork climate	DTC 1: My company emphasizes a culture of cooperation and collaboration.
	DTC 2: My company has a clear development vision to guide the actions of TMT members.
	DTC 3: There is a mutual learning climate among TMT members in my company.
	DTC 4: There are a number of formal or informal communication channels among TMT members in my company.
TMT effectiveness De Hoogh and Den Hartog (2008)	To what extent do you agree with the following statements (1 = strongly disagree to 5 = strongly agree)?
	TMTE1: The TMT is a coherent entity that works consistently toward the official company goals.
	TMTE2: Members of the TMT of this company have a clear understanding of what this company's goal and mission is.
	TMTE3: The TMT is involved in all the important decision-making processes.
	TMTE4: The top managers work as an effective team.

APPENDIX A: (Contined)

Organizational ambidexterity Athuahene-Gima (2005)	Please indicate the importance of the following objectives regarding product development to your company over the last three years (1 = strongly disagree to 5 = strongly agree).
Exploitation	OA1: We have upgraded skills in product development processes where the firm already possesses significant experience.
	OA2: We have strengthened our knowledge and skills regarding projects that improve the efficiency of existing innovation activities.
	OA3: We have invested in enhancing skills to exploit mature technologies that improve the productivity of existing innovative operations.
Exploration	OA4: We have acquired manufacturing technologies and skills that are entirely new to the firm.
	OA5: We have acquired new technologies that are entirely new to the firm.
	OA6: We have acquired new innovation skills that are entirely new to the firm.
Middle manager questionnaire	
Knowledge-sharing intensity Faraj and Sproull (2000)	To what extent do you agree with the following statements (1 = strongly disagree to 5 = strongly agree)?
	KS1: If I have some special knowledge about how to perform the task, I am likely to tell TMT members.
	KS2: When I am asked about other areas of expertise by TMT members, I will not hesitate to tell them all I know.
	KS3: I actively participate in seminars or working groups within the company, and provide my own advices.
	KS4: I am always very busy with my own work, and cannot help TMT members to solve their problems (R).
CEO questionnaire	
Financial performance Judge and Douglas (1998)	The extent to which your firm's performance during the past two or three years, relative to all other competitors (1 = far below the average to 5 = far above the average)
	FP 1: Our profitability has been substantially better.
	FP 2: Our return on investment has been substantially better.
	FP 3: Our growth in market share has been substantially better.
	FP 4: Our sales growth has been substantially better.