


The role of dual embeddedness and organizational learning in subsidiary development

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Abstract We investigate how subsidiaries exploit the knowledge flows embedded in internal and external networks and support their development in terms of scope (breadth of functional operations) and competence (ability to perform specific activities). We argue that individual subsidiaries have different organizational learning processes, which would influence the way subsidiaries evolve and manage multiple sources of knowledge and adapt their knowledge structure and routines systematically for subsidiary-wide development. Our analysis of 81 foreign-owned subsidiaries in China shows that subsidiary competence is enhanced by the knowledge arising from MNC networks whereas subsidiary scope depends on the knowledge embedded in the host environments. Moreover, organizational learning affects the way knowledge adapted from internal embeddedness but not external embeddedness. These findings imply that foreign subsidiaries must effectively cope with increased flows of distant knowledge within MNC networks while maintaining their location-specific advantage. The different outcomes of subsidiary development add a nuanced understanding of the relationship between dual embeddedness and subsidiary development.

Keywords MNC network · Internal embeddedness · External embeddedness · Organizational learning · Subsidiary development

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Research on the evolution of foreign-owned subsidiaries and subsidiary development in host countries has increasingly garnered scholarly attention in international business (Ambos, Andersson, & Birkinshaw, 2010; Cavanagh & Freeman, 2012; Meyer, Mudambi, & Narula, 2011; Paterson & Brock, 2002). Recent studies based mostly on case study research argue that the role of subsidiaries evolves by accessing and assimilating knowledge via extensive relationships embedded in both internal and external networks (Achcaoucaou, Miravittles, & León-Darder, 2014; Erkelens, Hooff, Huysman, & Vlaar, 2015; Figueiredo, 2011; Yamin & Andersson, 2011). The findings in this stream of work demonstrate a positive association between an aggregate level of knowledge linkages and subsidiary performance, assuming that these linkages bring in useful knowledge pertaining to capability development, problem solving, and opportunities for strategic investments. Insofar as subsidiary evolution is concerned, however, not all subsidiaries learn and adapt to their environments equally because their relationships embedded in the networks continue to change over time (Andersson, Forsgren, & Holm, 2002; Forsgren, Holm, & Johanson, 2005). Moreover, past research has focused primarily on the competence or the importance of the subsidiary as an outcome, overlooking subsidiary development in such areas as subsidiary scope which can similarly be influenced by the network advantage and learning initiative of the subsidiary. Therefore, this study aims to fill the research gaps by verifying the effects of internal and external embeddedness on the development of competence and scope at a subsidiary level.

A subsidiary is simultaneously embedded in internal and external networks (Achcaoucaou et al., 2014; Andersson et al., 2002; Mudambi & Navarra, 2004). An internal network consists of multinational corporation (MNC) headquarters (HQ) and all its subsidiaries, whereas an external network includes customers, suppliers, and competitors in the host country. The MNC networks literature shows that relational embeddedness develops over time between HQ and subsidiaries to facilitate the transfer of knowledge from HQ; HQ in turn leverages subsidiary-specific advantage by sharing knowledge between sister subsidiaries. Moreover, individual subsidiaries evolve to assimilate external knowledge from the local environments in order to perform their designated functions more competently and efficiently relative to their local competitors. As such, the role of subsidiaries and their performance can be shaped by both types of networks, through communicating and processing information and knowledge these subsidiaries acquire from the networks. With the notable exceptions of Achcaoucaou et al. (2014), Ciabuschi, Holm, and Martín (2014), Figueiredo (2011), Jindra, Giroud, and Scott-Kennel (2009), and Najafi-Tavani, Axele, and Andersson (2014), few studies systematically verify the simultaneous impact of internal and external embeddedness on different aspects of subsidiary development. Furthermore, little attention has been paid to the learning process of the subsidiary to internalize knowledge for its own development (Eapen, 2012).

To investigate the nuanced relationship between subsidiary embeddedness and subsidiary development, we introduce and explore the role of organizational learning in subsidiary development, which would reveal the effectiveness of knowledge use in a subsidiary. We adopt Huber's (1991) organizational learning theory in our conceptual model because the theory defines organizational learning as processes which act on information or knowledge and subsequently change the range of potential firm behaviors. The conceptual model we propose offers an account for variation of subsidiary

development associated with different information processes implemented by individual subsidiaries. The information processing view of organizational learning entails a form of inter-unit communications characterized by the frequency and quality of information flows, which should have direct implications on subsidiary development.

We find support for some of our hypotheses from the regression results using surveyed data of 81 foreign-owned subsidiaries operating in China. Our findings show that internal embeddedness relates positively to subsidiary competence, whereas external embeddedness relates positively to subsidiary scope. Moreover, a subsidiary's learning process fully mediates the relationship between internal embeddedness and subsidiary competence only. These results imply that subsidiary embeddedness has differential impact on subsidiary development. Moreover, the learning initiatives of individual subsidiaries are suited for knowledge sharing more within MNCs than with local partners. Above all, the generalization of knowledge benefits arising from dual embeddedness for subsidiary development must be treated with caution.

This study contributes to our understanding of subsidiary development in two aspects. First, we make a distinction in subsidiary development by measuring the changes in scope and in competence as a result of subsidiaries acquiring embedded knowledge (Benito, Garøgaard, & Narula, 2003). Prior studies tend to focus on subsidiary competence as the sole performance measure of a subsidiary's ability to utilize resources to achieve MNC's initiatives, overlooking the development of subsidiary scope which implies the success of subsidiary adaptation in a host country environment (Andersson et al., 2002; Forsgren et al., 2005). The different outcomes of subsidiary development associated with internal and external embeddedness respectively also add a nuanced understanding of the influence of subsidiary embeddedness. Second, we integrate the concept of organizational learning as a mediating mechanism in the network model of subsidiary development. Existing research has assumed but not empirically verified the role of organizational learning in subsidiary development (Manolopoulos, Papanastassiou, & Pearce, 2005; Mudambi & Navarra, 2004; Tregaskis, 2003). Our model sheds light on how subsidiaries develop their competence and scope differently, which depend on not only the type of embeddedness but also the learning initiatives implemented by individual subsidiaries.

Our study also adds to the literature of organizational learning in cross-border contexts, which can be traced back to the seminal works of Hamel (1991) and Lyles and Salk (1996). Extant studies like Dhanaraj, Lyles, Steensma, and Tihanyi (2004) and Park (2010) basically focus on a one-dimensional process of subsidiary learning, i.e. knowledge acquisition from parent firms. Lane, Salk, and Lyles (2001) and Steensma and Lyles (2000) found mixed results for the mediating effect of knowledge acquisition between the antecedents of learning and a subsidiary's survival and performance. By adopting a richer perspective of organizational learning concept in Huber (1991), our work demonstrates that more learning efforts are necessary for communicating, exploiting and assimilating the knowledge benefits arising from internal embeddedness than from external embeddedness.

The remainder of the article proceeds as follows. The next section provides a theoretical background for the conceptual model and develops the hypotheses. The third section describes the research methodology. In the final two sections we discuss the results and implications, and conclude the study with limitations and directions for future research.

Theoretical background and hypothesis development

Subsidiary embeddedness

In international business literature subsidiary embeddedness is referred to as a set of business linkages between a focal subsidiary and other business entities, including partners from both internal and external networks of the subsidiary. Through business linkages, the subsidiary relies on knowledge and other resources to enhance the competence and the importance of the subsidiary's role (Forsgren et al., 2005; Najafi-Tavani et al., 2014; Yamin & Andersson, 2011). As separate demands from the HQ and the host environments put emphasis on different types of activities, knowledge sharing becomes an important mechanism to support the subsidiary's mandate and localization strategy (Tsai, 2002; Yamin & Andersson, 2011).

From a knowledge-based perspective, embedded networks are a primary source for diverse knowledge about internationalization and localization opportunities, which MNC HQs and subsidiaries can exploit to enhance their competitive and comparative advantage (Cantwell & Mudambi, 2011). Subsidiary embeddedness exposes a subsidiary to knowledge outside the organization (Andersson et al., 2002) and promotes sharing of knowledge between business entities in the networks (Achcaoucaou et al., 2014; Michailova & Minbaeva, 2012). Extant studies have attributed the success of subsidiary development to an extensive network of business linkages, enabling subsidiaries to exploit the hierarchical, lateral and vertical flows of knowledge (Meyer et al., 2011). According to the empirical findings, with broadened access to external knowledge, resources, and capabilities, a subsidiary can expect to gain favorable corporate support and parent mandate assignments (Luo, 2005) and more autonomy in its strategic actions (Andersson, Forsgren, & Holm, 2007), exert influence on HQ's strategic decisions (Achcaoucaou et al., 2014), and change its role and innovative capability over time (Jindra et al., 2009). The knowledge benefits of subsidiary embeddedness thus directly influence subsidiary development, improving the subsidiary's performance.

Embedded relations do change as a subsidiary continues to seek strategic resources to perform its activities. Thus, the adaptation and learning processes, which manage the flows of functional activities, knowledge and other resources, are instrumental to building a subsidiary's organizational and technological competencies (Jindra et al., 2009). The learning process of the subsidiary not only facilitates subsidiary development but also improves MNC performance when its competencies are transferred to other units (Najafi-Tavani et al., 2014).

Next we will elaborate on the scope and competence dimensions of subsidiary development which are affected by subsidiary embeddedness.

Subsidiary development

According to Benito et al. (2003), subsidiary development can be defined as the combination of scope and competence. Scope means the fields or mandates of functional (or value-added) activities undertaken by a subsidiary, indicating the breath of subsidiary operations performed in the local environments (Birkinshaw, Hood, & Jonsson, 1998). Scope increases when localization of activities is encouraged or the

number of subsidiaries is rationalized (Birkinshaw, 1996; Poynter & Rugman, 1982). Subsidiary scope may also focus on activities within narrowly defined or specialized areas of the MNCs, like a sales function or R&D (Achcaoucaou et al., 2014; Jindra et al., 2009). Competence refers to a subsidiary's ability to utilize its knowledge and resources to perform its activities more productively and innovatively than its sister subsidiaries and local competitors (Figueiredo, 2011). A subsidiary's competence level has been shown to relate positively to the importance of the subsidiary's role in the MNC (Andersson et al., 2002). If the subsidiary has a high level of competence, it is easier to gain more autonomous control. Therefore, scope (breadth of functional operations) and competence (ability to perform specific activities) are two key dimensions of subsidiary development. Extant studies have established the role of embedded networks in building the competence, the importance, and the influence of the subsidiary (Andersson et al., 2002; Forsgren et al., 2005). To the best of our knowledge, however, no empirical research has verified how subsidiary embeddedness, through sharing and adapting knowledge, shapes the development of subsidiary scope and subsidiary competence, respectively.

The role of internal embeddedness in subsidiary development

Some scholars have argued that the pre-conditions and consequences of embedded network formation by MNCs differ between internal and external relationships (Achcaoucaou et al., 2014; Garcia-Pont, Canales, & Noboa, 2009; Yamin & Andersson, 2011). Although foreign-owned subsidiaries develop business relationships concurrently with both internal and external partners, the acquisition and adaptation process in each network will not be similar. Within the MNC network, most subsidiaries communicate and exchange knowledge and other resources under a common administrative structure, and a single dominant logic and mandate from the HQ. Since these subsidiaries have already been exposed to the HQ management culture and norms, their internal relationships may share some common activities and duplicative knowledge like the production operations (Yamin & Andersson, 2011).

The norms and trust within an MNC culture typically governs internal business exchange, lowering the transaction costs and the cognitive barriers associated with resource transfer from one context to another (Tsai, 2000). Internal embeddedness tends to promote inter-dependencies among subsidiaries and enable them to leverage, distribute or acquire new knowledge and other assets more efficiently. Empirical evidence has shown that internal exchange can provide access to strategic resources controlled by certain innovation-driven subsidiaries (Ciabuschi, Dellestrand, & Martín, 2011). The innovative subsidiaries can spread their success and influence to their parent firm and other subsidiaries through internal relationships (Garcia-Pont et al., 2009).

We thus expect a positive correlation between internal embeddedness and subsidiary scope. First, subsidiaries that proactively build relationships within an MNC will improve the HQ's recognition of their distinctive capabilities (Garcia-Pont et al., 2009). Internal embeddedness enhances a subsidiary's influence within the MNC, enabling the subsidiary to take a more active role in the strategy making process (Garcia-Pont et al., 2009). Second, the subsidiary with strong relational capital also likely gains more charter from the HQ, as well as timely information to tap into new business opportunities inside the MNC. Taken together, internal embeddedness is thus a

source of subsidiary power (Ciabuschi et al., 2011). When the subsidiary has the autonomy to make certain strategic decisions, it will try to undertake more responsibilities and increase its scope (Achcaoucaou et al., 2014).

Internal embeddedness similarly can foster the development of subsidiary competence in several ways. First, the involvement of MNCs and a global learning initiative through internal relationships entrust individual subsidiaries with the task to leverage specialized resources. Park (2010) argues that MNC involvement is an important mechanism that encourages subsidiaries to convert and transfer sticky knowledge from one host environment to another. Second, internal embeddedness promotes cooperative business arrangements among the subsidiaries (Andersson et al., 2002, 2007; Rugman & Verkebe, 2001). By sharing best practices, these subsidiaries adopt new routines and enhance their competence (Andersson, Björkman, & Forsgren, 2005; Ciabuschi et al., 2011). Third, internal embeddedness is the main source for international management skills and technologically advanced knowledge, which cannot be obtained from local partners residing in a single regional cluster. Technological and organizational knowledge combined from sources spread across the MNC international regions can be more creative and helpful for building subsidiary competence than contextual knowledge from a host country environment (Yamin & Andersson, 2011).

Based on the above reasoning, we propose that internal embeddedness should have positive influence on the development of subsidiary scope and subsidiary competence respectively. We thus state the first two hypotheses as follows:

Hypothesis 1a Internal embeddedness is positively associated with subsidiary scope.

Hypothesis 1b Internal embeddedness is positively associated with subsidiary competence.

The role of external embeddedness in subsidiary development

While internal embeddedness is concerned with promoting and implementing an MNC's global initiatives, external embeddedness is focused on business development opportunities in the host environments (Meyer et al., 2011). Generally, external networks deal with diverse partners who possess local market knowledge, key resources, and access to local business and investor communities. By forming business linkages with local partners, foreign-owned subsidiaries familiarize themselves with the local institutional logic and market conditions to perform their operations. For more established subsidiaries, embedded relationships with local firms and institutions would enable them to exploit favorable host country economic development and market opportunities (Dörrenbächer & Gammelgaard, 2006; Egelhoff, Gorman, & McCormick, 1998; Zhan, Chen, Erramilli, & Nguyen, 2009). From an evolutionary perspective, changing institutional, economic, and geographic conditions define a development path that is unique to each subsidiary (Birkinshaw & Hood, 1998). Therefore, external embeddedness should influence subsidiary development in areas beyond the traditional strengths of the MNCs.

External embeddedness can contribute to subsidiary scope in the following ways. First, external embeddedness provides direct access to local market knowledge which initially

facilitates the internationalization process of the MNC. The internationalization process depends on gradual acquisition, integration, and use of knowledge about foreign markets and operations, upon which the MNC increases its commitment to foreign markets (Johanson & Vahlne, 1977, 1990). In turn, enhanced commitments lead to added responsibility, broadened charter, and a greater extent of localized activities of the subsidiary. Second, external embeddedness engenders mutual trust, common communication protocols, shared experiences and meanings between a subsidiary and its local partners (Nahapiet & Ghoshal, 1998). The subsidiary can acquire more implicit local knowledge and take more initiatives to exploit various local market opportunities, increasing its scope of value-added activities. Third, extended relationships with local partners also foster the subsidiary's legitimacy (Kostova & Zaheer, 1999), which is conducive to new business development in the host market. It is highly beneficial for foreign subsidiaries to establish long-term relationships with local partners so as to reduce the risks and costs of operating in the host environments and increase their organizational legitimacy and brand image within the local communities. Finally, foreign subsidiaries highly embedded in the host environments will capitalize on rapid growth and improvement of the infrastructure, local factor endowments and demand conditions to increase their operations (Zhan et al., 2009).

Similarly, subsidiaries embedded in the host country will gain better access to local knowledge assets and talent pool that help develop their competence (Cantwell & Mudambi, 2005). First, foreign-owned subsidiaries are vehicles for exploiting and assimilating new capabilities from their local networks (Birkinshaw & Hood, 1998; Mascarenhas, Baveja, & Jamil, 1998). As such, these subsidiaries must commit to building close external relationships—investing time and resources to cultivate and deepen relationships with local partners (Mascarenhas et al., 1998). Embedded ties offer differential access to local resources and capabilities, which explains how and why individual subsidiaries emerge with heterogeneous capabilities even in the same geographic clusters (McEvily & Zaheer, 1999).

Second, external embeddedness provides both general and specific knowledge to strengthen a subsidiary's competence (Gammelgaard, McDonald, Stephan, Tüselmann, & Dörrenbächer, 2012). More generally, locational advantage has been attributed to local institutional conditions and endowments factors as articulated in Porter's (1990) diamond framework, enabling foreign-owned subsidiaries to develop new competence (Frost, Birkinshaw, & Ensign, 2002: 1002). Establishing relations with the local entities such as suppliers, customers and competitors, and active participation in the community of practice help the subsidiaries to locate and tap into intangible knowledge assets specific to a particular business context (Frost et al., 2002; Mascarenhas et al., 1998). Local businesses also act as an important channel for sourcing indigenous resources and talents, and influential contacts, which affect not only the subsidiary's role, but also its innovative capacity and competence (Andersson et al., 2005; Mu, Gnyawali, & Hatfield, 2007). With influential contacts, the subsidiary will become an "insider" in the local networks, facilitating its access to local knowledge spillovers and strengthening its competence (Cantwell & Mudambi, 2011: 207).

In sum, subsidiaries that are actively involved in broadening their external networks will likely bring about greater autonomy (Li, Liu, & Thomas, 2013) and create more initiatives, ultimately expanding their scope of value-added activities and competencies (Birkinshaw, 1997; Birkinshaw & Hood, 1998). We state our second set of hypotheses as follows:

Hypothesis 2a External embeddedness is positively associated with subsidiary scope.

Hypothesis 2b External embeddedness is positively associated with subsidiary competence.

The mediating role of organizational learning in subsidiary development

We propose that subsidiary embeddedness has an indirect impact on subsidiary development via a learning process within a subsidiary unit. While embedded linkages provide an efficient access to knowledge outside a subsidiary, the ease of communication process inside the subsidiary also depends on the subsidiary's internal knowledge (Cohen & Levinthal, 1990). Individual subsidiaries likely have different types of learning processes to adapt and consolidate internal and external interactions for progressive performance improvement at a subsidiary level (Figueiredo, 2011). To gain a systemic improvement, a subsidiary needs to make an effort to manage the varying intensity of knowledge use and quality of internal and external linkages. From an evolutionary perspective of subsidiary development, subsidiaries adapt and develop experiential knowledge, organizational routines and combinative capabilities, which guide behavioral change over time (Kieser, Beck, & Tainio, 2001; Kogut & Zander, 1992; Levitt & March, 1988). Subsidiaries must therefore invest and develop their capacity to manage multiple sources of knowledge, refine their routines to evaluate and accumulate new knowledge (Zollo & Winter, 2002). As subsidiaries accumulate their experience in evaluating and exploiting external knowledge, an organizational knowledge structure evolves to serve as a cognitive lens for more absorption of diverse knowledge, situated learning and complex problem solving (Cohen & Levinthal, 1990). The continuous boundary-spanning activities and evolving knowledge structure thus constitute the absorptive capacity of the subsidiary (Cohen & Levinthal, 1990).

One important mechanism that influences the development of absorptive capacity is the internal communications processes that facilitate the acquisition, interpretation, transfer and accumulation of context-specific knowledge (Cohen & Levinthal, 1990).¹ Members in exchange relations need to communicate and translate externally acquired knowledge into knowledge usable in their own context (Gupta & Govindarajan, 2000; Nonaka & Takeuchi, 1995). Huber's (1991) information processing view of learning entails a form of inter-unit communications flows as required in subsidiary development to effect a change in the range of potential behaviors. This information-based learning theory is categorized into four processes. The processes are: (1) Knowledge acquisition, a process to obtain knowledge; (2) Information distribution, a process to share information from different sources, leading to new information or understanding; (3) Information interpretation, a process which enables variation in interpreting distributed information; and (4) Organizational memory is the means by which knowledge is stored for future use. The learning processes are enhanced when each subsidiary unit obtains more new knowledge, has varied interpretations and use of

¹ "The problem of designing communication structures cannot be disentangled from the distribution of expertise in the organization. The firm's absorptive capacity depends on the individuals who stand at the interface of either the firm and the external environment or at the interface between subunits within the firm" (Cohen & Levinthal, 1990: 132).

new knowledge, and achieves a uniform understanding towards its meaning and existence. Cumulatively, these four processes are instrumental to changing the behaviors and actions of individual units and the organization as a whole.

The complex flows of knowledge through subsidiary linkages will trigger the learning processes, even after specific knowledge has been adapted and integrated into a subsidiary's production and operational practices (Figueiredo, 2011; Gupta & Govindarajan, 2000). Variation of learning is expected from different subsidiaries because heterogeneous sources of embedded relations present the following: (1) diverse information which broadens the locus of exploratory search for innovative ideas, (2) more opportunities for potentially useful knowledge combinations to meet local demand conditions, and (3) unique information for the problems, solutions, technologies, or expertise under consideration. The effects of subsidiary learning thus create a range of potential subsidiary behaviors such as expanding the functional scope of activities, introducing new local products and enhancing the competence of the subsidiary.

We therefore argue that the organizational learning role of each subsidiary mediates the relationships between subsidiary embeddedness and subsidiary development (scope and competence). In other words, subsidiary development is enhanced by transforming pieces of knowledge adapted from multiple sources into a coherent knowledge base to support the continuous development of the subsidiary (Garud & Nayyar, 1994). First, deliberate and iterative organizational learning processes at the confluence of multiple knowledge flows can help articulate and externalize specialized knowledge, enabling the focal subsidiary to centralize the efforts to enhance its own development (Zollo & Winter, 2002). Second, through learning the subsidiary can create knowledge and institutionalize the internal communication practice inside the organization (Cepeda & Vera, 2007). Third, organizational learning can guide the evolution of organizational capabilities that strengthen the subsidiary's role and position within the MNC and in the local environment (Eisenhardt & Martin, 2000).

Based on the above reasoning, organizational learning will shape how the subsidiary overcomes the challenges in balancing global integration and local responsiveness (Meyer et al., 2011) and reducing the knowledge gaps between parent firm and its local context, especially in transition economies (Figueiredo, 2011; Garcia-Pont et al., 2009; Petersen, Pedersen, & Lyles, 2008; Uhlenbruck, 2004). Therefore, we develop the following hypotheses for internal and external embeddedness:

Hypothesis 3a Organizational learning mediates the relationship between internal embeddedness and subsidiary scope.

Hypothesis 3b Organizational learning mediates the relationship between external embeddedness and subsidiary scope.

Hypothesis 4a Organizational learning mediates the relationship between internal embeddedness and subsidiary competence.

Hypothesis 4b Organizational learning mediates the relationship between external embeddedness and subsidiary competence.

Figure 1 depicts the conceptual model with the hypothesized relationships.

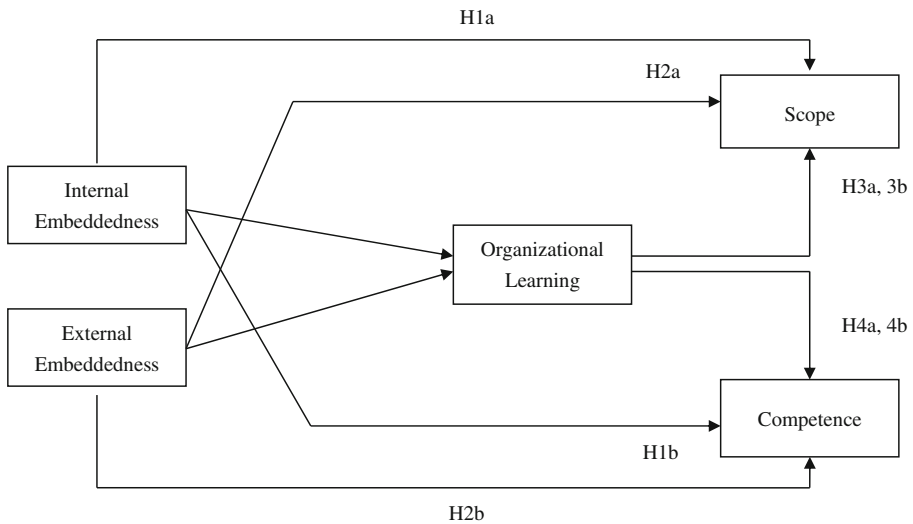


Fig. 1 The conceptual model

Data and methods

We selected foreign-owned subsidiaries operating in China as our research context. Most subsidiaries belonging to Fortune 500 companies have been exposed to rapid economic growth in China for more than a decade, resulting in a huge influence on subsidiary development. Local relationships formed by these subsidiaries are prevalent across multiple sectors. These conditions are highly appropriate for testing our hypotheses. Variation in the learning process of foreign-owned subsidiaries will be especially salient when they are located in transition economies. Given that transition economies are experiencing rapid changes in institutional and market environments (Li & Zhang, 2007), these subsidiaries are forced to enhance their learning capacities to process and exchange knowledge and information extensively. Therefore, most foreign-owned subsidiaries in China likely evolve and develop their functional roles and competencies as a result of adapting knowledge from internal and external networks.

Sample and data

We used a questionnaire survey to collect data in 2008 from MNC subsidiaries located in Shanghai, Beijing, Tianjin, Qingdao and Harbin in China. Based on the same Chinese data sources reported in Williams and Du (2014), Shanghai, Beijing and Tianjin have been ranked among the top three Chinese cities for FDI investment intensity, Qingdao belongs to mid-level FDI investment intensity, followed by Harbin in the low-level category. The targets for the survey were middle or senior managers. A total of 400 subsidiaries were reached

through one of the author's personal contacts in business and academia and 119 questionnaires were returned, generating a response rate of 29.8%. The response rate is comparable to the China survey (23%) reported in Andersson et al. (2005). About 70% of these subsidiaries were in the manufacturing sector and the rest were in services. We also identified the parent firms in order to verify their geographic origin, internationalization experience and the total number of subsidiaries as of the time of the survey. After removing observations with missing values, we tested our hypotheses using data from 81 subsidiaries. The final sample consisted of 26 MNCs from Asia, 27 from Europe and 28 from North America.

Measures

Subsidiary embeddedness

External and internal embeddedness were separately measured using a four-item scale adapted from Andersson et al. (2005). On Likert-type scales ranging from 1 = very little to 7 = very much, the respondents were asked to indicate to what extent their subsidiaries had adapted their products, technologies, operating procedures and business practices as a result of interacting with the most important local business partners or the most important MNC units. Table 1 provides the full listing of item scales in our survey.

Subsidiary development

Subsidiary development was operationalized according to the formula developed in Benito et al. (2003: 450) in two dimensions: (1) the scope of activities undertaken by a given subsidiary (SCOPE) and (2) the competence of a subsidiary in performing a specific task or activity (LEVEL). First, subsidiary scope is computed as

$$\text{SCOPE} = \sum a_i$$

where a_i = any given activity i (research, development, production of goods or services, marketing/sales, logistics/distribution, purchasing, human resource management) undertaken by a given subsidiary. The variable sums up the number of activities, ranging from 1 to 7. Next, subsidiary competence is computed as

$$\text{LEVEL} = \sum c_i / \sum a_i$$

where c_i is the level of competence of the subsidiary in performing a given activity i , as perceived by the respondent on a 7-point scale (1 = weak competence, 7 = very strong competence). Since c_i is counted only for activities a_i

Table 1 Internal consistency of survey items

Variable	Questionnaire item	Cronbach's alpha	Factor variance
Internal embeddedness (4 items)	To what extent the subsidiary's most important MNC business relationships had caused adaptations concerning its product technology?	.897	76.43%
	To what extent the subsidiary's most important MNC business relationships had caused adaptations concerning its production technology?		
	To what extent the subsidiary's most important MNC business relationships had caused adaptations concerning its standard operating procedures?		
	To what extent the subsidiary's most important MNC business relationships had caused adaptations concerning its business practice?		
External embeddedness (4 items)	To what extent the subsidiary's most important local business relationships had caused adaptations concerning its product technology?	.856	69.89%
	To what extent the subsidiary's most important local business relationships had caused adaptations concerning its production technology?		
	To what extent the subsidiary's most important local business relationships had caused adaptations concerning its standard operating procedures?		
	To what extent the subsidiary's most important local business relationships had caused adaptations concerning its business practice?		
Knowledge acquisition (4 items)	The subsidiary encourages its employees to acquire knowledge inside the MNC	.746	58.52%
	The subsidiary encourages its employees to obtain knowledge outside the MNC (Chinese market)		
	The subsidiary encourages its employees to learn by doing		
	The subsidiary encourages internal R&D activities		
Information distribution (5 items)	Information communication often happens between lateral units inside the subsidiary	.862	64.49%
	Information communication often happens between hierarchical units inside the subsidiary		
	Subsidiary culture encourages information communication between employees		
	Senior management of the subsidiary often emphasizes the importance of internal information communication		
	Subsidiary structure is conducive to information communication		
Information interpretation (3 items)	Subsidiary employees agree with the vision or strategic objectives of the firm	.761	68.08%
	Subsidiary encourages consistent understanding of new information between employees from different departments		
	All subsidiary departments have sufficient capability to understand new information		
Organizational memory (3 items)	Senior management of subsidiary often emphasizes storing new information for future use	.758	67.65%
	Information search tools and methods of subsidiary facilitate information inquiry		
	Subsidiary has a complete, computerized knowledge-base system		

actually undertaken by a given unit, LEVEL indicates the average overall competence level of that subsidiary.

Organizational learning

This construct contains a 15-item scale developed by Tang, Shi, and Bo (2012) according to Huber's (1991: 90) four learning dimensions (i.e., knowledge acquisition, information distribution, information interpretation and organizational memory). Likert-type scale ranging from 1 = totally disagree to 7 = totally agree was used for all items reported in Table 1.

Principal component factor analysis was used to assess the factor structure underlying the survey item data. Each factor has an eigenvalue greater than 1. In Table 1, the Cronbach's α of each construct is above the minimum recommended level .70 (Nunnally, 1978).

Control variables

Besides the main constructs, some other factors may be associated with subsidiary development. *Subsidiary age* is the number of years a subsidiary has been operating in China (Meyer & Estrin, 2014). *Subsidiary size* is the number of employees in logarithm form (Andersson, Buckley, & Dellestrand, 2015a). We controlled for the centralization of HQ since it has been shown to be an important determinant of knowledge transfer and subsidiary development (Andersson, Gaur, Mudambi, & Persson, 2015b). *Centralization* of HQ is measured by the perceived degree of centralized control by the respondents. We also controlled for three other MNC factors. First, *MNC international experience* is the number of years elapsed after establishing the MNC's first subsidiary outside its home country at the time of the survey. Studies have shown a positive influence of MNC international experience on subsidiary performance (Gao, Pan, Lu, & Tao, 2008). Second, *MNC network size* is the total number of subsidiaries (Anand, 2011). We obtained this data from the MNCs' websites. Finally, subsidiary development may be influenced by different MNC motives and strategies rooted in their geographic origin (Anand, 2011). Two dummy variables are used to indicate the geographic continent of MNCs from 19 countries. The dummy for *Asia* is 1 for MNCs from Asia, otherwise 0. The dummy for MNCs from European countries is 1, otherwise 0. The default is MNCs from North America.

Common method variance

Common method variance may result when dependent and independent variable data are collected from a single informant. We adopted several methods to minimize the effects of common method variance. First, we protected respondent anonymity in the survey to prevent consistency motif and social desirability (Ambos, Nell, & Pedersen, 2013; Nell & Ambos, 2013). Second, we used multiple-item constructs in our survey, since response biases are less likely to happen at the construct level (Liu, Gao, Lu, & Lioliou, 2016). Most of our

constructs came from well-established scales in the literature and the questionnaire was well pretested and validated. Third, the dependent and independent items were distributed throughout the questionnaire so that respondents could not predict the hypothesized relationships (Ambos et al., 2013). Fourth, our model integrates perceptual measures, objective measures (subsidiary size, subsidiary age, and MNC origin) and secondary data (MNC network size and international experience). This can reduce the possibility of common method bias. Fifth, our hypotheses include direct effects and mediation effects. Complex relationships between the dependent and independent variables are not part of the respondents' theory-in-use (Chang, van Witteloostuijn, & Eden, 2010). Finally, we ran the Harman's one-factor test to examine the extent of common method bias (Podsakoff & Organ, 1986). According to Andersson et al. (2015a), high common method variance likely exists when one factor emerges with an eigenvalue exceeding 1 or, alternatively, one of the factors extracted explains majority of the variance. In our test, six factors were extracted with eigenvalues above 1. Not one of the factors accounts for a majority of the variance, ranging from 3.608% to 30.3%. The six factors in Table 1 explain 71.33% of the cumulative variance.

Results

Table 2 shows the correlations matrix. Several variables are highly correlated as expected. Significant correlations are present among internal embeddedness, subsidiary competence and organizational learning, and between external embeddedness and subsidiary scope. We use OLS regression analysis to test the hypotheses. To detect potential problem of multicollinearity, we calculate the variance inflation factor (VIF) for the independent variables in each regression model as shown in Table 3. The VIF values for all the variables fall well within acceptable range, which is less than 5. This suggests that the problem of multicollinearity is not an issue of concern.

Table 3 reports the results of nine models, estimating the regressions of subsidiary scope and subsidiary competence respectively and the mediation effects of organizational learning. Models 1 and 2 are baseline models with only control variables. None of the estimated coefficients of the control variables are statistically significant. Models 3 and 4 add internal and external embeddedness as independent variables. We use these models to test our first and second hypotheses. H1a predicts that internal embeddedness is positively related to subsidiary scope. In Model 3, the coefficient estimate of internal embeddedness is not statistically significant. We thus reject H1a. H1b predicts that internal embeddedness is positively related to subsidiary competence. In Model 4, the significant coefficient estimate for internal embeddedness ($\beta = .363, p < .01$) provides support for H1b. H2a states that external embeddedness is positive correlated with subsidiary scope. In Model 3, the coefficient estimate of external embeddedness is statistically significant ($\beta = .359, p < .01$), supporting H2a. H2b states that external embeddedness is positive correlated with subsidiary competence. In Model 4, the coefficient

Table 2 The correlation matrix

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1 Scope	5.42	1.507	1											
2 Competence	5.025	1.096	-.189	1										
3 Subsidiary age	11.58	11.299	.154	.020	1									
4 Subsidiary size	6.279	1.596	.156	.067	.088	1								
5 Centralization	4.60	1.722	-.089	.189	.065	-.002	1							
6 MNC network size	173.80	216.285	.142	-.052	-.019	.120	-.046	1						
7 International experience	51.95	35.319	.007	-.015	.132	-.075	.193	.315**	1					
8 Asia	.32	.470	-.034	-.095	-.064	.137	-.011	-.054	-.325**	1				
9 Europe	.33	.474	.204	-.018	.127	-.099	-.189	.031	.011	-.486**	1			
10 Internal embeddedness	4.911	1.420	.123	.376**	.008	.013	.223*	-.035	.125	.020	-.121	1		
11 External embeddedness	4.519	1.467	.324**	.078	.132	.075	-.119	-.145	.093	-.223*	.061	0	1	
12 Organizational learning	5.135	1.024	.185	.616**	.053	.029	.209	.058	.062	-.088	.046	.497**	.136	1

* $p < .05$, ** $p < .01$ (Two tailed)

Table 3 The regression results of subsidiary embeddedness and learning on subsidiary development

Dependent variable	Model 1 Scope	Model 2 Comp Level	Model 3 Scope	Model 4 Comp Level	Model 5 Org Learning	Model 6 Scope	Model 7 Scope	Model 8 Comp Level	Model 9 Comp Level
Subsidiary age	.124 (.015)	.008 (.011)	.087 (.014)	.004 (.011)	.017 (.009)	.119 (.015)	.085 (.014)	-.010 (.009)	-.005 (.009)
Subsidiary size	.142 (.108)	.080 (.080)	.094 (.101)	.064 (.076)	.000 (.064)	.137 (.107)	.094 (.102)	.062 (.064)	.064 (.066)
Centralization	-.047 (.102)	.193 (.076)	-.015 (.098)	.139 (.074)	.163 (.062)	-.088 (.103)	-.024 (.100)	.057 (.062)	.046 (.064)
MNC network size	.125 (.001)	-.032 (.001)	.212* (.001)	.006 (.001)	.135 (.001)	.113 (.001)	.204* (.001)	-.074 (.000)	-.071 (.001)
International experience	-.011 (.006)	-.087 (.004)	-.069 (.005)	-.138 (.004)	-.103 (.003)	-.006 (.005)	-.063 (.005)	-.071 (.003)	-.080 (.003)
Asia	.065 (.440)	-.157 (.328)	.155 (.420)	-.145 (.317)	-.032 (.266)	.077 (.436)	.156 (.423)	-.117 (.263)	-.127 (.272)
Europe	.222 (.423)	-.049 (.315)	.268** (.396)	-.016 (.299)	.105 (.251)	.212 (.418)	.261** (.400)	-.081 (.253)	-.076 (.258)
Internal embeddedness			.170 (.161)	.363*** (.121)	.491*** (.102)		.141 (.186)		.084 (.120)
External embeddedness			.359*** (.167)	.071 (.126)	.168 (.106)		.349*** (.171)		-.024 (.110)
Organizational learning						.184 (.170)	.059 (.188)	.605*** (.103)	.568*** (.121)
Max VIF	1.536	1.536	1.614	1.614	1.614	1.540	1.615	1.540	1.615
R ²	.106	.061	.245	.188	.311	.138	.248	.405	.410
Adjusted R ²	.021	-.029	.150	.085	.224	.042	.140	.338	.326
ΔR ²	.106	.061	.245**	.188*	.311***	.138	.248**	.405***	.410***
F-value	1.239	.674	2.565**	1.829*	3.559***	1.441	2.306**	6.115***	4.870***
N, df	81, 7	81, 7	81, 9	81, 9	81, 9	81, 8	81, 10	81, 8	81, 10

Robust standard errors in parentheses

* $p < .10$; ** $p < .05$; *** $p < .01$

estimate of external embeddedness is not statistically significant, therefore H2b is not supported.

Models 3–9 test the mediation of organizational learning. We follow the method proposed by Baron and Kenny (1986) to validate the mediating effects of organizational learning, which include four direct and four indirect paths from subsidiary embeddedness to subsidiary development as shown in Fig. 1. The mediation model decomposes the total effects of internal and external embeddedness on subsidiary scope and subsidiary competence into two parts: (1) the direct effects of embeddedness on scope and competence, and (2) the indirect effects of embeddedness on scope and competence, which are further separated by the effects of internal and external embeddedness on learning and the effects of learning on scope and competence. When any regression result in the decomposed parts does not hold, the mediation is considered absent. Based on the regression results from Models 3–5, we find no mediation effects: (1) between internal embeddedness and subsidiary scope (H3a), and (2) between external embeddedness and subsidiary scope/competence (H3b, H4b). However, we find support for H4a. First, Models 4 and 5 show the direct effects of internal embeddedness on competence ($\beta = .363$, $p < .01$) and learning ($\beta = .491$, $p < .01$) respectively. Next, the effect of learning on competence is also present in Model 8 ($\beta = .605$, $p < .01$). Last, Model 9 demonstrates that the effect of internal embeddedness on competence becomes insignificant in the presence of learning ($\beta = .568$, $p < .01$). We thus conclude that organizational learning fully mediates the relationship between internal embeddedness and subsidiary competence only.

Concerning the control variables, the full model of subsidiary scope in Model 7 of Table 3 indicates that the coefficients of MNC network size ($\beta = .204$, $p < .10$) and the dummy variable Europe ($\beta = .261$, $p < .05$) are positive and statistically significant. This implies that MNC network size has influence on subsidiary scope and MNCs of European origin have more influence on subsidiary scope than MNCs from other continents.

We summarize the hypotheses and results as shown in Table 4:

Table 4 The hypotheses and results

	Hypotheses	Results
H1a	Internal embeddedness is positively associated with subsidiary scope	Not Supported
H1b	Internal embeddedness is positively associated with subsidiary competence	Supported
H2a	External embeddedness is positively associated with subsidiary scope	Supported
H2b	External embeddedness is positively associated with subsidiary competence	Not Supported
H3a	Organizational learning mediates the relationship between internal embeddedness and subsidiary scope	Not Supported
H3b	Organizational learning mediates the relationship between external embeddedness and subsidiary scope	Not Supported
H4a	Organizational learning mediates the relationship between internal embeddedness and subsidiary competence.	Supported
H4b	Organizational learning mediates the relationship between external embeddedness and subsidiary competence	Not Supported

Discussions and conclusion

In recent years, increasing globalization and innovative capacity of indigenous firms in emerging economies has created opportunities and challenges for MNCs to combine firm-specific resources with country-specific advantage (Meyer & Estrin, 2014). Understanding how subsidiaries evolve and develop their competence and scope enables MNCs to exploit effectively the comparative advantages of local contexts while adding more regionally specialized operations along the global supply chains. Previous research has found that knowledge flows through embedded networks drive MNC and subsidiary performance, but the issue of knowledge use and adoption in subsidiaries has been left relatively unexplored. Current literature offers limited insights as to whether the knowledge transferred is being progressively processed and applied at the receiving subsidiary (Andersson et al., 2015a). Furthermore, most studies of subsidiary embeddedness have focused on either internal networks or external networks. Few empirical studies discuss the simultaneous impact of internal and external embeddedness (Meyer et al., 2011; Ciabuschi et al., 2014). Therefore, it is unclear whether and how internal and external embeddedness have differential impact on the development of the subsidiary.

In this study, we develop a conceptual model to illustrate the direct effects of internal and external embeddedness on subsidiary development in terms of competence and scope, and their indirect effects via the process of organizational learning in receiving subsidiaries. From a learning process view, individual subsidiaries not only obtain knowledge benefits directly from their internal and external linkages but also adapt their learning processes to assess, interpret, distribute and retain the knowledge for their own development and future use. Our findings provide support for the positive relationships between external embeddedness and subsidiary scope, and between internal embeddedness and subsidiary competence. And, organizational learning fully mediates the effect of internal embeddedness on subsidiary competence.

For the development of subsidiary scope, the influence of external embeddedness is relatively more important than that of internal embeddedness, especially in the Chinese market. Owing to increasing economic reform in China and China's admission to the World Trade Organization (WTO) in 2001, more foreign MNCs established their subsidiaries in China. These subsidiaries were faced with competitive pressure to acquire the local market knowledge through partnerships, develop organizational legitimacy, and capitalize on the rapid growth of the Chinese economy. The greater than normal intensity of subsidiary adaptation in the local environments has resulted in the expansion of the localized activities. In contrast, the competence of foreign subsidiaries is influenced more by MNC's internal embeddedness. First, the flows of knowledge and resources from MNCs originated in developed countries are generally more valuable for developing the competence of the subsidiaries located in emerging economies (Zhan et al., 2009). Second, internal embeddedness provides the subsidiaries with international management skills and technological advanced knowledge, which cannot be obtained from local partners residing in developing countries. An interesting parallel development of MNC's increasing internationalization process in emerging economies is the need for new MNC competences to foster the sharing and combination of knowledge assets and best practices in institutionally diverse and less-developed contexts.

Given the above scenario of how embeddedness directly influences subsidiary development in emerging economies, it is not surprising to find an insignificant association between internal embeddedness and subsidiary scope. First, foreign-owned subsidiaries in a host country need to establish an in-depth knowledge about the host country's culture and norms, market conditions, and customer preferences in order to develop a strong resource base to support the value-added activities locally. Local knowledge situated in other host country environments of the MNC is less applicable and transferable to these subsidiaries (Erkelens et al., 2015). Second, although internal embeddedness can provide individual subsidiaries with the procedural knowledge of refining their production and operation activities, such global knowledge is less useful in expanding the range of customized products and value-added services desired by the local markets (Yamin & Andersson, 2011). Differences in geography, natural resources, national infrastructure, economic conditions and demographic attributes lead to different input and demand factors, creating new opportunities situated in the local environments of these subsidiaries. Thus, the role of internal embeddedness of foreign MNCs in developing the subsidiary scope of activities, specifically in the Chinese market, is insignificant.

We also find no significant relationship between external embeddedness and subsidiary competence. One likely explanation is that almost 70% of our sample of foreign-owned subsidiaries in China consisted of manufacturing facilities. Insofar as competence development, these facilities rely on MNCs' advanced production knowledge more than the knowledge sources from the local emerging economy (Zhan et al., 2009). Furthermore, external embeddedness cannot provide strategic resources which internal embeddedness can offer to strengthen the competence of the subsidiary to compete more effectively than its local counterparts (Ciabuschi et al., 2011).

From the above, our findings suggest that the evolution of subsidiary development varies according to the nature of knowledge flows cultivated within the global and the local networks. It remains a daunting task for a subsidiary to manage concurrently the internal pressure to perform its activities competently and the external pressure to meet the local demand efficiently. The link between subsidiary embeddedness and subsidiary development is therefore more complex and dynamic than previously suggested in the literature (Birkinshaw et al., 1998). This complexity is also reflected in our next results below.

The results on the role of organizational learning demonstrate that only the influence of internal embeddedness on subsidiary competence is fully mediated by learning. In other words, in developing a subsidiary's competence, how effective the subsidiary transfers and utilizes the strategic resources obtained from HQ is solely dependent on its learning process. Existing studies have primarily discussed or found evidence to support the main effect of internal embeddedness on subsidiary competence (Yamin & Andersson, 2011). From a social embeddedness' viewpoint, internal embeddedness increases openness in communication and knowledge overlap among the subsidiaries, and between the HQ and its subsidiaries, promoting knowledge sharing in cross-border contexts. Nonetheless, successful knowledge use can be shaped by such nuanced factors as the willingness of the subsidiary, the congruence of goals between subsidiaries, as well as the competitive versus collaborative configuration of an MNC network (Andersson et al., 2015b). Some learning initiatives at a subsidiary

level may be necessary to overcome the cognitive barriers to implementing and retaining good ideas from across the MNC network. The mediating role of organizational learning in our study is consistent with the notions of absorptive capacity and dynamic capabilities in that organizations can better exploit external knowledge as they continuously build and adapt its experiential knowledge and routines (Yamin & Andersson, 2011). Taken together, organizational learning not only reinforces the competence of individual subsidiaries but also supports an MNC's global strategy of exploring and integrating inter-regional opportunities and advantages (Meyer et al., 2011).

Interestingly, the process of subsidiary learning does not have the same impact on subsidiary scope. The first and foremost reason is that subsidiary scope is determined more directly by the local factor endowments, market conditions, institutional policies and the social cultural environment (Dunning, 1981). In terms of scope development, embedded linkages with local partners are more responsive to rapidly changing demand conditions. Still, we believe other possible related explanations could shed light on the non-significant role of subsidiary learning in mediating the effects of external embeddedness more generally. First, the four processes of Huber's (1991) organizational learning theory may not fully capture how a subsidiary communicates and adapts to external exchange in a local host environment. Yamin and Andersson (2011) argued that the respective adaptation process of internal and external embeddedness is driven by different motives. While adaptation occurs internally under the directives of the HQ with a dominant logic that governs inter-unit communications, adaptation in external relationships is initially guided by the economic interests of the subsidiary to generate revenues, followed by the need to foster trusting relationships with the local partners. We thus believe a better conceptualization of organizational learning in international business research is warranted.

Second, the expected outcomes of subsidiary learning may differ, depending on the situated knowledge accessed by a subsidiary. For instance, learning associated with external embeddedness perhaps generates more experiential knowledge and possibly knowledge specific to a regional cluster, as opposed to functional knowledge, which may influence the behavior of the subsidiary but have no direct impact on financial and functional performance. Studies have shown how external embeddedness shapes a firm's entrepreneurial orientation or innovative capacity (Figueiredo, 2011; Stam & Elfring, 2008). This points to Huber's (1991) argument that learning can change the range of a firm's potential behaviors and actions but has no immediate consequence on the firm's performance.

A major contribution of this study is the focus on the relationship between dual embeddedness and subsidiary development. The distinction we make between two aspects of subsidiary development, namely, subsidiary scope and subsidiary competence adds new understanding to how subsidiary embeddedness gives rise to differential advantages which would not be captured by an aggregate level of knowledge flows as well as a uni-dimensional measure of performance. This research complements the work by Yamin and Andersson (2011), who found internal and external embeddedness exerting negative and positive effects on the importance of MNC product development. Another important emphasis we make in this research is the learning processes which are intended to appropriate the knowledge benefits of dual embeddedness for subsidiary development. Current

research in organizational learning provides an incomplete account of subsidiary learning involving multiple embeddedness (Hotho, Lyles, & Easterby-Smith, 2015). Cantwell and Mudambi (2011) suggested that subsidiaries may evolve into competence creating units, focusing on exploratory search between internal and external networks. Beyond an information processing view, a more refined understanding of organizational learning may reveal how a subsidiary bridges the knowledge gap while addressing the tension between satisfying MNC goals and meeting external demands.

Overall, our research findings offer new managerial insight into the trade-offs in managing knowledge access and knowledge use in subsidiaries and in MNCs (Cantwell & Mudambi, 2011; Gupta & Govindarajan, 2000; Mudambi & Navarra, 2004). First, owing to the complexity of multiple embeddedness, subsidiaries and parent firms need to balance the act of seeking for investment opportunities and learning through knowledge-intensive linkages in internal and external networks. Second, variations of learning processes and incongruent goals between subsidiaries and parent firms may not lead to performance outcomes directly measurable at a subsidiary level. In both situations, top management from subsidiaries and MNCs are faced with the challenges of managing people, knowledge, and learning processes in cross-border settings (Meyer et al., 2011). For example, a subsidiary may introduce activities to combine knowledge from a broad range of functional areas specific to a local context, bringing together subsidiary and local expertise or complementary resources to create innovation (Cantwell & Mudambi, 2011). To meet a growing demand for localization, the subsidiary management may undertake further initiatives to achieve strategic investments independent of its parent firm's mandate. The knowledge and expertise embedded in such local practices are strategic assets invaluable to the parent firm, which will enhance knowledge building at a global level. In acquiring geographically dispersed knowledge, the parent firm may assign employees with specific skills as the knowledge-pollination agents to reside in individual subsidiaries and be actively involved in network learning (Erkelens et al., 2015). While it is beneficial to formalize a learning process globally and to encourage the employees to learn and share knowledge between subsidiaries, the same process does not help when exploiting locational advantage in the host environment. As such, balancing the strategic role of the subsidiary with the MNC's motivation to integrate across heterogeneous contexts presents a big challenge in organizational learning. We propose that individual subsidiaries maintain a flexible and dynamic learning process which enables them to shift their attention to new opportunities as when as these arise. Still, further research into the multi-dimensional aspects of organizational learning processes that facilitate access and use of knowledge in global and local networks will deepen our understanding of collaborative learning involving multiple embeddedness (Erkelens et al., 2015).

The study is subject to several limitations. First, we do not use probability sampling because of the difficulty of surveying foreign subsidiaries in China. We improve the variance in our data by surveying subsidiaries located in various Chinese cities with different degrees of foreign investment intensity. Second, we use cross-sectional data, which prevents the study from drawing any causal inferences. Finally, we use self-reported assessment in the survey. Although many researchers believe that subjective

assessment is not significantly different from objective data, some bias may still exist in the self-reported measures. Thus, the generalization of the findings reported here must be made with caution.

In terms of future research, to understand how subsidiaries creatively manage a bridging role of learning processes which involve multiple embeddedness, researchers may conduct longitudinal research on large MNCs with global supply chain activities performed in cross-border contexts. This proposed study will allow us to investigate into the dynamic process of subsidiary learning and the cross-level effects of global strategy and subsidiary strategy on multiple performance outcomes. Another interesting research topic for consideration is to explore new organizational learning models along with nuanced factors which affect the relationship between subsidiary embeddedness and subsidiary development (Erkelens et al., 2015; Oehmichen & Puck, 2016).

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References

- Achcaoucaou, F., Miravittles, P., & León-Darder, F. 2014. Knowledge sharing and subsidiary R&D mandate development: A matter of dual embeddedness. *International Business Review*, 23(1): 76–90.
- Ambos, T. C., Andersson, U., & Birkinshaw, J. 2010. What are the consequences of initiative-taking in multinational subsidiaries?. *Journal of International Business Studies*, 41(7): 1099–1118.
- Ambos, T. C., Nell, P. C., & Pedersen, T. 2013. Combining stocks and flows of knowledge: The effects of intra-functional and cross-functional complementarity. *Global Strategy Journal*, 3: 283–299.
- Anand, J. 2011. Permeability to inter- and intrafirm knowledge flows: The role of coordination and hierarchy in MNEs. *Global Strategy Journal*, 1: 283–300.
- Andersson, U., Björkman, I., & Forsgren, M. 2005. Managing subsidiary knowledge creation: The effect of control mechanisms on subsidiary local embeddedness. *International Business Review*, 14(5): 521–538.
- Andersson, U., Buckley, P. J., & Dellestrand, H. 2015a. In the right place at the right time!: The influence of knowledge governance tools on knowledge transfer and unitization in MNEs. *Global Strategy Journal*, 5: 27–47.
- Andersson, U., Forsgren, M., & Holm, U. 2002. The strategic impact of external networks: Subsidiary performance and competence development in the multinational corporation. *Strategic Management Journal*, 23: 979–996.
- Andersson, U., Forsgren, M., & Holm, U. 2007. Balancing subsidiary influence in the federative MNC: A business network perspective. *Journal of International Business studies*, 38: 802–818.
- Andersson, U., Gaur, A., Mudambi, R., & Persson, M. 2015b. Unpacking interunit knowledge transfer in multinational enterprises. *Global Strategy Journal*, 5: 241–255.
- Baron, R. M., & Kenny, D. A. 1986. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, 51(6): 1173–1182.
- Benito, G. R. G., Garøgaard, B., & Narula, R. 2003. Environmental influences on MNE subsidiary roles: Economic integration and the Nordic countries. *Journal of International Business Studies*, 34(5): 443–456.
- Birkinshaw, J. 1996. How multinational subsidiary mandates are gained and lost. *Journal of International Business Studies*, 27(3): 467–495.
- Birkinshaw, J. 1997. Entrepreneurship in multinational corporations: The characteristics of subsidiary initiatives. *Strategic Management Journal*, 18(3): 207–229.
- Birkinshaw, J. M., & Hood, N. 1998. Multinational subsidiary evolution: Capability and charter change in foreign-owned subsidiary companies. *Academy of Management Review*, 23(4): 773–795.
- Birkinshaw, J., Hood, N., & Jonsson, S. 1998. Building firm-specific advantages in multinational corporations: The role of subsidiary initiative. *Strategic Management Journal*, 19(3): 221–241.

- Cantwell, J., & Mudambi, R. 2005. MNE competence-creating subsidiary mandates. *Strategic Management Journal*, 26(12): 1109–1128.
- Cantwell, J. A., & Mudambi, R. 2011. Physical attraction and the geography of knowledge sourcing in multinational enterprises. *Global Strategy Journal*, 1(3–4): 206–232.
- Cavanagh, A., & Freeman, S. 2012. The development of subsidiary roles in the motor vehicle manufacturing industry. *International Business Review*, 21: 02–617.
- Cepeda, G., & Vera, D. 2007. Dynamic capabilities and operational capabilities: A knowledge management perspective. *Journal of Business Research*, 60: 426–437.
- Chang, S. J., van Witteloostuijn, A., & Eden, L. 2010. From the editors: Common method variance in international business research. *Journal of International Business Studies*, 41: 178–184.
- Ciabuschi, F., Dellestrand, H., & Martín, O. M. 2011. Internal embeddedness, headquarters involvement, and innovation importance in multinational enterprises. *Journal of Management Studies*, 48(7): 1612–1639.
- Ciabuschi, F., Holm, U., & Martín, O. M. 2014. Dual embeddedness, influence and performance of innovating subsidiaries in the multinational corporation. *International Business Review*, 23: 897–909.
- Cohen, W. M., & Levinthal, D. A. 1990. Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35: 128–152.
- Dhanaraj, C., Lyles, M. A., Steensma, H. K., & Tihanyi, L. 2004. Managing tacit and explicit knowledge transfer in IJVs: The role of relational embeddedness and the impact on performance. *Journal of International Business Studies*, 35(5): 428–442.
- Dörrenbächer, C., & Gammelgaard, J. 2006. Subsidiary role development: The effect of micro-political headquarters-subsidiary negotiations on the product, market and value-added scope of foreign-owned subsidiary. *Journal of International Management*, 12: 266–283.
- Dunning, J. H. 1981. *International production and the multinational enterprise*. London: Allen and Unwin.
- Eapen, A. 2012. Social structure and technology spillovers from foreign to domestic firms. *Journal of International Business Studies*, 43: 244–263.
- Egelhoff, W. G., Gorman, L., & McCormick, S. 1998. Using technology as a path to subsidiary development. In J. Birkinshaw, & N. Hood (Eds.). *Multinational corporate evolution and subsidiary development*: 213–238. Houndsmill: Macmillan Press.
- Eisenhardt, K. M., & Martin, J. A. 2000. Dynamic capabilities: What are they?. *Strategic Management Journal*, 21(10–11): 1105–1121.
- Erkelens, R., Hooff, B. V. D., Huysman, M., & Vlaar, P. 2015. Learning from locally embedded knowledge: Facilitating organizational learning in geographically dispersed settings. *Global Strategy Journal*, 5: 177–197.
- Figueiredo, P. N. 2011. The role of dual embeddedness in the innovative performance of MNE subsidiaries: Evidence from Brazil. *Journal of Management Studies*, 48(2): 417–440.
- Forsgren, M., Holm, U., & Johanson, J. 2005. *Managing the embedded multinational: A business network view*. Cheltenham: Edward Elgar.
- Frost, T. S., Birkinshaw, J. M., & Ensign, P. C. 2002. Centers of excellence in multinational corporations. *Strategic Management Journal*, 23(11): 997–1018.
- Gammelgaard, J., McDonald, F., Stephan, A., Tüselmann, H., & Dörrenbächer, C. 2012. The impact of increases in subsidiary autonomy and network relationships on performance. *International Business Review*, 21(6): 1158–1172.
- Gao, G., Pan, Y., Lu, J., & Tao, Z. 2008. Performance of multinational firms' subsidiaries: Influences of cumulative experience. *Management International Review*, 48(6): 749–768.
- Garcia-Pont, C., Canales, J. I., & Noboa, F. 2009. Subsidiary strategy: The embeddedness component. *Journal of Management Studies*, 46(2): 182–214.
- Garud, R., & Nayyar, P. R. 1994. Transformative capacity: Continual structuring by intertemporal technology transfer. *Strategic Management Journal*, 15(5): 365–385.
- Gupta, A. K., & Govindarajan, V. 2000. Knowledge flows within multinational corporations. *Strategic Management Journal*, 21(4): 473–496.
- Hamel, G. 1991. Competition for competence and interpartner learning within international strategic alliances. *Strategic Management Journal*, 12(S1): 83–103.
- Hotho, J. J., Lyles, M. A., & Easterby-Smith, M. 2015. The mutual impact of global strategy and organizational learning: Current themes and future directions. *Global Strategy Journal*, 5(2): 85–112.
- Huber, G. P. 1991. Organizational learning: The contributing processes and the literatures. *Organization Science*, 2(1): 88–115.
- Jindra, B., Giroud, A., & Scott-Kennel, J. 2009. Subsidiary roles, vertical linkages and economic development: Lessons from transition economies. *Journal of World Business*, 44: 167–179.

- Johanson, J., & Vahlne, J. E. 1977. The internationalization process of the firm—A model of knowledge development and increasing foreign market commitment. *Journal of International Business Studies*, 8(1): 23–32.
- Johanson, J., & Vahlne, J. E. 1990. The mechanism of internationalization. *International Marketing Review*, 7(4): 111–124.
- Kieser, A., Beck, N., & Tainio, R. 2001. Rules and organizational learning: The behavioral theory approach. In M. Dierkes, A. Berthoin Antal, J. Child, & I. Nonaka (Eds.). *Handbook of organizational learning and knowledge*: 598–623. New York: Oxford University Press.
- Kogut, B., & Zander, U. 1992. Knowledge of the firm, combinative capacities and the replication of technology. *Organization Science*, 3: 383–397.
- Kostova, T., & Zaheer, S. 1999. Organizational legitimacy under conditions of complexity: The case of the multinational enterprise. *Academy of Management Review*, 24: 64–81.
- Lane, P. J., Salk, J. E., & Lyles, M. A. 2001. Absorptive capacity, learning, and performance in international joint ventures. *Strategic Management Journal*, 22(12): 1139–1161.
- Levitt, B., & March, J. M. 1988. Organizational learning. *Annual Review of Sociology*, 14: 319–338.
- Li, H. Y., & Zhang, Y. 2007. The role of managers' political networking and functional experience in new venture performance: Evidence from China's transition economy. *Strategic Management Journal*, 28(8): 791–804.
- Li, X. Y., Liu, X. M., & Thomas, H. 2013. Market orientation, embeddedness and the autonomy and performance of multinational subsidiaries in an emerging economy. *Management International Review*, 53(6): 869–897.
- Liu, X., Gao, L., Lu, J., & Lioliou, E. 2016. Does learning at home and from abroad boost the foreign subsidiary performance of emerging economy multinational enterprises?. *International Business Review*, 25(1): 141–151.
- Luo, Y. 2005. Toward cooption within a multinational enterprise: A perspective from foreign subsidiaries. *Journal of World Business*, 40(1): 71–90.
- Lyles, M. A., & Salk, J. E. 1996. Knowledge acquisition from foreign parents in international joint ventures. *Journal of International Business Studies*, 27(5): 877–904.
- Manolopoulos, D., Papanastassiou, M., & Pearce, R. 2005. Technology sourcing in multinational enterprises and the roles of subsidiaries: An empirical investigation. *International Business Review*, 14(3): 249–267.
- Mascarenhas, B., Baveja, A., & Jamil, M. 1998. Dynamics of core competencies in leading multinational companies. *California Management Review*, 40(4): 117–132.
- McEvily, B., & Zaheer, A. 1999. Bridging ties: A source of firm heterogeneity in competitive capabilities. *Strategic Management Journal*, 12(20): 1133–1156.
- Meyer, K. E., & Estrin, S. 2014. Local context and global strategy: Extending the integration responsiveness framework to subsidiary strategy. *Global Strategy Journal*, 4(1): 1–19.
- Meyer, K. E., Mudambi, R., & Narula, R. 2011. Multinational enterprises and local contexts: The opportunities and challenges of multiple embeddedness. *Journal of Management Studies*, 48(2): 235–252.
- Michailova, S., & Minbaeva, D. 2012. Organizational values and knowledge sharing behavior in MNCs. *International Business Review*, 21: 59–70.
- Mu, S. H., Gnyawali, D. R., & Hatfield, D. E. 2007. Foreign subsidiaries' learning from local environments: An empirical test. *Management International Review*, 47(1): 79–102.
- Mudambi, R., & Navarra, P. 2004. Is knowledge power? Knowledge flows, subsidiary power and rent-seeking within MNCs. *Journal of International Business Studies*, 35(5): 385–406.
- Nahapiet, J., & Ghoshal, S. 1998. Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23: 242–266.
- Najafi-Tavani, Z., Axele, G., & Andersson, U. 2014. The interplay of networking activities and internal knowledge actions for subsidiary influence within MNCs. *Journal of World Business*, 49(1): 122–131.
- Nell, P. C., & Ambos, B. 2013. Parenting advantage in the MNC: An embeddedness perspective on the value added by headquarters. *Strategic Management Journal*, 34: 1086–1103.
- Nonaka, I., & Takeuchi, H. 1995. *The knowledge creating company: How Japanese companies create the dynamics of innovation*. New York: Oxford University Press.
- Nunnally, J. C. 1978. *Psychometric theory*. New York: McGraw Hill.
- Oehmichen, J., & Puck, J. 2016. Embeddedness, ownership mode and dynamics, and the performance of MNE subsidiaries. *Journal of International Management*, 22(1): 17–28.
- Park, B. I. 2010. What matters to managerial knowledge acquisition in international joint ventures? High knowledge acquirers versus low knowledge acquirers. *Asia Pacific Journal of Management*, 27(1): 55–79.

- Paterson, S. L., & Brock, D. M. 2002. The development of subsidiary-management research: Review and theoretical analysis. *International Business Review*, 11: 139–163.
- Petersen, B., Pedersen, T., & Lyles, M. A. 2008. Closing knowledge gaps in foreign markets. *Journal of International Business Studies*, 39(7): 1097–1113.
- Podsakoff, P. M., & Organ, D. 1986. Self-reports in organizational research: Problems and prospects. *Journal of Management*, 12(4): 531–544.
- Porter, M. E. 1990. *The competitive advantage of nations*. New York: Free Press.
- Poynter, T. A., & Rugman, A. M. 1982. World product mandates: How will multinationals respond?. *Business Quarterly*, 47(3): 54–61.
- Rugman, A. M., & Verkebe, A. 2001. Subsidiary-specific advantages in multinational enterprises. *Strategic Management Journal*, 22(3): 237–250.
- Stam, W., & Elfring, T. 2008. Entrepreneurial orientation and new venture performance: The moderating role of intra-and extraindustry social capital. *Academy of Management Journal*, 51(1): 97–111.
- Steensma, H. K., & Lyles, M. A. 2000. Explaining IJV survival in a transitional economy through social exchange and knowledge-based perspectives. *Strategic Management Journal*, 21(8): 831–851.
- Tang, J. X., Shi, J., & Bo, H. F. 2012. Study on the influence to hotel continuous innovation ability by organizational learning. *Tourism Tribune*, 27(8): 36–44.
- Tregaskis, O. 2003. Learning networks, power and legitimacy in multinational subsidiaries. *International Journal of Human Resource Management*, 14(3): 431–447.
- Tsai, W. 2000. Social capital, strategic relatedness and the formation of intraorganizational linkages. *Strategic Management Journal*, 21: 925–939.
- Tsai, W. 2002. Social structure of “coopetition” within a multiunit organization: Coordination, competition, and intraorganizational knowledge sharing. *Organization Science*, 13: 179–190.
- Uhlenbruck, K. 2004. Developing acquired foreign subsidiaries: The experience of MNEs in transition economies. *Journal of International Business Studies*, 35: 109–123.
- Williams, C., & Du, J. 2014. The impact of trust and local learning on the innovative performance of MNE subsidiaries in China. *Asia Pacific Journal of Management*, 31(4): 973–996.
- Yamin, M., & Andersson, U. 2011. Subsidiary importance in the MNC: What role does internal embeddedness play?. *International Business Review*, 20(2): 151–162.
- Zhan, W., Chen, R., Erramilli, M. K., & Nguyen, D. T. 2009. Acquisition of organizational capabilities and competitive advantage of IJVs in transition economies: The case of Vietnam. *Asia Pacific Journal of Management*, 26(2): 285–308.
- Zollo, M., & Winter, S. G. 2002. Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, 13(3): 339–351.

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