DO INTERNAL LABOR MARKETS FORSTER OR HINDER ENVIRONMENTAL ADAPTATION?
THEIR IMPACT ON ORGANIZATIONAL KNOWLEDGE CREATION

A Thesis

Presented to the Faculty of the Graduate School

of Cornell University

In Partial Fulfillment of the Requirements for the Degree of

Master of Science

by

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December 2017

ABSTRACT

Many firms that once relied primarily on internal labor markets (ILMs), employment systems primarily governed by a set of organization-specific internal rules and procedures, have shifted to greater use of external markets to meet their employment needs. Some argue that ILMs have become an outdated HR strategy because the use of ILMs may inhibit the firms' capabilities to adapt to the changing environments. In this paper, I challenge that conventional wisdom and propose that ILMs have the potential to enhance a firm's adaptability to uncertain environments by facilitating its knowledge creation process. Drawing on panel data from 271 manufacturing firms, this study demonstrates that firms making greater use of ILMs in competitive industries exhibit more effective implementation of organizational learning practices – leading to higher knowledge creation.

BIOGRAPHICAL SKETCH

Hyesook Chung is a PhD student at School of Industrial and Labor Relations (ILR). She earned her Bachelor of Science degree from Cornell University, and her Master of Science degree in the Business School of Seoul National University. Her research focuses on human resource management and its roles in employee behaviors and organizational outcomes. Her specific interest is in how internal labor market practices influence organizational learning and thus knowledge creation of the firm. She also considers environmental factors, such as industry competitiveness and industry dynamism, as an important organizational context in the examination of the effects of human resource practices on organizational outcomes.

ACKNOWLEDGMENTS

I would like to thank my advisor and chair of committee, Dr. Rosemary Batt, for her patient guidance, encouragement and advice. I am grateful for her support whenever I was floundering in the process of writing my thesis. Her positive involvement has not only allowed me to achieve one of my academic goals but also to grow as an independent thinker. Her enthusiasm as a scholar will always inspire my academic career. I would also like to thank Dr. Diane Burton, another committee member, for her helpful feedback and suggestions. Her insight and questions have helped me to improve my thesis. Furthermore, I appreciate her positive energy that has rubbed off on me and kept me motivated.

Additionally, I would like to express my gratitude to the faculty of the Human Resource Studies department of ILR for urging me to think more deeply and critically. And many thanks to my special friends – Sangyun, JT, and Gail – for cheering me up and offering moral support along the way.

Finally, I would like to thank my parents and younger brother for their emotional support and unwavering belief in me; these have given me the power to move forward and endure in difficult times.

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INTRODUCTION

Internal labor markets (ILMs) are organization-level employment systems governed by internal operating principles, which underscore the custom, norms, and history of the organization. ILMs are usually characterized by the following features: long-term employment, internal promotion with limited ports of entry, extensive job-related training, and compensation tied to seniority (Doeringer & Piore, 1971; Osterman & Burton, 2006). ILMs received a great deal of attention from academics and practitioners who saw potential in them to contribute to organizational effectiveness via increased internal coordination and stability. For example, studies have shown that ILM practices help firms reduce employee turnover (Batt & Colvin, 2011), accumulate firm-specific knowledge and skills (Doeringer & Piore, 1971), and resolve agency problems (Williamson, 1975). In the new millennium, however, a question has surfaced: are the "golden days" of ILMs behind us?

In recent decades, firms confronting uncertain and competitive market conditions have started to avoid long-term employment and make greater use of external labor markets to meet their staffing needs (Cappelli, 1999). It has become increasingly difficult for them to predict which skills and knowledge will be useful in the future. As a result, employers have found it more efficient to hire knowledgeable workers from outside as needed, or just-in-time, rather than to internally train workers from the entry level and retain them over the course of their careers. In addition, to cope with volatile external environments, many employers have tried to achieve workforce flexibility through layoffs and temporary employment contracts (Casio, 1993, 2002).

Accordingly, some researchers argue that internal employment systems including ILMs are eroding as they deter the firms' capability to innovate in the face of "…rapid technological change, new production models, and new types of competition rooted in global, information-driven innovation processes (Block and Keller, 2009; Chesbrough, 2003; Reich, 1991)" (Benner & Mane, 2011: 325). From this perspective, firms' need to keep pace with fast-moving environments appears to make a good reason to avoid ILMs.

Despite the view that the use of ILMs is in decline, empirical evidence shows that the extent to which firms retain or reduce the utilization of ILMs actually varies to a considerable degree (Lee, 2015). Some firms have kept ILM practices while others have entirely abandoned them. This wide spectrum raises the question of why we observe such variation even today. Do those firms with ILMs persist as they are less vulnerable to external market pressures than their counterparts? Or did they just lose their momentum to adapt to the recent trends due to structural inertia? While those questions are worth investigating, I propose and explore another possibility: ILMs may enhance the firms' capability to create knowledge and thereby help them adapt to environmental changes. In this study, I posit that one of the appropriate strategies for dealing with fast changing environments is in fact to use ILMs rather than avoid them.

Ongoing knowledge creation is one thing that organizations should achieve to weather the turbulent environments (Grant, 1996; Kogut & Zander, 1992; Teece, Pisano, & Shuen, 1997). Yet, organizational knowledge does not autonomously emerge. In fact, it is highly difficult for a firm to build knowledge. There are non-negligible hurdles in the paths where individual employees' knowledge, the fundamental source of organizational knowledge system (March, 1991), is transferred, transformed, and stored in the firm. Because employees' contribution is crucial for the creation of organizational knowledge (March, 1991; Wang, He, & Mahoney,

2009), organizations should proactively encourage individual employees to engage in organizational learning practices by which they share personal knowledge and, simultaneously, learn from and contribute to the organizational knowledge system. However, inherent tacitness of individual knowledge (Polanyi, 1966) and potential misalignment between individuals' interests and those of the management (Wang, He, & Mahoney, 2009) inhibit employees from fully contributing to the organizational learning and knowledge creation processes.

Recognizing the existence of the above-mentioned difficulties, research on organizational knowledge creation (Nonaka, 1994; Nonaka & Takeuchi, 1995; Nonaka & von Krogh, 2009) suggests that an organization should form a social space, in which intimate and stable interpersonal interactions develop, to promote employees' active contribution to knowledge creation of the firm. Such a space facilitates exchange of ideas and transformation of tacit knowledge into explicit knowledge and vice versa. I propose that firms with ILMs are in a better position to build such a social space based on long-term and stable employment relationships. In addition, I expect that the positive impact of ILMs on organizational knowledge creation will be more salient in contexts where firms face a higher level of uncertainty and, thus, knowledge matters more. Data from 271 manufacturing firms support this expectation.

The findings of this study have theoretical and empirical implications. First, they counter to conventional wisdom that internal employment system is at odds with the changing competitive environment. Second, this present study extends the scope of our knowledge on ILMs, much of which has been centered on their emergence and antecedents (Lee, 2015). By examining the impact of ILMs on organizational learning and knowledge creation of the firm, however, this study aims to shed light on the consequence of ILMs. Finally, this study answers the call for further research on the process of organizational knowledge creation (Argote, 2011), which has

been insufficiently examined despite its theoretical importance in the organizational learning literature.

THEORY AND HYPOTHESES

Internal Labor Market

An ILM is defined as an employment system "within which the pricing and allocation of labor is governed by a set of [internal] … rules and procedures" instead of external market pressures (Doeringer & Piore, 1971: 1-2). The key features of ILMs include long-term employment relationships (Doeringer & Piore, 1971); entry at the bottom and movement through a job ladder, which leads to internal promotion and staffing (Althauser & Kalleberg, 1981); extensive job-related training (Doeringer & Piore, 1971; Pfeffer & Cohen, 1984); and seniority-based pay (Doeringer & Piore, 1971; Dulebohn & Werling, 2007; Gerhart & Rynes, 2003). Scholars have proposed that these features contribute to building firm-specific human capital (Becker, 1962), reducing bargaining problems between employers and employees (Williamson, 1975), solving difficulties of monitoring and enforcement (Gibbons & Waldman, 1999), and promoting perceptions of distributive justice (Doeringer & Piore, 1971).

Despite these potential benefits, firms have shifted away from internal labor markets. Instead, they increasingly rely on downsizing, temporary employment, and external hiring. These trends suggest that firms, at least in the U.S., have reduced their commitment to long-term employment relation by increasing their reliance on external labor market contracts (Abraham, 1990; Pfeffer & Baron, 1988). In addition, studies show that internal job ladders, a core feature of ILMs, have eroded considerably (Capelli et al., 1997; Cappelli, 2001).

Researchers have tried to identify factors that force firms to abandon ILMs, such as increased competition due to globalization and deregulation (Abowd & Lemieux 1993; Belzer,

1995; Card & Saunders, 1998) and rapid environmental changes due to technological advances (Reich, 1991). While the specific rationales for the declining use of ILMs vary, the underlying argument is that business environments are now much more uncertain and volatile than in the past; thus, firms cannot be shielded any longer from pressures arising from the external environments. From this perspective, internal employment systems may be regarded as a suboptimal strategy to maintain adaptability and competitiveness in the face of uncertain environments (Chesbrough, 2003).

Although the view that ILMs may be incompatible with today's dynamic world does hold theoretical and intuitive appeal, it may not be the whole story. It should be also noted that adapting to uncertain environments requires firms not only to respond to environmental feedback but also to *create* and *enact* new knowledge (Weick, 1988). Drawing from theories of organizational learning (Argote, 2012; Argote & Miron-Spektor, 2017) and knowledge creation (Nonaka, 1994; Nonaka et al., 2006), I propose that the use of internal labor market systems is valuable even in today's volatile world because they bolster the firm's capability to create new knowledge, an essential for organizational adaptation. In the following sections, I discuss the importance of knowledge creation in organizational adaptation and, subsequently, the roles ILMs play in the process of organizational knowledge creation.

Organizational Knowledge Creation and the External Environment

Organizational knowledge has been defined as, "…the validated understanding and beliefs in a firm about the relationship between the firm and its environment" (Smith, Collins, & Clark, 2005: 347). By contrast, organizational knowledge *creation* is defined as "the [active] process of making available and amplifying knowledge [initially] created by individuals as well as crystallizing and connecting it to an organization's knowledge system" (Nonaka & von Krogh,

2009: 635). Researchers consider organizational knowledge creation to be an essential process for organizations to adapt to environmental changes (Kogut & Zander, 1992; Nonaka & Takeuchi, 1995). It enables firms to develop new products (Dyck, Starke, Mischke, & Mauws, 2005; Flanagan, Eckert, Clarkson, 2007; Hoegl & Schulze, 2005; Schulze & Hoegl, 2006), improve information systems (Patnayakuni, Ruppel, & Rai, 2006), identify novel opportunities (Tsai & Li, 2007), increase firm performance (Helfat, 2000), and ultimately survive.

Firms competing in uncertain environments should not only be able to process information efficiently but also to create new knowledge (Smith et al., 2005). A central aspect of organizational adaptation is that a firm must proactively *extract* meaning from external information via interpretation and *reshape* the environment as well as the focal firm itself; through the enactment of the newly-created knowledge. From this perspective, organizational adaptation to the environment is "better understood as a process in which the organization creates and defines problems and then *actively develops new knowledge* to solve them" (Nonaka, 1994:14).

Individual Knowledge and Organizational Learning Practices

Not surprisingly, organizational knowledge creation does not occur automatically. Information becomes knowledge only after people interpret it and then give it meaning and value. In this regard, knowledge-creation necessarily depends on *who* participates and *how* they participate in these processes. Recognizing this, the literature on organizational knowledge has highlighted the core roles that individual employees and their social interactions play in generating and utilizing knowledge. Indeed, researchers have suggested that knowledge creation of the firm relies on heavily organizational members' exchange and the combination of information and ideas (Kogut & Zander, 1992, 1996; Wang et al., 2009). To achieve this, firms

invest a considerable amount of time and resources to develop and implement organizational learning practices (Haas, 2006). These practices, which "promote the effectiveness of creating, transferring, processing and utilizing of information and knowledge of firms" (Shipton, Fay, West, Patterson, & Birdi, 2005), have been regarded as a critical mechanism to facilitate knowledge creation of the firm by enhancing the firms' capability to synthesize and utilize individual employees' knowledge (Lado & Wilson, 1994; Laursen & Mahnke, 2001). Researchers have studied various organizational learning practices (Guthrie, 2001; Huselid, Jackson, & Schuler, 1997; Lau & Ngo, 2004; Laursen & Foss, 2003) such as mentoring and coaching, task rotation, on-the job training, quality circles, and a suggestion system.

Although organizational learning practices are meaningful predictors of organizational knowledge creation, the mere existence of such practices cannot guarantee a generation of new knowledge. This is due to the existence of inherent hurdles, which obstruct the paths through which knowledge is transferred between individuals and across organizational subsystems; they inhibit employees from engaging in organizational learning practices. Specifically, firms face two main hurdles. While one results from a misalignment of employees' interests and those of the organization, the other originates from the inherent characteristics of individual knowledge.

In the first place, employees may be reluctant to invest their efforts into organizational learning and knowledge creation processes, even if the organization as a whole needs them to do so. Although employees are supposed to work to achieve common organizational goals based on mutual coordination and cooperation, it is also true that they have their own personal needs and aspirations, which are not necessarily aligned with those of the organization (Simon, 1948). This misalignment between employees and the organization can keep employees from fully engaging in organizational learning practices; this is a problem that has been recognized from various

theoretical perspectives. Drawing from theories of human capital and asset-specificity, Wang, He and Mahoney (2009) argued that employees might begrudge investing time and efforts to develop organizational knowledge, which tends to be firm-specific to a considerable extent. In this situation, knowledge gained from engaging in organizational learning practices is not perfectly redeployable in other firms, and thus the investment made may not pay off in the external labor market (Williamson, 1985). If this is the case, employees can find it unattractive to contribute to the organizational knowledge creation process. Another inhibiting factor against employee engagement in organizational learning practices is within-organization competition among them. When employees engage in organizational learning practices, they are pressured to share their personal knowledge with other organizational members. In this process, individuals may want to limit contribution to the organizational learning practices because they might perceive knowledge sharing as an activity that depreciates the unique value of their own knowledge and, eventually, reduces their power and status within the firm (Von Korgh et al., 2000). In addition, this reluctance to share one's own knowledge with others can exacerbate with performance-based compensation scheme, under which employees may assume that sharing knowledge with others will decrease their pay and benefits due to a dissipation of the uniqueness of their contribution to the organizational performance (Osterloh & Frey, 2000).

Second, aside from the misalignment between individual and organizational interests, inherent characteristics of individual knowledge can obstruct effective implementation of organizational learning practices. A huge portion of individual knowledge is *tacit* (Nonaka & Takeuchi, 1995; Polanyi, 1983). This tacit nature of knowledge makes it difficult for organizational members to codify, transfer, and integrate knowledge. If knowledge stays at the individual level in a scattered and uncoordinated form, it can never become a valuable resource

from which the firm can benefit; instead, it should be shared, transferred, recombined, and transformed into new knowledge at the organization level for a firm to capitalize on it. Given its tacitness, however, it becomes quite costly for an individual employee to participate in organizational learning practices because s/he must invest a large amount of time and effort to transfer his or her own tacit knowledge to others and to understand the knowledge of others. The process often involves repeated demonstration of time-consuming behaviors as well as dialogues with others, with no guarantee of success.

In sum, although individual employees' proactive contributions to organizational learning practices is essential in the organizational knowledge creation process, the misalignment of interests and the tacitness of individual knowledge make it elusive for a firm to achieve its goals. In this regard, firms should find ways to alleviate the influence of inhibiting factors so as to continue to create knowledge and, ultimately, adapt to changing environments. In the following section, I propose that ILMs can serve as a mechanism to reduce the reluctance and costs that employees perceive in engaging in knowledge sharing and organizational learning practices and, consequently, promote organizational knowledge creation.

ILM as Catalyst for Employee Engagement in Learning Practices

Nonaka (1994) proposed that organizations should serve as a *social hub*, or an "ontological basis," for knowledge conversion—a core organizational knowledge creation process in which existing knowledge of individual employees is converted into new knowledge at the organization level. Building on this recognition, he highlights two factors as key catalysts in the organizational knowledge creation process: mutual trust and shared information within a firm. I propose that these two factors can better emerge when ILMs are in place.

First, ILMs promote the emergence and development of mutual trust, which increases employees' willingness to share their knowledge with others and to learn from them (Adler, 2001; Levin & Cross, 2004). An important feature of ILMs—long-term employment—constitutes a necessary condition for trust to form through repeated and long-lasting social interactions (Lee, 2015). In addition, ILMs allow employees to have a sense of belonging and in-group perception; this makes it easier for them to build trust (Inkpen & Tsang, 2005). Finally, ILMs engender trust not only among employees but also between them and the employer by making the employment contract collective and less vulnerable to opportunism from either side (Williamson, Wachter, & Harris, 1975).

Increased mutual trust under ILMs motivates employees to be involved in social interactions, to share knowledge by doing, and to reach out to and learn from each other when problems arise. This social context mitigates the perceived costs of interacting with others on the expectation that others will reciprocate in the future (Mayer, Davis, & Schoorman, 1995). In other words, with mutual trust, employees can regard the time and effort they currently invest in transferring their knowledge to others, or the organization, not as a cost they must personally absorb but rather as *an investment for the future*. Indeed, the cooperative social capital inherent in ILM structures can encourage(stimulate) employees to communicate ideas based on "ensuring mutual respect, trust, cooperative willingness, and strong community memberships" (Kang & Snell, 2009:76). In sum, mutual trust enables constructive knowledge *collaboration* (Nonaka, 1994; Schrage, 1990), making employees less affected by the proximal short-term costs incurred by participating in learning and knowledge creation processes.

Second, ILMs are well-situated to foster a common knowledge platform among organizational members and so lower the costs that organizational knowledge creation activities

incur for the employees. According to Osterman and Burton (2006), organization-wide customs and norms cast an overarching influence on members of a firm with ILMs. When employees internalize these customs and norms, they come to possess shared understandings and cognitive representation about their work and the organization. Based on this shared cognition, the employees can much better understand each other's goals and intentions at work as well as those of the management, which otherwise could have been idiosyncratic and heterogeneous. In addition, ILMs enable task-related information to propagate across different ranks by structuring the employees' careers around an internal job ladder; this allows a "progressive development of knowledge or skills" (Althauser & Kalleberg, 1981). As workers climb the organizational ladder, they gradually internalize knowledge ranging from what is required for entry-level positions to what is required for managerial ones. As a result, employees come to share a considerable amount of mutual understanding and work-related knowledge across the ranks. Finally, long and stable employment relationships help create strong and reliable interpersonal ties. This facilitates the accumulation of common experience as well as the emergence of a shared language, both of which are important elements of tacit knowledge sharing (Grant, 1996a, b; Kogut & Zander, 1992; Zucker, 1987).

Some might argue that shared information is detrimental to the creation of knowledge by increasing the redundancy of information and decreasing the cognitive diversity within a firm. This redundancy, however, can facilitate knowledge creation by allowing a smoother diffusion and integration of ideas. Redundancy of information refers to the existence of extra information shared by organizational members beyond the specific information required by each individual and each given task (Nonaka, 1994). With this redundancy or overlap of information, employees can sense more quickly and accurately what others are trying to articulate by entering each

other's cognitive areas and making to-the-point interpretations (Landau, 1969). Also, redundancy of information helps employees to find (create) effective metaphors and analogies. In this vein, shared information speeds shared concept creation and tacit knowledge transfer (Grant, 1996a, b). These mechanisms considerably reduce the costs of knowledge conversion and the transference that employees should take while engaging in learning practices.

All in all, a social structure based on internal labor market systems is likely to facilitate employees' engagement in organizational learning practices, in which organizational members code, share, and learn knowledge, not only with each other but also through the organizational knowledge system (Thite, 2004). Contributing to organizational learning becomes more attractive (higher willingness from mutual trust) and easier (lower costs from shared knowledge base) for employees in firms with robust ILMs than for those in counterparts without them. From this perspective, I propose that ILMs will be positively related to employee engagement in organizational learning practices and, ultimately, in organizational knowledge creation.

Hypothesis 1: ILMs are positively related to employee engagement in organizational learning practices.

Hypothesis 2: Employee engagement in organizational learning practices mediates the positive indirect effect of ILMs on knowledge creation of the firm.

Environmental Uncertainty and the Value of Organizational Learning Practices

Knowledge is basically context-specific. Consequently, the organizational knowledge creation process also tends to be affected by organizational contexts (Nonaka, Toyama, & Nagata, 2000). To address this context-specificity, I examine the influence of industry characteristics on the process of organizational knowledge creation. Specifically, I propose that

in competitive or dynamic industries organizational learning practices will demonstrate a more salient, positive influence on knowledge creation.

All else being equal, it is easier for a firm to build knowledge when the surrounding environment is certain, that is, a stable and non-complex environment, than when the environment is uncertain. In such relatively certain environments, interpreting and processing information become easy because information has a relatively lower level of noise. In addition, when the environment is stable, firms often obtain new knowledge by merely extrapolating from existing knowledge or imitating other firms. Thus, even without well-developed internal knowledge conversion or integration routines such as effective organizational learning practices, firms may be able to keep creating knowledge at a reasonable rate.

By contrast, consider an environment that is turbulent and complex. In this situation, it is quite difficult for a firm to create new knowledge by extrapolating from existing knowledge or by observing and modifying the knowledge of others because information is now highly noisy and inconsistent. Sirmon, Hitt, and Ireland (2007: 275) note that environmental uncertainty "… produces deficits in the information needed to identify and understand cause and effects relationships." To overcome the information deficits, decision-makers in the firm need to go through an arduous process of collecting, categorizing, cross-validating, and interpreting information. A single employee or team, however, cannot manage this whole process of information processing due to bounded rationality (Simon, 1947). That is why organizations segment information and tasks into manageable pieces and allocate them to multiple subunits (Simon, 1991). Yet, for this compartmentalization of information to work, the organization should have the capability to reintegrate locally processed information into global information to be used at the organization level. In this regard, the success of the division of labor in

information processing depends on effective implementation of organizational learning practices by which individuals share their institution and analysis, which build on tacit knowledge accumulated by their own work experience and learning-by-doing in the firm, and make them reincorporated and useful at the firm level. Thus, the value of the organizational learning process is highly appreciated in uncertain environments.

Against the above discussion, I propose that benefits from successful implementation of organizational learning practices will be more salient in uncertain environments than in certain ones. When an environment is relatively certain, the existence of internal process to facilitate knowledge management may not make a notable difference; the problems posed by the environment are too simple to differentiate the capability of the firms. However, if a firm operates in highly uncertain environments, in which knowledge creation is difficult to take place and rarely occurs by luck, organizational routines for learning and knowledge creation can make a practical difference for the focal firm (Grant, 1996a, b).

Industry competitiveness and dynamism are two characteristics that can pose uncertainty for firms. First, in competitive industries, firms compete for limited resources and positions in the market. This competition increases the extent of interdependence and thus the complexity of the entire market system. Firms in competitive industries, therefore, will experience environmental uncertainty with the elevated complexity (Ganco & Agarwal, 2009). Second, industry dynamism, which refers to the rate of change, volatility, and instability of the industry, is also likely to increase uncertainty of the firm (Hoskisson, Eden, Lau, & Wright, 2000; Jansen, Vera, & Crossan, 2009). High dynamism greatly discounts the present value of information firms already processed as information and knowledge very quickly get obsolete. In addition, because the relevance and validity of certain information tend to fluctuate even within a very short period

of time, firms also end up with far more coarse estimation of future value of specific information or knowledge in dynamic environments. This diminished value of unit amount of information makes it harder for organizations to plan ahead and make strategic decisions based on the environmental feedback. Thus, like those in competitive industries, firms that operate in dynamic industries face substantial environmental uncertainty (Sirmon et al., 2007).

I expect that employee engagement in organizational learning practices will make a bigger difference in knowledge creation for firms operating in competitive or dynamic industries. When the environment is relatively certain, inter-organizational heterogeneity in knowledge processing capability is less likely to make a difference because the bar to create knowledge is fairly low in this situation. However, the difference starts to emerge when the problems firms face become more difficult in the uncertain environments. From this perspective, I develop the following hypotheses that industry competitiveness and dynamism will positively moderate the relationship between employee engagement in organizational learning practices and knowledge creation of the firm.

Hypothesis 3a: Industry competitiveness will moderate the positive relationship between employee engagement in organizational learning practices and new knowledge created by the firm such that the relationship will be stronger under high industry competitiveness than under low industry competitiveness.

Hypothesis 3b: Industry dynamism will moderate the positive relationship between employee engagement in organizational learning practices and new knowledge created by the firm such that the relationship will be stronger under high industry dynamism than under low industry dynamism.

Integrative Model: Moderated Mediation

Finally, I propose an integrated model, in which the *indirect* effect of ILMs on organizational knowledge creation via employee engagement in learning practices is moderated by industry competitiveness and dynamism. I expect the second stage of the mediation (a path from employee engagement in learning to knowledge creation) to be positively moderated by the two environmental factors. I thus hypothesize that ILMs' positive indirect effect on knowledge creation will also be moderated by industry competitiveness and dynamism, such that the positive indirect effect will be stronger under either high industry competitiveness or high industry dynamism.

Hypothesis 4a: Industry competitiveness will moderate the positive indirect effect of ILM on knowledge creation via employee engagement in learning practices such that the indirect effect will be stronger under high industry competitiveness than under low industry competitiveness.

Hypothesis 4b: Industry dynamism will moderate the positive indirect effect of ILM on knowledge creation via employee engagement in learning practices such that the indirect effect will be stronger under high industry dynamism than under low industry dynamism.

METHODS

Data

To test the hypotheses, I used panel data from 271 manufacturing firms operating in South Korea. Specifically, I used the Human Capital Corporate Panel (HCCP) collected by the Korean Research Institute for Vocational Education. The objective of this panel survey is to identify whether firms maintain core capabilities, including human capital and knowledge capital, in the face of rapid environmental changes that firms encounter nowadays, such as

globalization and changes in customer demand and technologies changes. Thus, this survey includes the following questions: the objective employment records about human resource flows through recruitment and employee departures, the formal policy or HR philosophy regarding the employment system, HR practices, employee learning behaviors, and financial firm performance.

To reduce sampling bias, this institute used a stratified and random sample from the population of South Korean firms with more than 100 workers. As a next step, it dispatched a highly-trained expertise to the firms that agreed to participate in the survey and conducted a preliminary research to better know about the firms and to identify who is going to be the right person who answers for each section of the survey. After this preliminary investigation, an interviewer in the research institute revisited the firms and complete the questionnaires based on responses from employees in charge. The institute surveyed roughly 300 business firms for each data collection wave. I was also able to match the firms' identification number in the HCCP with their patent information from the Korean Intellectual Property Office (KIPO), the third-party agency that reports the number of patents registered by each firm every year. The corporate survey data was collected biyearly from 2005 to 2013, but I focused on panels in the years 2009 (n = 336), 2011 (n = 343), and 2013 (n = 320). These years mark the period of time when common structure and variable sets were used. Incomplete survey, missing archival data, and matching issues reduced the final sample to 761 firm-year observations from 271 firms in 22 sub-industries in the manufacturing sector.

Measurement

Knowledge creation. I used patent data to measure new knowledge created by the firms. Patent information has been widely used as a proxy for newly created knowledge and the output of innovative activities (Ahuja, 2000; Ahuja & Katila, 2001; Sorensen & Stuart, 2000). The sum

of patents registered for the two-year window (*t+1* and *t+2*: the following two years) was calculated to gauge the extent of organizational knowledge creation activity of the firm.

Internal labor markets (ILMs). I operationalized the ILM measure to include key features identified from prior studies. According to Osterman and Burton (2013), ILMs are most clearly distinguished by limited entry in hiring and robust internal job ladders. To capture these features, I examined whether the firm has a formal policy for filling its vacancies with internal employees ("The major way to meet the new workforce demand in our company is to retrain and redeploy existing employees rather than hiring from the external labor market."), internal job posting ("Our company uses a formal internal job posting practice by which to fill the job vacancies with internal applicants first.), and, finally, internal job ladders from entry level to top management ("Our company has a formal policy to foster internal employees for key managerial positions from the entry level."). While limited entry and internal career advancement is the most critical features of ILMs, there are other phenotypical characteristics that have been highlighted as indicators of ILMs in the literature. Secure and long-term employment relationship is one such representative feature of ILMs (Doeringer & Piore, 1971). Thus, I examined the firm's reliance on full-time employment as opposed to contractual or short-term employment by calculating the proportion of full-time workers in the company. Seniority-based pay is another feature frequently observed in ILMs (Doeringer & Piore, 1971; Dulebohn & Werling, 2007; Gerhart & Rynes, 2003). From this perspective, seniority-based pay was dummy-coded as 1 if the firm uses seniority as the basis for a portion of its compensation package. Finally, extensive job-related training also characterizes ILMs (Doeringer & Piore, 1971; Pfeffer & Cohen, 1984). To capture this, I measured per capita cost of training for new hires. After coding all the six variables, I

averaged z-scores of the variables to construct a composite index of ILM. Inter-correlations of the six index items are provided in Appendix.

While the elements of ILM index were derived from prior theories, it should be noted that using a composite index entails a potential risk that analysis results might be driven by only a part of index elements not reflecting the overall pattern. Thus, it is useful to examine the element-wise relationships with the dependent variable of interest and compare the results with the relation between the composite index and the dependent variable. I checked the element-wise relationships between ILM index variables and employee engagement in organizational learning practices, whose operationalization will be described below, with the same estimation methods and covariates as in the main hypothesis testing. The results are presented in Appendix. All elements except for seniority-based compensation and full-time employment showed positive connection with employee engagement in learning practices as expected.

Employee engagement in organizational learning practices. To measure how actively employees engage in organizational learning practices in which they exchange ideas and knowledge and learn from each other, I constructed a six-item scale of employee engagement in organizational learning practices ($\alpha = .74$) drawing from prior studies (Sung & Choi, 2014; Laursen & Foss, 2003). The items asked: "employees in our company actively engage in the following activities: (a) OJT (b) mentoring/coaching, (c) group learning, (d) task rotation among employees (e) quality circle, and (f) suggestion." HRM managers responded to these items using a 5-point scale where 0 represented "not actively at all" and 4 represented "very actively".

Industry competitiveness. I measured industry competitiveness using the Herfindahl-Hirschman Index (HHI), a commonly used measure of industry concentration, reported by the Korea Statistical Research Institute. High HHI means low industry competitiveness while low

HHI indicates high competitiveness with more distributed market power. The results remained consistent when I used the industry concentration ratio (CR), another frequently used indicator of concentration. Industry CR*k* refers to the percentage of the total market share concentrated in the top *k* firms in the industry. Specifically, I used CR3 (total market shares of top three firms). In this study, I report only the results from analyses using HHI.

Industry dynamism. Following prior studies (Boyd, 1990; Dess & Beard, 1984; Pathak, Hoskisson., & Johnson, 2014), I regressed gross revenue of each industry on year, and then divided the standard error of the "year" variable by the mean revenue of each industry to calculate industry dynamism. While prior studies usually used a five-year window, I used a four-year window due to the availability of more detailed industry classification by KSIC in those years.

Controls. I controlled for a series of factors that could affect both ILMs and knowledge creation capability or motivation of the firms. I controlled for the proportion of R&D workers in the total workforce because it may indicate the focal firm's capacity and motivation to create new knowledge. Also, I controlled for firms' general strategic attitudes towards new product development through a series of dummy variables (2 = [the company] leads the market with new products, 1 = observes and imitates the new products made by others, 0 = sticks to the existing products). This control variable considers the fact that firms involved in new product development as a routine tend to emphasize knowledge creation and obtain a patent. Overall strategic-orientation of the firm (Porter, 1980; 1 = differentiation, 2 = cost leadership, 3 = focus) was included as a control because firms pursuing a differentiation strategy tend to be more assertive in creating knowledge. In addition, I included a dichotomous variable reflecting the existence of HR practices to compensate employees for innovation at work (1= exists, 0 = does

not exist) as a covariate to control spurious effects of employees' motivation to commit to organizational knowledge creation beyond the effects of ILMs. Firms having a close relationship with other firms might benefit from the connection by obtaining the other firms' prior knowledge and experience. Hence, I controlled for whether the firm has other firms that officially transfer their technologies and skills to the focal firm (1: yes, 0: no) or has strategic alliances with others (1: yes, 0: no), which can serve as a source of knowledge acquisition (Ireland, Hitt, & Vaidyanath, 2002). I also controlled for stock market tradability of the firms. In general, publicly traded companies considerably differ from privately held companies in terms of their size and overall capabilities. To address this potential difference, I coded whether the firm is traded in KOPSI (Korea Composite Stock Price Index), KOSDAQ (Korea Securities Dealers Automated Quotation), or not publicly traded. The following variables were also controlled: firm age, firm size measured by the log of the total number of employees, and year fixed effects. Finally, to partial out industry-specific confounds, I included KSIC industry codes as dummy variables (22 sub-industries in the manufacturing industry; 11.23 firms per sub-industry).

Analysis

To test the hypotheses, I conducted panel analysis with random-effects model. I chose not to use the fixed-effects model, as it partials out all the organization-specific time-invariant effects, which arguably include a large portion of firm heterogeneity in ILMs—a long-lasting

TABLE 1. Descriptive statistics and correlations

		Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1	**Knowledge creation (lagged patent)**	24.37	235.81													
2	**Internal labor markets (ILMs)**	0.03	0.43	.11**												
3	**Employee engagement in learning practices**	0.00	0.66	.12***	.23***											
4	**Industry concentration (HHI)**	1647.66	952.89	.08*	-.02	.03										
5	**Dynamism**	0.06	0.07	.01	.00	-.01	.15***									
6	**Firm age**	35.21	16.87	.02	.08*	.06†	-.27***	-.17***								
7	**Firm size (log employee number)**	5.88	1.07	.37***	.21***	.41***	.03	-.04	.13***							
8	**RND worker proportion**	0.08	0.08	-.01	-.11**	.05	.12***	.03	-.09*	-.13***						
9	**Compensation for innovation**	3.26	0.45	.16***	.04	.37***	.05	-.05	-.03	.30***	.03					
10	**First mover**	0.30	0.46	.11**	.00	.19***	-.03	.01	.10**	.17***	.10**	.20***				
11	**KOSPI**	0.15	0.35	.07***	.07*	.14***	-.18***	.01	.45***	.29***	-.05	.09*	.07*			
12	**Differentiation**	0.20	0.40	.02	-.10**	.05	-.08*	.02	.05	.08*	.24***	.14***	.22***	.06†		
13	**Strategic alliance**	0.23	0.42	.17***	.09**	.23***	.03	-.03	-.01	.20***	.06†	.12**	.12***	.10**	.09**	
14	**Knowledge transfer from external organization**	0.16	0.37	.10**	.09**	.07*	.08*	.02	-.05	-.04	.06†	-.03	-.02	-.07†	-.04	.02

Note. N = 761. *** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .1$. Year-fixed effects and industry dummy variables are omitted for brevity.

organization-specific employment/HRM system. However, results from fixed-effects models were consistent with those from random-effects models. I used negative binomial panel analysis for equations with lagged patent counts as the dependent variable, to address the specificity of the count variable.

RESULTS

Table 1 presents descriptive statistics and inter-correlations of the variables used. Knowledge creation, measured by patent counts, had a positive zero-order correlation with ILM ($r = .11$, $p < .01$) and employee engagement in learning practices ($r = .12$, $p < .001$) as expected. In addition, knowledge creation of the firm was significantly correlated with several of the control variables in the expected direction: innovative compensation practices ($r = .16$, $p < .001$), strategic alliances ($r = .17$, $p < .001$), knowledge transfer from other firms ($r = .10$, $p < .01$), organizational emphasis on being the first mover in new product development ($r = .11$, $p < .01$), and firm size ($r = .37$, $p < .001$). Somewhat unexpectedly, however, the proportion of R&D workforce did not have a significant correlation with knowledge creation of the firm.

Table 2 contains the main test results based on random-effects panel regression (DV: employee engagement in organizational learning; Model 1 & 2) or negative binomial panel regression analyses (DV: knowledge creation; Model 3 - 7). Hypothesis 1 proposes a positive relationship between ILMs and employee engagement in organizational learning practices. In Model 2, ILMs were positively related to employee engagement ($b = 0.146$, $p < .01$). Thus, Hypothesis 1 was supported.

Hypothesis 2 predicts ILMs will have a positive indirect effect on organizational knowledge creation via employee engagement in learning practices as a mediating variable. Model 4 presents the second stage equation (M → Y: employee engagement in learning →

TABLE 2. Random effects panel analysis results

Variables	Model 1 Engagement In learning	Model 2 Engagement In learning	Model 3 Knowledge creation	Model 4 Knowledge creation	Model 5 Knowledge creation	Model 6 Knowledge creation	Model 7 Knowledge creation
Employee engagement In learning practices				0.131 (0.090)	0.706*** (0.158)	0.116 (0.109)	0.689*** (0.167)
Internal labor markets (ILMs)		0.146** (0.047)		-0.261** (0.114)	-0.223* (0.112)	-0.318** (0.119)	-0.275* (0.118)
Industry concentration (HHI)					-1.350 (1.693)		-0.929 (1.731)
Employee engagement x Industry concentration					-3.294*** (0.740)		-3.366*** (0.731)
Industry dynamism						1.232 (0.868)	0.827 (0.869)
Employee engagement x Industry dynamism						0.075 (0.800)	0.465 (0.784)
Firm age	0.000 (0.002)	0.000 (0.002)	0.001 (0.006)	0.001 (0.006)	0.001 (0.006)	-0.001 (0.006)	-0.001 (0.006)
Firm size (log)	0.182*** (0.029)	0.172*** (0.028)	0.322*** (0.069)	0.320*** (0.074)	0.429*** (0.077)	0.367*** (0.077)	0.471*** (0.078)
R&D worker proportion	0.871** (0.331)	0.901** (0.329)	0.926 (0.908)	0.781 (0.898)	1.003 (0.864)	1.036 (0.893)	1.185 (0.862)
Innovation compensation	0.244*** (0.049)	0.244*** (0.049)	0.040 (0.127)	0.015 (0.126)	-0.044 (0.123)	0.010 (0.127)	-0.059 (0.124)
First mover	0.100† (0.055)	0.100† (0.055)	0.469*** (0.142)	0.445** (0.143)	0.380** (0.141)	0.512*** (0.146)	0.449** (0.144)
Second mover	-0.002 (0.048)	-0.001 (0.047)	0.114 (0.132)	0.113 (0.132)	0.115 (0.129)	0.104 (0.137)	0.120 (0.133)
Cost leadership	0.017 (0.045)	0.018 (0.045)	0.196† (0.111)	0.196† (0.110)	0.166 (0.108)	0.213† (0.112)	0.175 (0.110)
Differentiation	-0.038 (0.055)	-0.020 (0.055)	0.097 (0.124)	0.074 (0.124)	0.135 (0.121)	-0.017 (0.129)	0.055 (0.127)
Strategic alliance	0.155*** (0.047)	0.152*** (0.047)	0.008 (0.105)	-0.014 (0.106)	-0.011 (0.102)	-0.064 (0.110)	-0.058 (0.106)
Knowledge transfer from external organization	0.115* (0.050)	0.101* (0.050)	-0.089 (0.129)	-0.082 (0.132)	-0.086 (0.129)	-0.119 (0.137)	-0.122 (0.135)
KOSPI	0.002 (0.074)	0.007 (0.073)	0.182 (0.203)	0.204 (0.203)	0.391* (0.202)	0.324 (0.203)	0.493* (0.203)
KOSDAQ	-0.032 (0.075)	-0.019 (0.074)	0.397† (0.228)	0.373† (0.226)	0.486* (0.223)	0.429* (0.221)	0.540* (0.220)
LR test statistic	Base model	9.662***		7.154*	21.145***	123.853***	124.245***

Note. N=761 (271 firms). *** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .1$. Standard errors are presented in parentheses. Model 1 and Model 2 results are from random effect panel regression. Results in Model 3 to 7 are from negative binomial panel regression.

knowledge creation) of the indirect effect path (X → M → Y: ILMs → employee engagement in learning → knowledge creation). When the direct effect of ILMs on knowledge creation (b = -0.261, $p < .01$) was controlled, the effect of employee engagement in learning practices (M → Y) was positive as expected, but not significant (b = 0.131, $p = .143$). This result implies that the indirect effect from ILMs to knowledge creation is not likely to exist as the second stage path does not relay the effect from the first stage (X → M). To further examine the mediating effect, I conducted bootstrapping (iteration: 1000) and derived bias-corrected confidence intervals, which do not depend on distributional assumptions. While the point estimate of the indirect effect was positive at 0.011, the bias corrected 95% confidence interval included zero (bias corrected 95% CI: -0.002, 0.083). Thus, Hypothesis 2 was not supported.

Hypothesis 3a proposes that the positive relationship between employee engagement in organizational learning practices and organizational knowledge creation will be positively moderated by industry competitiveness (recall that high concentration means low competitiveness whereas low concentration indicates high competitiveness). The interaction term was significant in Model 5 (b = -3.294, $p < .001$) as well as in Model 7 (b = -3.366, $p < .001$). Figure 1 presents the moderation effect of industry competitiveness by plotting simple slopes (1 standard deviation below and above the mean of industry competitiveness). As shown in the figure, the relationship between employee engagement in learning and knowledge creation of the firm was more positive when industry competitiveness was high. Thus, Hypothesis 3a was supported. Hypothesis 3b states that industry dynamism will also positively moderate the relationship between employee engagement in learning and knowledge creation of the firm. But the interaction term was significant in neither Model 6 (b = 1.232, $p = 0.925$) nor Model 7 (b = 0.827, $p = 0.553$). Hence, Hypothesis 3b was not supported.

FIGURE 1. Interaction of market competitiveness and learning practices

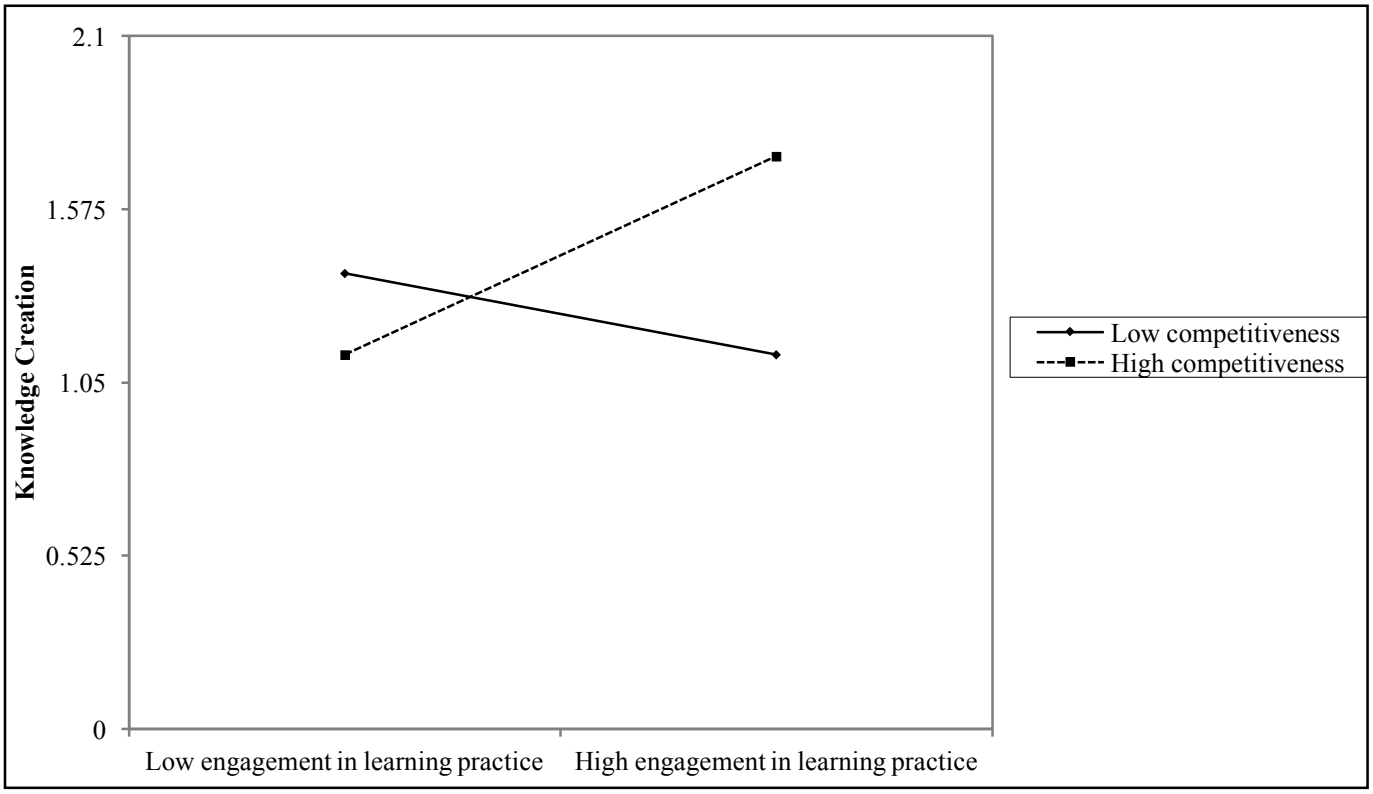

TABLE 3. Direct and Indirect effect of ILMs on organizational knowledge creation

	Direct Effect			**Indirect Effect**		
	point estimates	95% CI		point estimates	95% CI	
		lower	upper		lower	upper
Average competitiveness	-0.109	-0.389	0.091	0.009	-0.001	0.073
High competitiveness	-0.109	-0.389	0.091	**0.037**	**0.013**	**0.143**
Low competitiveness	-0.109	-0.389	0.091	-0.020	-0.070	0.035
Difference (High - Low)				**0.057**	**0.001**	**0.186**

Finally, Hypothesis 4a and 4b propose moderated mediation models such that the mediation effect from ILMs to knowledge creation will be positively moderated by industry contexts. Table 3 contains bootstrapping results of the moderated mediation, following the second stage (M → Y) moderation structure of the indirect effects presented in Edwards and Lambert (2007). I adopted the second stage moderation approach instead of the first stage one as I proposed that industry factors would moderate the relationship between employee engagement in learning and knowledge creation—the second stage of the entire indirect effect process. Table 3 presents both indirect and direct effects of ILMs on knowledge creation. The indirect effect was positive under high industry competitiveness (0.037; 95% bias corrected CI: 0.013, 0.143) while it was not significant under low industry competitiveness (-0.020; 95% bias corrected CI: -0.070, 0.035), containing zero. More importantly, the difference between the effects under the two conditions (low competitiveness vs. high competitiveness) was significant (0.057; 95% bias corrected CI: 0.001, 0.186). Therefore, Hypothesis 4a, which predicts that the indirect effect of ILMs on knowledge creation will be more positive under high industry competitiveness, was supported. According to the results from the indirect effect of ILMs on knowledge creation, one-unit increase of ILM index was associated with 7.1% increase in patent counts under the condition of high industry competitiveness. This effect did not occur in low industry competitiveness. Finally, Hypothesis 4b was not supported as the second stage relationship (employee engagement in learning→ knowledge creation) was not moderated by industry dynamism, as shown in the results in Model 6 and Model 7.

Robustness Check

A substantial portion of the sampled firms (59 firms out of 271) did not register any patent. I conducted an additional analysis to check whether this overrepresentation of zero patent

firms biased the statistical results of the study. Specifically, it is possible that the existence of many zeros in the dependent variable (i.e., patent counts) biased the results from the negative binomial analyses. To address this possibility, I conducted the same set of negative binomial panel regressions after dropping zero-patent firms from the sample. Even after excluding the 59 firms with no patent, the results remained consistent; as in the main analyses, the relationship between employee engagement in organizational learning and knowledge creation was not significant (b = -0.079, p = .315) but it was moderated by industry competitiveness (b = -3.003, p < .001).

DISCUSSION

Research on internal labor markets has had substantial influence on organizational sciences since the seminal work by Peter Doeringer and Michael Piore. Recently, however, many have come to view ILMs as an inappropriate organizational answer to the need for adaptation to changing business environments (Chesbrough, 2003). Contrary to this view, the results of the present study indicate that ILMs do aid in knowledge creation for firms under high industry competitiveness. To be specific, the positive effect of ILMs on knowledge creation was mediated by employee engagement in organizational learning practices, by which tacit and explicit knowledge of individuals can be incorporated into the organizational knowledge system. When industry competitiveness was low, the indirect effects were not significant. Yet, the indirect effects of ILMs on knowledge creation were significantly positive in competitive industries. These results imply that more nuanced understandings and further research on unexplored aspects are needed regarding the impact of ILMs in today's competitive business environments.

The idea that ILMs can be more beneficial in competitive environments runs counter to the existing assumption that ILMs engender cognitive homogeneity and rigidity that prohibit the

organizations from adapting to their environments. This assumption, however, needs to be reconsidered. First, having shared implicit perspectives resulting from ILMs does not always lead to a lack of creativity. As suggested above, it can instead accelerate an active sharing of knowledge which can give rise to creativity (Amabile & Khaire, 2008; Gong, Huang, & Farh, 2009). Second, according to Bowen and Ostroff (2004), consistency in organizational members' norms and cognition enhances both efficiency and effectiveness in the implementation of business strategies. By narrowing the gap between managerial intention and employees' interpretation, the firm can become more agile in making changes. Third, hiring is not the only way that an organization exchanges information with its environment. As suggested by Kang and Snell (2007), organizations as a learning system rely not only on the human capital of individual employees but also on the social capital and organizational capital of the organization to build knowledge. In sum, it may be a too simplistic view to equate ILM-based organizations with rigid and uncreative closed systems that are insulated from outside information and incapable of adaptation.

Unlike industry competitiveness, industry dynamism did not show a significant moderating effect on the relationship between employee engagement in learning practices and the knowledge creation of the firm. This is unexpected since active participation of employees in sharing and combining their knowledge is believed to increase the firm's speed in generating new firm-level knowledge, which is presumably more important in dynamic environments. According to Posen and Levinthal (2012), however, dynamic environments do not always justify the need for fast change or action. They showed that in a highly dynamic environment not only prior knowledge but also newly created knowledge become obsolete quickly. Thus, if an organization operates in a turbulent context, its efforts to build new knowledge by making

changes might result in a net loss of knowledge. In this case, action may be a losing strategy. In other words, firms might end up retaining more knowledge by focusing on existing routines rather than exploring new opportunities. In this regard, the proposed value of employee engagement in learning practices to enable a smoother processing of information and, subsequently, faster actions at the organization level, might greatly depreciate in a dynamic industry. This might explain why industry dynamism has not shown a significantly positive interaction with either employee engagement or ILMs. To gain a clearer understanding of this, however, more empirical investigation is needed.

Implications and Contribution

Empirical research on the strategic value of ILMs is quite limited (Lee, 2015). Prior studies have mainly attempted to elucidate antecedents of ILMs, rather than considering them as a predictor of organizational outcomes. Clearly, this approach has been useful to understand their emergence and evolution mechanisms. Osterman (2011: 637) states, however, "the existence of ILM rules is accepted ... and has been so at least since the publication of Doeringer and Piore's (1972) book on the subject." The next step is to "determine whether these rules are binding in the sense that they lead to *outcomes* that are different from those predicted by standard supply and demand models (Osterman, 2011: 636)". In looking at the outcomes of ILMs, the present study answers this call, along with a few others (e.g., Lee, 2015).

In addition, this study contributes to the literature of organizational learning by looking at a process of knowledge creation, which, with only a few exceptions, has been largely ignored (e.g., Smith, Collins, & Clark, 2005). While Nonaka and colleagues have emphasized the importance of knowledge creation in their conceptual frameworks, knowledge creation and its process have not been studied with due attention in the literature (Argote, 2011). By connecting

ILMs and employee engagement in organizational learning practices with knowledge creation by the firm, the present study contributes to our understanding of the organizational knowledge creation process in general as well as the potential influence of employment systems in the knowledge creation process.

Last but not least, this research provides a guideline for firms seeking continuous knowledge creation. Faced with highly competitive environments, they might be tempted to reduce, or even abandon, employment policies and practices based on ILMs. However, such firms should be aware of the social dynamics that can be created by ILMs. These practices promote employee learning building on cohesive employee relations and shared mental maps. From this perspective, if a firm primarily relies on the external labor market to cut labor costs and secure labor flexibility, it may unknowingly disrupt the process of knowledge creation and environmental adaptation, leading to the starkly different consequences from those intended.

Limitations and Future Agenda

This study has several limitations. First, in focusing on knowledge creation, I did not directly examine more ultimate organizational outcomes such as firm performance, competitive advantage, or survival. Future research should integrate such organizational effectiveness measures into the model to observe more distal impacts of ILMs. Second, to measure new knowledge created by the firm, this study used patent counts because more detailed information such as patent citation data was not available in the HCCP. While patent counts can indicate the extent of newly generated knowledge, it speaks only to quantity, not the quality or overall influence of the knowledge. Thus, I recommend that future studies address the issue not only of quantity, but also the quality of knowledge. Finally, it is possible that the results reported here

might not be applicable to firms in different nations or cultures. Future research should replicate the results in other settings.

Conclusion

In this thesis, I argued that internal labor markets —generally considered to be dated in today's business environments— can actually help firms better adapt to uncertain environments by facilitating their knowledge creation activities. The results of this study demonstrate that ILMs do help firms create knowledge by encouraging employees to contribute more proactively to organizational learning; this effect is stronger in competitive industries.

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Appendix. ILM index items

ILM Index Inter-Item Correlations

	1	2	3	4	5
1. Internal career advancement	–				
2. Internal job posting	-0.043	–			
3. Internal job vacancy fill	0.084*	-0.054	–		
4. Training for new hires	0.092 †	0.072	-0.038	–	
5. Seniority-based pay	0.025	-0.004	0.095	0.004	–
6. Fulltime workers	0.005	-0.074*	0.082	-0.006	-0.079*

Note. N=761 (271 firms). *** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .1$.

Item-wise analysis results: Employee engagement in learning practices as DV

Items	b
Formal policy for internal career advancement Our company has a formal policy to foster internal employees for key managerial positions from the entry level	0.037*
Internal job posting Our company uses a formal internal job posting practice by which to fill the job vacancies with internal applicants first.	0.040*
Fill a job vacancy with internal employees The major way to meet the new workforce demand in our company is to retrain and redeploy existing employees rather than hiring from the external labor market.	0.033 †
Seniority-based pay Our company uses seniority-based pay scheme.	-0.020
Training for new hires How much does your company invest in training for new hires? (Per Capita cost)	0.084**
Full time workers The proportion of full-time workers in the company	0.023

Note. N=761 (271 firms). *** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .1$