

Managing Internal and External Knowledge: Localization and Local Experience in Multinational Firms^{*}

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ABSTRACT

In an international context, we examine firms' strategic choices in the management of knowledge flow. Multinational firms can manage subsidiary knowledge flows by adjusting the level of "localization" in the top management – by sending expatriates to transfer internal knowledge or hiring local managers to source external knowledge. Drawing on a panel data of Japanese overseas subsidiaries across 18 host countries, we find

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that subsidiaries localized top management more when firms had less internal knowledge and when external knowledge sources were rich. Greater subsidiary and parent local experience altered these two main effects in opposite directions. These findings highlight nuances in firms' choices of how to manage knowledge flows in foreign markets.

Keywords: knowledge management, multinational firms, local experience, top management staffing

INTRODUCTION

Firms manage competitive advantage by balancing the use of existing capabilities against the search for new capabilities. Firms' capabilities have a substantial knowledge component, and the knowledge-based view highlights the importance of managing knowledge flows for the firms' competitiveness and strategic renewal (Agarwal and Helfat 2009; Grant 1996; Gupta and Govindarajan 2000; Kogut and Zander 1992; Mudambi 2002). The extant literature on international business explained that capability transfer, input localization, and output adaptation are the essence of a multinational firm's value creation from the host country (Cantwell and Mudambi 2005; Rangan and Drummond 2011). It is also widely accepted that successful knowledge base renewal depends on incumbents developing skills in both internal knowledge development and external knowledge sourcing (Almeida and Phene, 2004; Grigoriou and Rothaermel 2017; Helfat et al. 2007; Hoang and Rothaermel 2010).

Unique knowledge-based capabilities provide rents, but also leak to competitors over time, forcing firms to renew their knowledge bases (Levinthal and March 1993). Firms renew knowledge base with a combination of internal generation ("internal knowledge") and external sourcing ("external knowledge") (Capron and Mitchell 2009; Foss and Pedersen 2004; Luo 2002; Pamigiani and Mitchell 2009). Because it is hard to facilitate internal and external knowledge flows simultaneously (Andersson, Forsgren and Holm 2007; Mudambi 2011), the dual pressure forces firms to manage the inherent trade-offs between internal and external knowledge to maximize knowledge gains. Studies of this trade-off parallel research in strategy focusing on how firms prioritize flows and sources of knowledge (see Alcácer

and Chung 2007; Andersson, Forsgren, and Holm 2007; Arora, Belenzon, and Rios 2014; Cassiman and Veugelers 2006; Monteriro and Birkinshaw 2017; Zhang and Baden-Fuller 2010).

The management of subsidiaries not only presents major business challenges but also provides a foundation to understand the evolution of the multinational itself (Meyer, Li, and Schotter 2020; Rugman, Verbeke, and Nguyen 2011). Because subsidiaries of multinational firms are at the forefront of many international business challenges, firms entering new countries create a rich theoretical and empirical context for examining how firms manage the trade-off between internal and external knowledge sources. When firms cross borders, the nature of internal and external knowledge is relatively clear. Multinationals enter new countries by transferring and applying their pre-existing internal knowledge to their overseas subsidiaries in new geographic locations. Once abroad, these subsidiaries may encounter novel and potentially useful knowledge in their unfamiliar environments. Therefore, maximizing the benefits from these internal and external knowledge flows is essential for the success of subsidiaries and their parent firms.

Another advantage of examining multinational firms is the ability to observe their choices of specific knowledge management mechanisms. The knowledge management literature describes a system of transfer, acquisition, integration, and transformation through mechanisms composed of people, tasks, and tools (Argote and Ingram 2000; Grant 1996; Hedlund 1994). But existing studies leave unaddressed how firms employ a specific system in managing the internal and external knowledge flows. What conditions lead to what firm choices, and what firm choices lead to what outcomes? By examining multinational firms, we address the first question by explicitly examining choices that firms make to manage knowledge flows. We discuss how firms adjust a specific knowledge management mechanism as a function of different internal and external knowledge opportunities.

“Localization” is defined as conducting more value-added activities in the local environment and/or increasing the role of a value-added activity conducted in the local environment. Among people, tasks, and tools, we expect an essential mechanism of knowledge management to be top management staffing, specifically, the extent of localization – the proportion of local nationals versus expatriate in

the top management. Prior studies also defined multinational firms' localization as the extent to which expatriate managers are replaced by local nationals who are competent to perform the job originally held by expatriate managers (Law et al. 2009; Potter 1989; Selmer, 2004).

As a scarce strategic resource, firms' human capital should be carefully designed, and it is critical to have the right human resources into the right position (Edström and Lorange 1984; Gaur, Delios, and Singh 2007). Hymer (1970) long ago suggested the division of labor based on nationality as a solution to balance the need to coordinate and integrate foreign operations with the need to adapt to the different host country market conditions. Because the number of top management slots is limited, top management staffing with expatriates or locals has distinct trade-offs. While local managers should facilitate the acquisition of external knowledge, the lack of expatriate managers may undermine the effectiveness of internal knowledge transfer (Belderbos and Heijltjes 2005; Tan and Mahoney 2006).

On the one hand, expatriate managers constitute an important internal resource within the multinationals' global network. Expatriate managers help an overseas subsidiary initially transfer firm-specific knowledge from the parent firm and then subsequently contribute to maintaining internal consistency by ensuring a subsidiary's compliance with the parent firm's organizational value and operational priorities (Bartlett and Ghosal 1998; Boyacigiller 1990; Delios and Björkman 2000; Edström and Galbraith 1977; Harzing 2001; Tao et al. 2018). On the other hand, local top managers enhance the subsidiary's familiarity with the local environment and improve external legitimacy so that the subsidiary can search and gain critical local knowledge and resources from the host country more effectively (Gong 2003; Harzing 2001; Kobrin 1988; Tung 1982). Even though firms could obtain local knowledge from additional external sources (e.g., local consulting), a substantial part of local knowledge is tacit in nature and thus can be best learned and internalized through their own experience (Luo and Peng 1999). Therefore, prior studies emphasized that local knowledge cannot be completely transacted outside and must be embodied in a managerial position (Tan and Mahoney 2006; Tao et al. 2018).

We expect that a subsidiary's top management team composition

will reflect the strategic trade-off between the effective transfer of internal knowledge and the active augmentation of external knowledge from the host environment. In this study, at the time of entry and over time, we examine firms' strategic choices by looking into the composition of top management of their subsidiaries – the proportion of expatriates from the home country versus that of local managers from the host country.

Besides top management composition, knowledge flows in and out of a firm through other people-, task-, and tool-related mechanisms: employee mobility, technical exchange among scientists/engineers, supplier relationships, and technology embedded in tools (Argote and Ingram 2000; Song, Almeida, and Wu 2003), and the nature of these channels affects the quantity and quality of knowledge received by the target (Mudambi, 2002). While prioritization of internal versus external knowledge is a strategic decision reflected throughout multiple channels, we focus on top management staffing because of their pre-eminent role in executing organizational policies and practices over the multinational firms' global network (Delios and Beamish 2001; Gaur, Delios, and Singh 2007; Gong 2003; Jensen and Szulanski, 2004; Minbaeva et al. 2014; Tan and Mahoney 2006; Tao et al. 2018; Wang et al. 2009).

We suggest three factors will affect how firms prioritize internal versus external knowledge, and therefore decide on the extent of top management localization: (1) the firm's existing stock of internal knowledge, (2) the stock of external knowledge available in the new country location, and (3) the subsidiary's and parent firm's accumulated local experience in the host country location. Specifically, by combining the experiential learning perspective to the current knowledge-based view, we also expect that firms' local experience, accumulated by operating in the new host country environment, will alter the baseline relationships on the knowledge flow. It is due to a firm's greater ability to reduce the costs and uncertainties of the foreign market and improve alternative knowledge management mechanisms in managing knowledge flows.

Prior studies suggest that increased local experience can aid multinational firms to overcome the liability of foreignness, thus triggers the firm's greater commitment to the particular host country market (Eriksson et al. 1998; Henisz and Delios 2004; Johanson and Vahlne 1977; Zaheer 1995). As multinational firms' local experience increases, the deeper region-specific knowledge

connections help them formulate and adjust host country market strategy accordingly, leading to smoother knowledge management and more effective learning in their overseas subsidiaries (Lane, Salk, and Lyles 2001; Li and Fleury 2020).

Multinational firms accumulate local experience as a gradual process at both the subsidiary and parent firm levels, potentially with disparate effects on how firms manage the knowledge flows. At the subsidiary level, as an overseas subsidiary accumulates more experience in a host country, its focus shifts from transferring internal knowledge from the parent to acquiring external knowledge from the local environment. At the parent firm level, the parent accumulates local experience with each new subsidiary in a host country. Each subsidiary experiments with the collection of knowledge management mechanisms, thus possibly finding improvements. The parent then collects and cross-fertilizes individual subsidiaries' improvements. These improvements make subsidiaries of more experienced parent firms less dependent upon any particular knowledge management mechanism – in our case, top management staffing of either expatriates or local managers.

THEORY AND HYPOTHESES

Knowledge Trade-off for and Overseas Subsidiaries' Top Management Staffing Decision

Multinational firms compete abroad based on their internal stock of intangible knowledge – firm-specific, knowledge-based skills in the form of technical, managerial, and/or organizational know-how (Hymer 1976). Intangible knowledge stock, which supports the knowledge-based view of competitive advantage (Grant 1996; Kogut and Zander 1992), can be the reason why a firm competes successfully and the product of successful competition. Multinational firms try to transfer and protect intangible knowledge by “internalizing” their value-added activities abroad, owning and controlling foreign activities within the firm boundaries (Almeida, Song, and Grant 2002; Andersson and Gatignon 1986; Buckley and Casson 1976). Therefore, firm-specific explanations such as the depth of the firm's internal knowledge base have also been documented as one of the main drivers of the internal knowledge

sourcing (Zhang and Baden-Fuller 2010).

When multinational firms transfer and leverage their own internal knowledge, they tend to rely on expatriate managers whom they dispatch to overseas subsidiaries. As expatriate managers act as flexible repositories of knowledge, they are also able to adapt existing knowledge base to an unfamiliar environment (Argote and Ingram; 2000). Prior studies showed that multinational firms with strong marketing or technological capabilities are likely to use more expatriates to transfer these capabilities to overseas subsidiaries than firms without such capabilities (Belderbos and Heijltjes 2005; Delios and Björkman 2000; Doz and Prahalad 1986; Edström and Galbraith 1977; Harzing 2001; Law et al. 2009; Tan and Mahoney 2003; 2006; Wang et al. 2009). Since most expatriates are internal transfers rather than recent hires, they are likely to have accumulated firm-specific knowledge throughout their tenure at parent companies. Since multinational firms with higher internal knowledge stocks prioritize transferring internal knowledge when expanding abroad, we expect less localization of top management in their overseas subsidiaries.

H1: The greater the firm's internal knowledge stocks, the less the firm will localize top management.

Multinational firms expanding abroad also face opposing pressure to hire local managers – to increase the localization of their top management. To tap into new ideas and technology, multinational firms need to increase their capability of external knowledge sourcing. However, gaining access to external knowledge base is far from straightforward because there are significant institutional, technological, and geographical boundaries to overcome (Monteriro and Birkinshaw 2017). Multinational firms also suffer from an informational gap about significant differences in the market, institutional, social/cultural, and other norms that may affect its competitiveness in the foreign market (Zaheer 1995). By hiring locals as top managers, multinational firms can overcome this information gap more quickly.

The benefits of localization can be greater as the potential advantage to plug into local centers of technological competence increases. Thus, multinational firms' localization decisions are also affected by the external knowledge stock available in a specific

location. Firms can seek novel external knowledge located abroad that is created by differences in initial endowments, industry structures, and national innovation systems across countries (Cantwell 1989; Furman et al. 2002; Shan and Song 1997; Song, Asakawa, and Chu 2011). As a result, firms from different nations may compete in the same industry using different knowledge base. For example, in pursuit of greater fuel efficiency, U.S. automobile makers investigated fuel cell and electric-only vehicles. In contrast, European makers focused on diesel engines, and Japanese makers developed gas/electric hybrids. While technical knowledge is the easiest to observe, nations also develop unique managerial and organizational knowledge that overseas competitors may find hard to imitate.

The differences between knowledge stock in various countries provide an arbitrage opportunity for firms that want to diversify their capabilities or simply catch up with competitors, especially when the capabilities they seek cannot be fully exchanged through the marketplace. To become adept at tapping into the new knowledge base, multinational firms' overseas subsidiaries must become the "eyes and ears" of the multinational firms by sensing and acting on ideas picked up in their local market (Myer, Mudambi, and Narula 2011) and the skills required for absorbing external knowledge and resources significantly differ from those for internal knowledge transfer from the parent headquarter to overseas subsidiaries (Hansen 1999).

Localization can help firms capture novel external knowledge in several ways. First, a multinational subsidiary with more local top managers has a greater opportunity to identify novel external knowledge. For arriving multinationals relatively ignorant of the local environment, knowledge of opportunities is a crucial antecedent to any external knowledge acquisition. Locally hired top managers (as opposed to expatriate managers) are likely to know such useful external knowledge. Second, local top managers can facilitate the acquisition and assimilation of external knowledge. Local managers may hold useful knowledge themselves, or if useful knowledge is available among their contacts, be a conduit to knowledge holders. Third, local top managers help enhance a multinational subsidiary's legitimacy, facilitating greater access to knowledge embedded in local sources. Knowledge transfer typically requires the involvement, or at least the acquiescence of both the receiver and the source.

Local top managers can help overcome reticence on the part of knowledge sources. To sum up, in locations featuring more novel external knowledge, we expect firms to hire more local top managers to increase the acquisition of knowledge. Stated more formally:

H2: The greater the potential for external knowledge in the new environment, the more the firm will localize top management.

Local Experience and the Knowledge Tradeoff

Drawing on the experiential learning perspective (Argote, Beckman, and Epple 1990; Levitt and March 1988), we also expect that multinational firms with more local experience will improve their knowledge management mechanisms via top management staffing as well as through other people-, task-, and tool-related mechanisms.

Multinational firms accumulate experience at both the subsidiary and parent firm levels. Interestingly, we expect local experience at the subsidiary and parent levels to have counteracting effects on the subsidiary's top management localization. When prioritizing internal or external knowledge, we expect experienced subsidiary should respond more to the external knowledge opportunity by increasing top management localization. In contrast, subsidiaries having more experienced parent are better position to develop alternative knowledge management mechanisms besides top management staffing, which reduces the impact of internal and external knowledge stock on the level of top management localization.

At the subsidiary level, as a firm accumulates more local experience, the subsidiary's focus will naturally shift from transferring internal knowledge to acquiring external knowledge from the host country market. When a multinational's competitive advantage relies upon intangible knowledge, the parent will naturally push to impart these intangibles to its subsidiaries as completely and quickly as possible. However, once this initial push is over, the role of expatriate managers will become marginal and subsidiaries are motivated to more actively engage in augmenting new knowledge from the host counties (Fang et al. 2010; Tao et al. 2018). Luo and Peng (1999) show that local managers can gradually gain tacit and firm-specific knowledge through daily experiential learning from expatriates. Gong (2003) also argues that

as local managers gain more knowledge through learning-by-doing, control via expatriates becomes less important for the subsidiary's performance. This shift will be further encouraged by the high cost of displacing expatriate managers relative to that of hiring local managers (Tan and Mahoney 2003).

In transferring internal knowledge from the parent, expatriates will be supported by other people-, task-, and tool-related mechanisms, which with increasing efficacy, may eventually eclipse expatriates' role in transferring and integrating internal knowledge. Also, obsolescing expatriates' knowledge base is the fact that the parent company may develop new internal knowledge over time that to which expatriates are not privy due to their location abroad. This improvement of other mechanisms and the obsolescing of expatriate managers' personal knowledge may render the presence of expatriates in the host country less critical over time. It is also consistent with recent research findings showing that the importance of expatriates varies depending on the different growth stages of a subsidiary or the level of subsidiary autonomy (Fang et al. 2010; Gaur, Delios, and Singh 2007; Tao et al. 2018).

With the need to transfer internal knowledge via top managers eased, the subsidiary can shift towards leveraging the expertise of top managers to search and augment new external knowledge. The subsidiary's accumulated local experience helps firms lessen the barriers to access valuable external resources and foster a higher level of involvement and organizational learning in the local market environment (Gammelgaard et al. 2012; Lane, Salk, and Lyles 2001; Law et al. 2009; Rangan and Drummond 2011; Selmer 2004; Tao et al. 2018). Therefore, we would expect that as a subsidiary accumulates more local experience, the subsidiary's focus shifts as the role of expatriate managers become less pivotal, and the specifics of external knowledge opportunities solidify. Stated more formally:

H3: The more the subsidiary firm's local experience, the smaller the negative effect of internal knowledge and the greater the positive effect of the potential external knowledge on the subsidiary firm's localization of top management.

A multinational firm also accumulates local experience at the parent firm level as the firm enters the same country repeatedly

with multiple subsidiaries (Chang 1995; Chung and Song; 2004; Kogut 1983; Song 2002). This experience with earlier subsidiaries aids the performance of subsequent subsidiaries; subsidiaries can share research, investment, and personnel (Ghoshal, Korine, and Szulanski 1994). Information spillover (Shaver, Mitchell, and Yeung 1997) may then confer greater scale and scope economies (Chung and Song 2004).

We expect the greater parent-level local experience to relieve the knowledge trade-off that subsidiaries face in the process of top management localization. In particular, when a parent firm has multiple subsidiaries in a host country, these subsidiaries have the potential to improve all people-, task-, and tool-related knowledge management mechanisms through experimentation, not just top management localization. More importantly, the parent firm should become more adept at collecting and cross-fertilizing these improvements from individual subsidiaries to other subsidiaries in the same host country. Thus, as the parent accumulates more experience through each new subsidiary, the parent and its subsidiaries will become more adept at using all their knowledge management mechanisms, becoming less reliant on any particular knowledge mechanism – in our case, top management staffing.

Prior research also shows that accumulated local experiences of a parent company save additional management costs, because they act as mechanisms that reduce cultural challenges and lessen the operational burdens from the corporate parent (Shenkar 2001; Slagen and Hennart 2008; Tao et al. 2018). In circumstances of sequential entry into the same host country, application of the initial set of knowledge management mechanisms from the parent will necessarily vary in each subsidiary. For example, one subsidiary may use more local top managers and another subsidiary may focus more on reporting systems or other mechanisms related to people, tasks, and tools. This experimentation may generate improvements to the initial mechanisms received from the parent. Potential differences in industry, organization, and personnel may change how each subsidiary pursues knowledge transfer and acquisition.

With multiple subsidiaries generating potential improvements, cross-fertilization of these improved knowledge management mechanisms will increase with parent-level local experience. The parent may develop a set of routines for imparting knowledge to its subsidiaries, and these routines themselves would get better

as the more times the parent exercised them. Also, increasing the number of subsidiaries translates into better cross-fertilization. More subsidiaries lead to more potential improvements, which leads to more use and refinement of cross-fertilization routines. It implies that with accumulated local experience, knowledge transmission channels have gradually become more institutionalized (Fang et al. 2010; Gong 2003). Thus, by virtue of greater local experience from the parent, all subsidiaries become less reliant on any one particular knowledge management mechanism.

To sum up, the greater parent-level experience provide alternative sources and opportunity to improve various mechanisms in managing knowledge flows, making their subsidiaries less reliant on top management staffing – either expatriate or local managers. This latitude eases the knowledge trade-off between internal versus external knowledge presented by top management staffing. Stated more formally:

H4: The more the multinational parent firm's local experience in the new environment, the smaller the negative effect of internal knowledge and the smaller the positive effect of the potential external knowledge on the subsidiary firm's localization of top management.

METHODOLOGY

Data

We test our expectations using subsidiary firms of Japanese multinationals during the 1990s in the electronics industry, which corresponds approximately to the 2-digit U.S. SIC classification of "36: Electronic and other electrical equipment and components". This empirical context is suitable for several reasons. First, electronics is an R&D-intensive industry in which knowledge is important to firm success. Second, while Japanese firms were a major force in this industry during our study period, strong competitors also originated in Europe, North America, and other Asian nations, suggesting that knowledge in both Japan and abroad was important. Third, Japan was responsible for a large percentage of total world outward foreign investment in the 1990s, with a

heavy emphasis on electronics. Thus, this period of expansion abroad is an empirical context in which Japanese firms were both transferring internal knowledge abroad and were being exposed to new knowledge abroad.

Data are drawn from the Electronic Industries Association of Japan's (EIAJ) *Kaigai Hojin Listo* (Annual Directory of Overseas Subsidiaries). Our dependent variable is the fraction of host country nationals in a subsidiary's top management team. We believe this is an appropriate measure for two reasons. First, the extent of local staffing is theoretically consistent with localization. Localization represents the extent to which a certain element of business operations such as R&D, purchasing, manufacturing, or marketing is performed in the host country (Jarillo and Martinez 1990), or what proportion of activity is conducted in the local environment. In terms of top management team staffing, having more expatriate managers means less localization, while hiring more local managers means greater localization. Second, subsidiary top management staffing is a strategic choice that is consistent with the knowledge trade-off firms make in new environments. More expatriate managers are likely to reinforce and transfer the parent firm's current knowledge, while more local managers aid in the acquisition of external knowledge. Local managers can function as intermediaries to external knowledge embodied in other local employees, firms, and institutions.

Our data cover the period from 1991 to 1995. While this is a limited number of years and somewhat dated, the information is unique in terms of the insight it can provide into firm choices. To our knowledge, no other source provides data with sufficient detail to assess firm choices regarding a specific knowledge management mechanism – in this case, the extent of top management localization. The EIAJ directories are normally restricted to the association's corporate members. However, for the purposes of this study, the association gave one of the authors access to annual data for a limited number of years. The time period was selected to capture the large amount of Japanese foreign direct investment occurring in that period.

The average number of top management positions reported by subsidiaries in our data is 5.50, which means that these are primarily top C-suite positions: the C.E.O., C.F.O., C.O.O., and C.I.O. The average number of these positions filled by Japanese expatriate

managers is 1.81. Our measure varies by firm-year, with the highest value set at one when all of a subsidiary's top management positions are occupied by local nationals, and zero when all top managers are composed of expatriates from the parent firm's home country.

Other subsidiary-level data are also drawn from EIAJ's *Kaigai Hojin Listo*. Parent company and host country data are drawn from multiple issues of the Toyo Keizai's *Kaigai Shinshutsu Kigyo Soran* (Japanese Overseas Investment). Variables at the parent company level are also supplemented by the *Japan Company Handbook*.

For our five-year period, we have a balanced panel dataset of 207 manufacturing subsidiary firms belonging to 75 Japanese multinational parents, yielding 1,035 firm-year observations. These 207 affiliates are distributed across 18 host countries, with the U.S having the largest share (15%), followed by Taiwan (14.5%) and Malaysia (13%). Our data include both wholly-owned subsidiaries and joint-ventures.

Measures

For our focal independent variables, there are three categories: (1) the parent firm's stock of intangible knowledge, (2) the potential for novel knowledge in the subsidiary's host country environment, and (3) the subsidiary firm's and parent firm's local experience accumulated in the host country.

To reflect a subsidiary firm's stock of internal knowledge ("internal knowledge"), we use the parent firm's R&D intensity, measured as R&D expenses divided by sales. We assume that the subsidiary will inherit knowledge from the parent because leveraging that knowledge is one of the primary reasons that multinational firms establish subsidiaries rather than licensing their knowledge to others. R&D intensity is a standard measure used to reflect intangibles (Morck and Yeung 1991). While R&D intensity reflects technical intangibles, we believe it can also be used as a more general proxy for managerial and organizational intangibles. Spending relatively more on R&D than other same-industry firms could indicate a well-run firm in general, consistent with greater managerial and organizational intangibles. This measure varies by firm-year.

To represent the potential for external knowledge ("external knowledge") in the subsidiary's host country environment, we use

an indicator of the country's technological richness: the annual number of patents granted in the electronics industry by the U.S. Patent Office. The U.S. patent system is the most important in the world for establishing intellectual property rights (even outside of the U.S.). Therefore, significant innovations tend to have U.S. patents regardless of where the innovation originates (Furman *et al.* 2002). This count varies by country-year. Instead of the raw counts, we use the log values, recognizing that the annual count of patents granted in the electronics sector differs significantly across countries – some have dozens, and some have thousands. While these country differences will be absorbed by our subsidiary level effects, the magnitude of annual changes – which our measure will be captured due to our inclusion of subsidiary-level fixed effects – will also be substantially different. Thus, the log transformation will be required.

We refer to the amount of experience a firm accumulates in the new country environment as the firm's "local experience." To indicate a firm's local experience, we use both the subsidiary-level and parent-level experience in the host country. Specifically, while a subsidiary gains local experience by operating in a new country over time, we expect its parent to gain another level of experience if it operates multiple subsidiaries in the same host country. For a subsidiary firm's local experience, we use the subsidiary's duration in the host country measured in years. For a parent firm's local experience, we use the number of other subsidiaries the parent already operates in the same country because the parent accrues valuable experience each time it transfers its knowledge management mechanisms to a subsidiary. Although we could have used the number of accumulated subsidiary-years, we are instead interested in capturing the number of experiences gained by the parent in transferring its knowledge management mechanisms in a particular host country. Therefore, we use the parent's number of other subsidiaries in the same country to capture the number of discrete events that the parent firm has experienced in a specific environment. These two local experience variables vary by firm-year.

In addition to our focal variables, we include a number of control variables for the parent firm, subsidiary firm, and host country to account for other possible explanations. We include "parent firm age" (years) and "parent firm size" (assets), using parent firm-year-varying log values; older firms and larger firms may have accumulated more general international experience that leads them

to do more local staffing. We also include “parent international experience,” the logged count of subsidiaries that the parent operates around the world, excluding the focal country, which is parent firm-year-varying. This measure is important to include because, while we focus on a parent firm’s local experience in the host country, we also want to account for experience across countries.

We include “subsidiary size” (number of employees), which is subsidiary firm-year-varying, because a larger subsidiary may have a greater need for local staffing. Also, we include “subsidiary ownership” using a dummy variable (1 if a wholly-owned subsidiary and 0 otherwise). Firms typically establish wholly-owned subsidiaries when they have distinctive resources to protect, while joint ventures are preferred for building capabilities or facilitating inter-firm learning (Delios and Beamish 1999; Luo 2002).

Beyond these controls, we include subsidiary-level fixed effects. Subsidiary fixed effects account for subsidiary traits that are time-invariant across our investigation period. For example, a subsidiary’s motive for entry is included as part of the subsidiary fixed effect (since a subsidiary’s motive is unlikely to change). Because our subsidiary firms did not change parents within the study period, subsidiary effects also capture any time-invariant parent firm effects. For example, a particular parent firm may have systematically higher or lower levels of local staffing across its subsidiaries. This parent-level effect will be captured by the subsidiary fixed effect. Subsidiary effects also capture any host country’s effects. A subsidiary’s host country is constant. Specific traits of the country in which the subsidiary operates that are time-invariant, such as labor practices, intellectual property regimes, and non-compete standards, are included in the subsidiary fixed effect. As a result, any attribute of the parent firm, host country, or subsidiary level that is time-invariant is captured by the fixed effect.

Besides parent and subsidiary firm characteristics, we also want to account for traits of the country environments in which firms operate. While we do include subsidiary-level fixed effects, which capture time-invariant country traits, we also want to account for time-varying country traits. Because our focal variables are country-year-varying, we need to include country-year-varying controls. (This avoids blatant variable omission where only our focal variables vary at the level of analysis of our dependent variable.) We measure

Table 1. Descriptive Statistics and Correlations^a

	Variable	units	mean	s.d.	1	2	3	4	5	6	7	8	9	10
1	Local manager intensity	fraction	0.60	0.31										
2	Parent firm age ^b	years	50.01	16.10	-0.16									
3	Parent firm size ^b	assets (millions)	522.20	977.28	-0.15	0.67								
4	Parent firm's international experience ^b	# of affiliates abroad	18.97	20.82	-0.19	0.63	0.90							
5	Subsidiary size ^b	employees (000's)	0.71	1.43	-0.01	0.15	0.10	0.11						
6	Subsidiary ownership (WOS vs. JV)	dummy (1=WOS)	0.63	0.48	-0.30	-0.09	-0.03	0.02	0.01					
7	Host country competitiveness	RCA index	1.40	0.41	0.10	-0.13	-0.15	-0.14	0.09	0.03				
8	Firm's internal knowledge stock	R&D intensity	0.05	0.03	-0.21	0.49	0.65	0.64	0.04	-0.04	-0.22			
9	External knowledge in the host ^b	patents (000's)	7.77	16.96	-0.09	0.00	0.09	0.08	-0.08	0.25	-0.24	0.13		
10	Subsidiary experience in host	years	10.80	7.39	0.12	0.02	-0.01	0.01	0.26	0.03	0.22	-0.11	-0.03	
11	Parent experience in host	# of affiliates in host	2.98	4.91	-0.02	0.20	0.24	0.28	0.00	0.01	-0.04	0.15	0.14	0.08

^aCorrelations greater than .07 are significant at $p < .05$, $n = 1,035$.

^bRaw values reported above; variables transformed for statistical analysis by taking log

“host country export competitiveness” using a country’s “revealed comparative advantage,” which is the country’s share of world exports in the electronics industry divided by the country’s share of total world exports (from the NBER International Trade Database). Porter used this measure to identify the competitive advantage of nations in his best-selling volume on the topic (Porter 1990: 739), in which he argued that a country with a greater share of world exports in a particular industry must be populated by firms that are, on average, more competitive.

Summary statistics for our variables appear below in Table 1.

Statistical Methods

Our dataset has two notable traits. First, it is panel data: time-series, cross-sectional. Second, there are multiple observations per subsidiary and multiple subsidiaries per parent. We address these two traits using the panel data method of two-way fixed effects (for time and subsidiary).

Fixed effects are equivalent to having dummy variables for each of the two dimensions: dummies for years and dummies for each subsidiary. Year dummies account for any particular idiosyncrasies common across all subsidiary firms in a given year. Subsidiary dummies account for subsidiary traits that are time-invariant across our investigation period. As discussed above in the “independent variable” section, the subsidiary fixed effect captures any attribute of the parent firm, host country, or subsidiary firm that is time-invariant.

RESULTS

Table 2 presents the results for our hypotheses. The two variables reflecting the opposing sides of the potential knowledge trade-off are “internal knowledge” (firm R&D intensity) and “external knowledge” (country’s annual patent count). Column (1) presents the specification with the control variables only. Columns (2) and (3) introduce the focal independent variables: “internal knowledge” and “external knowledge.” Columns (4) and (5) introduce the main effects of the subsidiary and parent local experience as control variables. We are interested not in the main effects of local experience, but the

Table 2. Local Experience, Internal and External Knowledge, and Firm Localization

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dep Var: local manager intensity									
Subsidiary firm fixed-effects [^]	included *** (0.533)	included *** (0.531)	included *** (0.531)	included *** (0.533)	included *** (0.534)	included *** (0.550)	included *** (0.548)	included *** (0.549)	included *** (0.549)
(parent firm fixed-effect [^])	included								
(country fixed-effects [^])	included								
(subsidiary motive/ purpose [^])	included								
Year fixed-effects	included *	included *	included *	included ***					
Parent firm age	-0.840 (0.533)	-0.858 (0.531)	-0.814 (0.531)	-0.934 (0.533)	-0.926 (0.534)	-0.856 (0.550)	-0.873 (0.548)	-0.847 (0.549)	-0.915 (0.549)
Parent firm size	0.249 (0.075)	0.249 (0.076)	0.246 (0.076)	0.258 (0.076)	0.258 (0.076)	0.254 (0.076)	0.254 (0.076)	0.260 (0.076)	0.272 (0.076)
Parent international experience	0.009 (0.041)	0.012 (0.041)	0.010 (0.041)	0.001 (0.041)	-0.002 (0.042)	-0.002 (0.042)	0.002 (0.042)	-0.001 (0.042)	-0.004 (0.042)
Subsidiary size	-0.010 (0.019)	-0.0090 (0.019)	-0.010 (0.019)	-0.020 (0.020)	-0.020 (0.020)	-0.019 (0.020)	-0.013 (0.020)	-0.013 (0.020)	-0.013 (0.020)
WOS vs. JV	-0.078 (0.058)	-0.093 (0.059)	-0.092 (0.058)	-0.096 (0.058)	-0.096 (0.058)	-0.101 (0.059)	-0.097 (0.059)	-0.098 (0.059)	-0.098 (0.059)
Host ctry export competitiveness	0.097 (0.063)	0.096 (0.063)	0.142 (0.067)	0.099 (0.071)	0.099 (0.071)	0.095 (0.071)	0.125 (0.072)	0.122 (0.072)	0.119 (0.072)
Internal knowledge [H1]		-1.725 (0.767)	-1.696 (0.770)	-1.670 (0.754)	-1.670 (0.754)	-1.612 (0.760)	-1.540 (0.751)	-1.510 (0.756)	-1.559 (0.756)
External knowledge [H2]			0.026 (0.013)	0.027 (0.013)	0.028 (0.013)	0.028 (0.013)	0.032 (0.013)	0.033 (0.013)	0.037 (0.013)

Table 2. (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dep Var: local manager intensity									
Subsidiary experience in host		0.081 (0.041)		0.082 (0.041)	0.082 (0.041)	0.082 (0.041)	0.101 (0.042)	0.100 (0.042)	0.107 (0.042)
Parent experience in host					-0.004 (0.013)	0.004 (0.001)	0.005 (0.013)	0.007 (0.013)	0.007 (0.013)
Internal knowledge * Sub exp. [H3]						0.064 (0.113)	0.068 (0.115)	0.057 (0.113)	0.058 (0.113)
External knowledge * Sub exp. [H3]							0.002 (0.001)	0.002 (0.001)	0.003 (0.001)
Internal knowledge *								0.070 (0.092)	0.063 (0.092)
Parent exp. [H4]									-0.001 (0.000)
External knowledge *									
Parent exp. [H4]									
Observations	1035	1035	1035	1035	1035	1035	1035	1035	1035
Number of subsidiaries	207	207	207	207	207	207	207	207	207
Adj R-squared	0.661	0.665	0.667	0.679	0.679	0.679	0.680	0.680	0.681
Joint tests of experience interactions									
Subsidiary exp. [H3]: F-statistic (dof)							2.84 (2) *		3.67 (2) **
Parent exp. [H4]: F-statistic (dof)									2.36 (2) *

standard errors in parentheses

^ subsidiary level fixed-effects by definition also includes any attributes that are time invariant, such as parent effects, country effects, subsidiary motives, etc.

† * ** ††† indicate significant at 10%, 5%, 1%, and 0.1% levels for two-tailed test, respectively

interaction effects explored in Columns (6) through (9).

Among the control variables, few have significant coefficient estimates across all specifications. Subsidiaries with larger parent firms are more local manager-intensive. Wholly-owned subsidiaries are less local manager-intensive than joint ventures. In contrast, the subsidiary fixed effects as a group are highly significant, which is not surprising given that they account for the multitude of other explanations discussed earlier. The presence of these 206 dummy variables is why the R^2 value is so high – there are 206 intercept shifters – and also why so few of the other control variables are significant.

Turning to our focal variables of “internal knowledge” and “external knowledge,” we find strong and consistent support for hypotheses 1 and 2 across all columns. The coefficient estimate for “internal knowledge” is consistently negative and significant, suggesting that higher levels of parent firm R&D are associated with lower local manager intensity. This finding is consistent with hypothesis 1: the greater the firm’s internal knowledge stocks, the less the firm will localize top management. Second, and consistent with hypothesis 2, “external knowledge” is consistently positive and significant: the greater the potential for external knowledge in the new environment, the more the firm will localize top management. Overall, the opposite

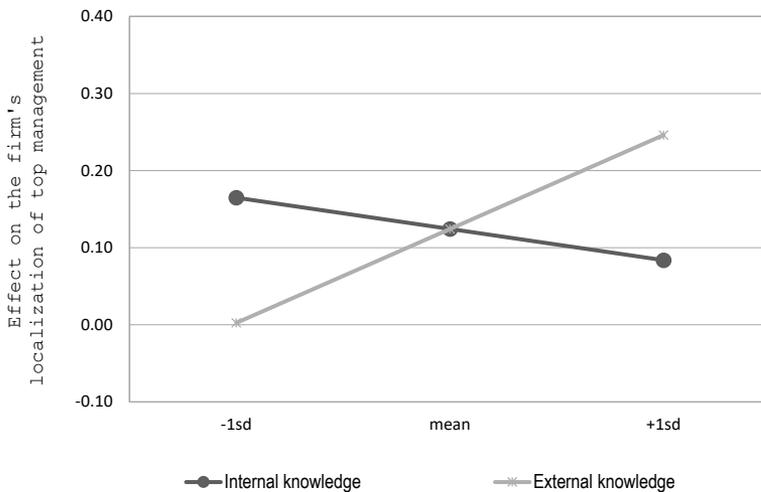


Figure 1. Trade-off between Internal/External Knowledge and Localization of Subsidiary Top Management

direction of the coefficient estimates of hypotheses 1 and 2 are consistent with our main argument that multinationals face a trade-off between internal and external sources of knowledge, and that firms manage this trade-off, in part, by adjusting the extent of top management localization.

We plot these opposing effects in Figure 1 using the coefficient estimates for “internal knowledge” and “external knowledge” from column (5) in Table 2. To determine the range for the x-axis, we use the variables’ means plus and minus one standard deviation. The y-axis is the “effect on localization (local manager intensity).” For internal knowledge, a firm with greater-than-average R&D intensity will be about 5% less local-manager intensive than a firm with average R&D, which is consistent with prioritizing internal knowledge transfer. This change of 5% is from the overall average of 60% local manager intensity reported in Table 1, which gives a sense of the magnitude of the effect. For external knowledge, a firm located in a country with greater-than-average patent stocks in the electronics sector will have about 10% greater local manager intensity than a firm in a country with an average patent stock in electronics. It is consistent with the notion of multinational firms tapping into richer technological environments for external knowledge.

We turn now to how firms’ local experience affects their use of top managers in managing this trade-off. We interact “internal knowledge” and “external knowledge” with the two levels of local experience, resulting in a pair of interaction terms for “Subsidiary experience in the host” and a pair of interaction terms for “Parent experience in the host.” Because each interaction term in a pair will be highly correlated with the other, we center the main effect variables prior to computing interaction terms (Cohen et al. 2003) and conduct F-tests on the interaction terms’ coefficient estimates in pairs. The F-tests assess whether the inclusion of these interaction term pairs improves the fit of the overall model. F-tests are important for assessing the statistical significance of the variables for two reasons. First, since collinearity increases the coefficient estimates’ standard errors, t-tests for the individual coefficient estimates will tend to accept the null hypothesis that coefficients are not different from zero. Second, because we expect that local experience will affect how firms use top managers to manage both internal and external knowledge, we want to test this joint outcome (once at the par-

ent level and once at the subsidiary level).

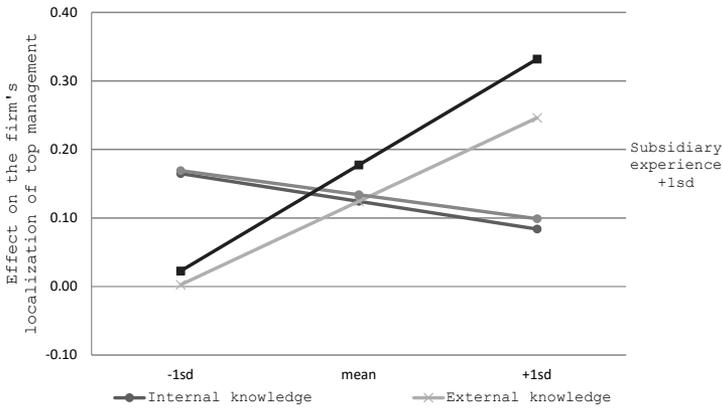
Columns (6) through (9) present the results for hypotheses 3 and 4: how local experience may alter the knowledge trade-off. Using the four columns, we introduce the interaction variables one at a time, starting with the pair of “Subsidiary experience in the host” interactions and then adding the pair of “Parent experience in host” interactions.

Looking across the columns, at the subsidiary level, “External knowledge \times Subsidiary experience” has consistently significant effects based upon individual t-tests. The estimate is positive as expected, suggesting that firms with more local experience rely more on local top managers to acquire external knowledge. At the parent level in the final column, “External knowledge \times Parent experience” is also significant. The estimate is negative as expected, suggesting that when a parent firm accumulates more experience in the focal country, it relies less on employing local managers to acquire external knowledge from the host environment. These t-tests each support half of hypotheses 3 and 4. The other half of hypotheses 3 and 4 anticipate significant positive coefficient estimates for “Internal knowledge \times Subsidiary experience” and “Internal knowledge \times Parent experience,” which are not observed in our statistical analysis.

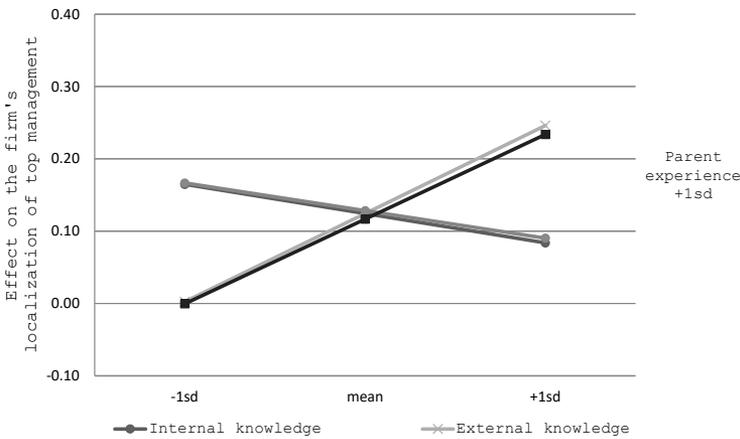
We also used F-tests to jointly test the pair of subsidiary-level local experience interaction terms and the pair of parent-level local experience interaction terms. These joint F-tests are reported at the bottom of Table 2 in Columns (7) and (9). In column (7), the F-test of hypothesis 3 (the pair of “Subsidiary experience in the host” interaction terms) is significant at a 10% level. F-test values improve in column (9) to the 5% level when the parent-level experience interaction terms are included. Also, in column (9), the F-test result of hypothesis 4 (the pair of “Parent experience in the host” interaction terms) is significant at the 10% level. Based upon these joint F-tests, and when all interaction variables of interest are included, we find partial support for hypothesis 3 and 4.

Interpreting the coefficients, we first examine the pair of subsidiary-level local experience interaction terms. We consider their effect on the baseline knowledge trade-off by overlaying the subsidiary interaction term results from column (9) on top of those previously shown in Figure 1. These are shown in Figure 2.

Figure 2 shows how the subsidiary firm’s local experience alters the baseline knowledge trade-off. The solid set of lines is the base-



Figures 2. Effect of Subsidiary Local Experience on Knowledge Tradeoff



Figures 3. Effect of Parent Local Experience on Knowledge Tradeoff

line trade-off shown in Figure 1, which represents firms with an average level of subsidiary local experience. The dotted set of lines indicates how the trade-off shifts for more experienced subsidiaries – those with an average level plus one standard deviation of local experience. Because the coefficient estimate for “Internal knowledge × Subsidiary experience” is not significantly different from zero, the dotted “internal knowledge” line is mostly unchanged from the baseline. The dotted “external knowledge” line shows that more experienced subsidiaries will have greater local manager intensity (33% vs. 25% for average experience subsidiaries) for high external knowl-

edge locations. Our results are based on time-varying data, suggesting that these differences exist not only across firms but also within firms over time.

Figure 3 shows how the parent firm's local experience alters the baseline knowledge trade-off for multinationals. Because the coefficient estimate for "Internal knowledge \times Parent experience" is not significantly different from zero, the dotted "internal knowledge" line is mostly unchanged from the baseline. In managing external knowledge, the dotted "external knowledge" line shows that subsidiaries with more experienced parents utilize slightly fewer local top managers (24% vs. 25% for average parent experience subsidiaries) in high external knowledge locations. This indicates that the parent experience effect is clearly smaller than the subsidiary experience effect.

DISCUSSION AND CONCLUSION

While both internal knowledge transfer and external knowledge sourcing have received considerable attention in the knowledge management literature, we still have limited understanding about the conditions that favor one mode over the other or specific choices firms make to manage knowledge flows (Capron and Mitchell 2009; Grigorious and Rothaermel 2017). Using a panel data of Japanese overseas subsidiaries, we examine multinational firms' strategic choices to transfer internal knowledge and augment external knowledge in their overseas subsidiaries.

In an international setting where the nature of internal and external knowledge is relatively clear, we examine multinational firms' staffing decision regarding the composition of subsidiary top management – the proportion of expatriates from the home country versus that of local managers from the host country. Sending more expatriates helps transfer internal knowledge while hiring local managers helps acquire external knowledge. Our core argument is that in managing knowledge flows, a multinational firm's strategic decision on the extent of top management localization is affected by three conditions: (1) the firm's existing stock of internal knowledge, (2) the stock of external knowledge available in the host country location, and (3) the subsidiary's and parent firm's accumulated local experience in the host country.

Our results indicate that overseas subsidiaries of Japanese

multinationals employed fewer locals in top management positions when their parent firms were more R&D-intensive, and more locals when the subsidiaries operated in countries with larger industry-specific patent stocks. By choosing more expatriate managers or local managers, firms prioritize one type of knowledge source at the expense of the other – they face a knowledge trade-off.

Firm's local experiences at both the subsidiary and parent firm levels appear to alter this knowledge trade-off. The statistical results show that more experienced subsidiaries utilized more local managers when there was more external knowledge to access, suggesting that firms with more local experience shift their focus from transferring internal knowledge to acquiring external knowledge in their host country environment. In contrast, greater parent-level experience enables their subsidiaries to access alternative knowledge sources or channels and helps them improve various knowledge management mechanisms, making the subsidiaries less reliant on top management staffing – either expatriate or local managers – in managing internal or external knowledge flows. This latitude eases the knowledge trade-off between internal versus external knowledge.

By highlighting not only conditions that affect the firm's choices to manage knowledge flows but also subtle nuances in firms' decisions derived from two distinct levels of multinational firm's local experience, we enrich the knowledge management literature of multinational firms. Our findings provide new insights into the contingent effects of local experiences in managing knowledge trade-off and give answers on how overseas subsidiaries' strategic intent can evolve over time as the multinationals become more familiar to the host country market conditions.

Our findings have several implications for the development in the international business literature. Many international business literature has focused primarily on the strategic choices of multinationals when they make their initial investments. Why firms internalize, what mode of entry they use, where they locate, and how they organize are all classic lines of inquiry with clearly received wisdom (see Caves, 1996 for a review). However, the literature has little to say about the strategic choices firms make after settling into new international environments. We hope that this study will inspire a greater body of future research to examine how multinational firms' strategic decisions evolve over time to adapt in their host environments after initial entry.

Although this study demonstrates how multinational firms employ one particular mechanism in managing the internal and external knowledge flows, additional future research is called to address how firms prioritize the specific type of knowledge management mechanism over the others. It would create opportunities for a related inquiry into how firms manage a portfolio of knowledge management mechanisms. Besides top management staffing, multinational firms can utilize other various knowledge management mechanisms – employee mobility, technical exchange among scientists/engineers, reporting systems, supplier relationships, etc. (Argote and Ingram 2000; Song, Almeida, and Wu 2003).

For example, as the impact of social media increases in the Chinese market, multinational firms create a new mobile-based marketing platform or use local digital influencers as a new type of local partner. Compared to traditional knowledge management mechanisms (e.g., expatriates, local suppliers, distribution partners), this doesn't require a significant up-front investment, and sometimes its impact is more direct and instant. For instance, Tao Liang, a Chinese influencer, also known as "Mr. Bags," produces much handbags-related content using local social media platforms. He also collaborated with Italy's Tod's and many foreign handbag brands, and he generated nearly \$500,000 in sales of a limited-edition handbag in just six minutes (Backaler 2018). To accelerate foreign expansion, multinational firms need to fasten their speed to identify new sources of knowledge management mechanism, and how to successfully build trust with various local connectors will be constantly important in multiple environments undergoing rapid change.

This study also contributes to our understanding in organizational learning and search literature. As firms accumulate experiences, firms shift their attention among the multiple goals, thus having the right balance between the conflicting pressure is critical in making a strategic decision (Han and Park 2016). Unlike previous studies treating experience variable as a broad catch-all, this study considers the underlying heterogeneity in experience, and thus we highlight the importance of multiple levels in multinational firms' learning process. As Levitt and March (1988) suggested, affiliated firms may be learning at different levels and rates. Our research findings of the parent and subsidiary local experience indicate that there may be essential differences in conceptualizing and measuring

multi-level learning – accumulated time on one level versus the number of events on another level. Separating parent experience from subsidiary experience is an important first step in unpacking the strategic value of the experience for multinational firms' global competitiveness.

This study has several limitations. Most obviously, our research findings are based on firms from a single country (Japan) and a single industry sector (Electronics). As Miao and Song (2014) suggested, the learning mechanisms and the process of knowledge creation follow different trajectories depending on the institutional contexts. Thus, multinational firms from emerging economies show distinctive search patterns compared to established firms from advanced economies, as they can enjoy a benefit from the exploitative or neighborhood search (Miao and Song 2014). As a result, our findings might not be generalized to multinational firms originating from different countries in different industry contexts.

Although technology-based knowledge stock is considered as a major source of internal and external knowledge in the research-intensive industry, there are many additional host country market-related factors, influencing subsidiary's performance and knowledge management, such as political corruptions, protection of intellectual property, and other socio-environmental concerns (Meyer, Li, and Schotter 2020). These institutional factors also affect how multinational firms manage a portfolio among the various knowledge management mechanisms and thus influence on the firm's future strategic choices in the host country. By collecting data from multiple industries and considering other contextual factors, future studies could extend the external validity of the current study.

While our statistical findings are driven by panel data, the longitudinal dimension of the panel is relatively short due to the limited availability of data on the dependent variable. We believe these shortcomings are offset by the unique opportunity the context provides to explore a specific choice that firms make to manage knowledge trade-offs. We hope that this study will stimulate future strategy and international business scholars to investigate how multinational firms manage the portfolio of knowledge management mechanisms and how it evolves over time.

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