Reverse Knowledge Transfer from Subsidiaries to MNCs in Korea: Size Matters

Abstract

This paper attempts to identify the effects of knowledge transfer capacity and relational capital on the reverse transfer of local market information from subsidiaries within MNC networks. In particular, we try to examine the different influences of those determinants in organizations of different sizes. By using Spearman rank order correlation coefficients, we find that the key drivers for large subsidiaries are knowledge development capability, subsidiary autonomy and trust between subsidiaries and MNCs. The key drivers for medium-size firms are subsidiary willingness, trust and organizational distance. In the case of small firms, reverse knowledge transfer is driven by knowledge development capability, subsidiary autonomy and socialization mechanisms. We believe that these findings offer valuable implications for both MNC managers and also for theory.

Keywords: Multinational corporations, reverse knowledge transfer, local market information, knowledge transfer capacity, relational capital

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1 Introduction

Knowledge is often considered as a source of competitive advantage which strengthens and upgrades multinational corporations' market position in the global arena. As a result, multinational corporations (MNCs) tend to set up subsidiaries in foreign markets to access other firms' knowledge, which ranges from explicit skills embodied in certain products and processes to tacit information; though this is not the only motivation for the establishment of such subsidiaries (Inkpen and Dinur, 1998). Explicit skills (e.g., technological know-how) refer to knowledge that can be converted easily into systematic language and learned from guides, manuals and instructions. In contrast, tacit information is knowledge that is hard to formalize and is deeply rooted in organizational commitment. Thus, from the perspective of MNCs, the acquisition of tacit information, such as local market information (LMI), from subsidiaries is a difficult and frustrating process, but it must be attempted because the maintenance and development of organizational competitiveness are mainly dependent upon the absorption of tacit know-how (Park, Oh and Choi, 2012).

Overseas subsidiaries have a chance to access external knowledge, develop new competences themselves by using the opportunity, and share this information with their headquarters (i.e., MNCs). This contributes to the formation of MNCs' competitive advantages. Recent literature dealing with knowledge transfer/acquisition experiences has emphasized the importance of leveraging knowledge from strategically located subsidiaries (the previous trend of empirical examinations was based on the home-centric

view of knowledge flows from headquarters to subsidiaries) (Mudambi, Piscitello and Rabbiosi, 2014; Najafi-Tavani, Giroud and Sinkovics, 2012). In addition, discussion of empirics for observing and exploring subsidiary behaviors and characteristics is topical (e.g., Manolopoulos, Papanastassiou and Pearce, 2005; Manea and Pearce, 2006). When operating in foreign markets, overseas subsidiaries should fit into local business environments so that they can develop abilities to find out valuable information and integrate and blend various sources of local knowledge within MNC networks (Li, Poppo and Zhou, 2010). However, one problem is that the extant literature is focused primarily on international joint ventures and they often regard the joint ventures as a vehicle to transfer knowledge not only to local firms but also to foreign parents (e.g., Lane, Salk and Lyles, 2001; Park, 2010). So there needs to be an emphasis on the role of subsidiaries from a behavioural point of view and perhaps less of an emphasis on market entry strategy.

The efficient absorption of LMI is decisive for MNCs to achieve organizational competitiveness as it will be a crucial factor in the determination of the success of direct investment in foreign markets (Park et al., 2012). Pearce and his colleagues (Manea and Pearce, 2006; Manolopoulos et al., 2005; Pearce and Papanastassiou, 2006) shed light on the role of subsidiaries in the knowledge management process within MNC networks. According to them, MNCs increasingly establish overseas subsidiaries in order to actively seek opportunities to acquire foreign technological knowledge that has not been made available internally as well as unique information outside home markets and to apply new skills in hierarchical MNCs. By accessing and applying local technology and expertise in the product development process, new technological dimensions emerge in the subsidiary, which subsequently enlarge the group's knowledge trajectory. Thus, these subsidiaries help MNCs to access dispersed knowledge sources, as a crucial component of their MNC

network's innovative program. Therefore, compared to the transfer of technological knowledge, the investigation of knowledge sharing on LMI is sparse.

The level of knowledge sharing within MNC networks and reverse knowledge transfer (RKT) from subsidiaries to MNCs may be influenced by many factors (Ambos, Ambos and Schlegelmilch, 2006). For instance, Rabbiosi and Santangelo (2013) argue that subsidiaries have different levels of local embeddedness and characteristics, which determine the socialization mechanisms associated with their relationships with MNCs, and these elements may affect the level of subsidiaries' knowledge accumulation and subsequent RKT. In addition, subsidiary size is a critical factor of a subsidiary's capacity to amass capabilities and knowledge and to add value to MNCs via knowledge transfer (Park, Whitelock and Giroud, 2009). In addition, subsidiaries perhaps need to have sufficient knowledge development skills for RKT to make a contribution to the competitive advantage of parent firms (Iwasa and Odagiri, 2004). Also, the extent to which MNCs reversely learn local knowledge can be influenced by subsidiary willingness (Inkpen and Dinur, 1998), the trust relationship between MNCs and subsidiaries (Buckley and Park, 2013) and organizational heterogeneity (Ambos et al., 2006). These explanations indicate that the factors which determine RKT have not reached a consensus among researchers.

Based on the discussion above, we believe that the organizational size of subsidiaries matters for RKT in that larger size offers some advantages in terms of gaining support from MNCs and size often reflects the strategic position of a subsidiary. Similarly, Simonin (1997) finds that subsidiary size influences significantly the collaborative sharing of experience with headquarters. In a similar vein, Shenkar and Li (1999) suggest that large organizations have a propensity to share the knowledge possessed by their

MNCs more than small firms. According to Minbaeva et al. (2003), compared to small subsidiaries, large subsidiary size often means more important strategic positions within MNC networks, and thus a stronger strategic position allows better support and aids and other resources owned by the MNCs. However, previous studies have neglected the subsidiary size issue and thus we deem it to be important to investigate it empirically in the context of RKT.

Our attempt to fill these research gaps will employ knowledge transfer capacity and relational capital perspectives as overarching theoretical lenses. The next section will discuss the theoretical background.

2 Theoretical background: Knowledge transfer capacity and relational capital

According to Martin and Salomon (2003), the knowledge transfer capacity (KTC) of a firm can be categorized into two dimensions: capacity to develop knowledge and capacity to access knowledge. In addition, they define KTC as "the ability of a firm to articulate uses of its own knowledge, assess the needs and capabilities of the potential recipient thereof, and transmit knowledge so that it can be put to use in another location"(p.363). This definition emphasizes that KTC is dependent upon a firm's ability to understand the value of new external knowledge, identify the potential use of the knowledge and assimilate it appropriately for effective knowledge utilization. This is often referred to as a knowledge development process within MNC networks. MNCs, in fact, implement international expansion; in part, in order to acquire locally specific knowledge (i.e., LMI) which has not been available to it. However, the acquisition of the knowledge would not be plausible when overseas subsidiaries do not own basic competences to teach the knowledge (Martin and Salomon, 2003). Meanwhile, the basic

competences to instruct are commonly promoted when subsidiaries possess a range of prior relevant organizational skills and capabilities, which also help the teacher firms to access locally residing know-how. However, although subsidiaries meet the prerequisite by accumulating a sufficient stock of prior internal knowledge, some firms sometimes show a propensity to be reluctant to open their knowledge reservoir for various reasons (e.g., to maintain strategic importance within a MNC network). This is a serious obstacle to the enhancement of KTC and the smoothing of its occurrence, as such reluctance frequently results in subsidiaries losing their capability to transmit knowledge to targeted recipients (i.e., MNCs) in an appropriate way (Park, 2011). In this situation, a short-cut to uphold a subsidiary's motivation to be transparent is perhaps for MNCs allow the subsidiaries to enjoy organizational autonomy. This will also help subsidiaries to make a decision quickly in order to fit into changes in local business environments and cultivate autonomously own capability to determine how ready a recipient is to use and assimilate LMI, which will substantially increase subsidiary KTC.

In contrast, relational capital means the bundle of organizational components which grease headquarter-subsidiary relationships within MNC networks and which enlarge logically the extent of their cooperation and key knowledge sharing. In particular, with respect to the second issue (i.e., the sharing key knowledge between headquarters and subsidiaries), the presence of strong relational capital underpins the effective upkeep of socialization mechanisms which encourage communications and interactions within the networks, develops friendly relations and mutual trust, and promote their intent to lessen various organizational distances, such as cultural estrangement, psychic gap and goal heterogeneity. In other words, it is important to understand that although subsidiaries are efficient platforms for RKT, allowing MNCs to access LMI and giving them an

opportunity to learn the skills and competencies in local markets, the increase in the extent to which MNCs absorb local market knowledge is not likely to occur without appropriate socialization mechanisms (Najafi-Tavani et al., 2012), trust between know-how exchanging parties (Buckley and Park, 2013) and a minimum level of organizational distance (Ghauri and Park, 2012). This is because the maximization of the level of RKT from subsidiaries to MNCs is often accomplished by relational capital which promotes a favorable learning environment within an organizational context.

3 Hypothesis development

3.1 Knowledge transfer capacity

Knowledge development capability: Subsidiaries commonly receive knowledge from MNCs and simultaneously develop their own unique knowledge through local business activities. A subsidiary's ability to develop new knowledge is called knowledge development capability. This enables subsidiaries to re-create transferred knowledge into new information, thus allowing them to cultivate actively new values and support MNCs' achievement of strategic goals in local markets. Furthermore, it enables subsidiaries to complement, revise and integrate local knowledge associated with local residing technologies, culture, the external environment and people in such a way that they turn it into new local information. Such information can then be used by the subsidiaries to reversely transfer knowledge to their headquarters (Gold, Malhotra, and Segars, 2001).

New knowledge development is a major factor which influences RKT (Hankanson and Nobel, 2001). In other words, new and innovative information created through the knowledge development capabilities possessed by subsidiaries can serve as a lubricant

which enriches subsidiaries' knowledge reservoir which is a prerequisite for RKT (Bjorkman, Barner-Rasmussen, and Li, 2004). Piscitello and Rabbiosi (2006) stated that when a subsidiary has a competitive edge over other subsidiaries in terms of knowledge development capabilities, MNCs often have a propensity to take an interest in the knowledge produced by the subsidiary, which then functions as a prime mover to increase RKT. Yang, Mudambi and Meyer (2008) also argued that the knowledge development capabilities of the subsidiaries are crucial to RKT because timely transfer, and the sharing and usage of knowledge developed by the subsidiaries is essential to MNCs' competitiveness and success. In addition, Noorderhaven and Harzing (2009) suggested that if a certain subsidiary's knowledge development capabilities are relatively superior to those of other subsidiaries, it will tend to actively transfer its own knowledge to other MNC units. Hence,

H1. Knowledge development capability by subsidiaries will positively increase their reverse knowledge transfer to MNCs

Possession of prior related knowledge: According to Powell, Koput, and Smith-Doer (1996, p.120), '... knowledge facilitates the use of other knowledge. What can be learned is crucially affected by what is already known' (see also Park, 2012). In this sense, the capability for acquiring new knowledge is based primarily on the similarities between the prior related knowledge held by knowledge possessors and learners. Therefore, prior related knowledge provides the ability not only to understand new information, but also to recognize it (Ghauri and Park, 2012). However, the understanding of new information will be difficult when the prior knowledge of the acquirer is different from that of the

transferor.

From the perspective of RKT, an MNC that receives more related knowledge from its foreign subsidiary can save on various communication costs generated during the use of the relevant knowledge (Mudambi and Navarra, 2004). In other words, the knowledge possessed by the subsidiary is more likely to be transferred and used by the MNCs if there is strong knowledge connectivity between MNCs and the foreign subsidiary (Schulz, 2003). Bjorkman et al. (2004) stated that if a foreign subsidiary possesses the related information currently held by the MNCs, it is more likely that the information of the subsidiary will be transferred to the other subsidiaries. Lane, Koka, and Pathak (2006) found that knowledge connectivity between MNCs and the foreign subsidiary affects the perception and understanding of the MNCs regarding the knowledge transferred from the subsidiary. According to Yang et al. (2008), if there is strong knowledge connectivity between a MNC and a foreign subsidiary, the MNC will pay attention to the knowledge held by the subsidiary in search of potential benefits that can be acquired from the subsidiary's knowledge. McGuinness, Dermirbag, and Bandara (2013) also stated that a high level of congruence between the knowledge created by the foreign subsidiary in the local region and the prior knowledge of the MNC is an important factor which influences the MNC's transfer and use of subsidiary knowledge. Therefore, we established the following hypothesis:

H2: The possession of prior related knowledge by subsidiaries will positively increase their reverse knowledge transfer to MNCs

Subsidiary willingness: Knowledge transfer refers to the transfer of knowledge from

the transferor to the beneficiary. In this context, the willingness of the knowledge transferor is the willingness to dedicate its time and resources to knowledge transfer. Furthermore, the willingness of the knowledge transferor reflects the removal of the fear of losing one's ownership, status or superiority over knowledge and actively transferring the knowledge to the beneficiary (Szulanski, 1996). Knowledge transfer requires more than the possession of special knowledge; the company possessing the knowledge needs to be willing to transfer the knowledge to other companies (Lahti and Beyerlein, 2000). In other words, in order for the beneficiary to successfully acquire transferred knowledge, the knowledge transferor must show the willingness and intent to share own information (Grant, 1996).

Similarly, RKT cannot be achieved successfully if the foreign subsidiary is unwilling to transfer the locally acquired knowledge to the MNC. Gupta and Govindarajan (2000) stated that the willingness of a foreign subsidiary to share newly created local knowledge with other MNC units is positively related to the flow of the subsidiary's knowledge into other units. Najafi-Tavani et al. (2012) documented that the more willing a foreign subsidiary is to transfer knowledge to the MNC, the more likely it is that knowledge will be transferred successfully from the foreign subsidiary to the MNC. Therefore we hypothesize that

H3: Subsidiaries' willingness to share own information will positively increase their reverse knowledge transfer to MNCs

Subsidiary autonomy: The more autonomous a foreign subsidiary, the higher the level of localization, but the lower the level of dependence on MNCs. If a subsidiary has

strong autonomy, it will be able to acquire local knowledge by making appropriate decisions according to local circumstances. Moreover, because a subsidiary can build capabilities on its own, based on its flexibility in acquiring and interpreting local knowledge, it will not feel the need to be pressurized to transfer and share knowledge with the MNCs (Noorderhaven and Harzing, 2009). This is why many previous studies have viewed negatively the relationship between subsidiary autonomy and knowledge transfer to MNCs' units (Ghoshal and Bartlett, 1988; Gupta and Govindarajan, 2000).

However, since subsidiaries within a MNC's network each take on different roles, subsidiary autonomy does not always negatively affect knowledge transfer to other MNCs' units. Subsidiaries that are given independent autonomy for strategic reasons hold considerable power within a MNCs' network, and will make efforts to transfer locally acquired knowledge to the MNCs in an effort to hold onto such power (Mudambi and Navarra, 2004). According to Foss and Pedersen (2002), subsidiary autonomy positively influences the flow of knowledge to other subsidiaries, which is particularly relevant for knowledge originating from local clusters. Noorderhaven and Harzing (2009) hypothesized that subsidiary autonomy was negatively related to the transfer of knowledge to other MNC units. Empirical studies have showed that subsidiaries with greater autonomy transfer more knowledge to other MNC units. Rabbiosi (2011) found that when contributor subsidiaries that play a contributing role in MNCs possess a high level of autonomy, personal coordination mechanisms are activated further, raising the level of knowledge transfer from the subsidiary to the MNCs. Thus,

H4: Subsidiaries' autonomy will positively increase their reverse knowledge transfer to MNCs

3.2 Relational capital

Socialization mechanism: As knowledge transfer and RKT processes are enormously complex and hard to capture (due to inter-personal and inter-organizational dimensions), the use of appropriate knowledge transmission mechanisms is important to reinforce knowledge exchange between subsidiaries and their parent corporations (Schlegelmilch and Chini, 2003). Gupta and Govindarajan (2000) shed light on socialization as the crucial part of such knowledge transmission mechanisms. They argue that socialization mechanisms create interpersonal familiarity as well as organizational intimacy between subsidiaries and other units. In a similar vein, Khan, Shenkar and Lew (2015) also highlight that socialization mechanisms are socially interactive mechanisms at the inter-organizational level that enhance knowledge transfer between firms. They suggest further that such socialization mechanisms can be divided into formal socialization mechanisms and informal socialization mechanisms. According to Gupta and Govindarajan (2000), formal socialization mechanisms include liaison personnel, task forces and permanent committees and play a crucial role in mixing multiple units so that organizations exchanging knowledge develop into similar cognitive structures. Thus, the presence of abundant formal socialization channels between MNCs and subsidiaries positively influences knowledge transfer in the MNC-subsidiary relationship. In contrast, Rabbiosi and Santangelo (2013) suggest that informal socialization mechanisms such as mutual teamwork, meetings and visits between subsidiaries and parent firms (i.e., MNCs) function as a vehicle to share their knowledge in that such information is significantly embedded in human memories. This means that rich communication media are essential for the transmission of tacit information. In particular, as much of market relevant

knowledge, such as LMI, is tacit knowledge that is embedded in organizational practices and the cognitive structure of human bodies, the feasibility of its transfer requires intensive interactions between knowledge receivers and the transferors (Park et al., 2012). In this vein, frequent interpersonal communications in the daily routine, mutual meetings and headquarter visits enhance tacit knowledge transfer. These explanations indicate clearly that socialization mechanisms enlarge significantly the extent to which subsidiaries reversely transmit locally specialized knowledge and the level of interactions between subsidiaries and headquarters (Najafi-Tavani et al., 2012). In this vein,

H5: Socialization mechanisms will positively increase subsidiaries' reverse knowledge transfer to MNCs

Trust: In the process of knowledge transfer, various unexpected problems may arise, due to the differences in capabilities of knowledge transferors and acquirers. A common phenomenon in this situation is that even knowledge acquirers with appropriate absorption abilities often experience difficulties in gaining an accurate understanding of the knowledge embedded in the transferors. Therefore, for effective knowledge transfer, firms exchanging own knowledge need to build a favorable atmosphere based on a trust relationship which facilitates mutual understanding between transferors and acquirers, and which will then help them to solve any problems that may arise in the knowledge transfer process. In this sense, trust between knowledge exchanging parties is one of the key preconditions that may not only lead to effective knowledge transfer but also efficient RKT, particularly in the MNC-subsidiary relationship (Tsai and Ghoshal, 1998).

Given that local knowledge developed by foreign subsidiaries is highly implicit, they

must sustain contact and exchange for a long period in order to transfer their own knowledge to their headquarters (Lane et al., 2001). In this vein, trust developed between MNCs and subsidiaries in the long-term knowledge transfer process strengthens respect for one another's abilities as well as the absorption of common interests, which logically facilitates smooth knowledge transfer and reverse learning (Davenport and Prusak, 1998).

Dhanaraj, Lyles, Steensma, and Tihanyi (2004) proposed the concept of relational embeddedness measured by trust between MNCs and subsidiaries and documented that relational properties affect positively mutual knowledge exchange and sharing. Lane et al. (2006) confirmed from their empirical experiment that trust among MNC units positively influences active knowledge flow within MNC networks. Najafi-Tavani et al. (2012) argued similarly that internal embeddedness (i.e., trust) between MNC headquarters and old subsidiaries often plays a prime mover role in the initiation of the transfer of subsidiaries' knowledge to headquarters. These explanations lead to the following hypothesis:

H6: Trust will positively increase subsidiaries' reverse knowledge transfer to MNCs

Organizational distance: As MNCs set up foreign subsidiaries in various countries and regions, the organizational distance between MNC units is growing progressively (McGuiness, Demirbag and Bandara, 2013). Organizational distance, which affects international businesses, has been seen commonly as a multi-faceted construct that includes cultural, administrative, geographic, and economic aspects (Ambos and Ambos, 2009). According to conventional wisdom, the greater the organizational incongruence, the less likely it is that valuable knowledge and necessary information will be readily

available to the learning organization (Park et al., 2012). Organizational distance is also associated with higher transaction costs generated by the difficulty of transferring skills, information and competencies. Therefore, organizational distance may influence RKT (Rabbiosi and Santangelo, 2013).

Organizational distance can prevent the parent company and other MNC subsidiaries from understanding the essence of the knowledge possessed by the foreign subsidiary. In this sense, it can serve as a major obstacle to RKT, given that organizational differences between MNC units hamper the transfer of subsidiary knowledge (Rabbiosi and Santangelo, 2013). In a study of the relationship between knowledge coordination mechanisms and RKT, Ambos and Ambos (2009) examined the effects of controlling for organizational distance, which they defined as being composed of geography, culture and language. Their results showed that RKT was positively related to geographical distance, but negatively related to cultural distance. In a study of how RKT is related to the innovativeness of a foreign subsidiary, Mudambi et al. (2014) found that organizational distance was an influential factor, and thus used it as a control variable. The results of empirical analysis confirmed a negative relationship between organizational distance and RKT. Therefore, we established the following hypothesis:

H7: Organizational distance will decrease subsidiaries' reverse knowledge transfer to MNCs

Subsidiary size: Company size reflects the firm's power and resources, such as innovative development and creation of new knowledge (Bartlett and Ghoshal, 1989). Some scholars suggest that large organizations may suffer from inertia, which can in turn

obstruct learning (Lane et al., 2001). This view is supported by other studies that argue that smaller organizations may be more eager to gain more knowledge from parent companies when compared to larger organizations that can create knowledge on their own or have more opportunities to acquire knowledge from external sources. On the other hand, smaller organizations may lack the capability with which to create or purchase knowledge (Minbaeva et al., 2003).

In the context of RKT, subsidiary size is used as a variable to analyze the effect of various subsidiary activities, including the construction of a local network, the scale and scope of economic activities and the significance of activities carried out between MNC units (Yang et al., 2008). In other words, subsidiary size may serve as an indicator of the resources possessed by the subsidiary, and can thus affect factors that facilitate the transfer of subsidiary knowledge to MNCs according to subsidiary size (Gupta and Govindarajan, 2000). According to Bjorkman et al. (2004), factors that influence knowledge transfer may differ, depending on subsidiary size. Noorderhaven and Harzing (2009) examined various factors that affect the transfer of subsidiary knowledge to the parent company and other subsidiaries, using subsidiary size as a control variable. Their results showed that subsidiary size directly affects knowledge transfer to other subsidiaries, which indicates that the degree of knowledge transfer to other subsidiaries differs according to subsidiary size. Rabbiosi (2011) used relative subsidiary size as a control variable to study the relationship between RKT and the coordination mechanisms of MNCs according to subsidiary role. His empirical analysis showed that relative subsidiary size directly affected RKT regardless of subsidiary role. Furthermore, the effect of the cooperation mechanism of MNCs on RKT differed according to relative subsidiary size. These explanations lead to the following hypothesis:

H8: The factors affecting RKT to MNCs depend on subsidiary size

*** Insert Figure 1 about here ***

4 Methodology

4.1 Sample design and research method

To reiterate, our research objective is to identify factors affecting RKT from subsidiaries to their headquarters, and thus the sample for this study is subsidiaries established by MNCs. It may be argued that an adequate sample should be headquarters rather than subsidiaries in that teacher firms (i.e., subsidiaries) may think the transfer of local information is undertaken well and a lower level of RKT is mainly responsible for student firms (i.e., MNCs). This perhaps triggers common method and response biases. In order to examine whether this paper suffers common method bias we conducted three-way methods, but we did not find serious problems (this issue will be revisited again). In addition, we acknowledge the existence of response bias in case we examine the extent of RKT *per se* (in this situation, subsidiaries will insist they have transmitted a large amount of knowledge). However, we do not scrutinize it, but inspect channels facilitating the subsidiaries' RKT to their headquarters. In this vein, experiments toward subsidiaries would not be problematic.

The initial population was drawn from *Foreign Direct Investment* (2014) published by the Korean Ministry of Trade, Industry and Energy (MOTIE). *Foreign Direct Investment* (2014) is an official government publication and previous studies observing

the impacts of foreign direct investment in South Korea (hereafter, Korea) have also used the same data source (e.g., Ghauri and Park, 2012; Park and Choi, 2014). Three criteria were subsequently applied to reduce it to manageable sample size and accomplish precise empirical results: First, micro-sized subsidiaries with less than 50 employees were discarded because they may be run like personal or family businesses. This does not guarantee the substantial transfer of knowledge to firms in home markets. Second, at least two years of operational experience by 2013 was required as it will be difficult for young organizations to collect sufficient LMI in a short period of time. Third, only subsidiaries with foreign majority ownership were included in the database in that they are potentially liable for transferring LMI to their headquarters from the perspective of MNCs. Following the process, subsidiaries were double-checked by using an online website (http://dart.fss.or.kr/) which is able to check the actual operation of subsidiaries in Korea (this is a web site of Data Analysis, Retrieval and Transfer System authorized by the Financial Supervisory Service). When all these procedures were completed, a total number of 1,343 firms were finally selected for a questionnaire survey.

The questionnaire was posted to CEOs and executives, who were considered to be the most knowledgeable people in each firm. A total of 432 questionnaires were returned, giving a response rate of 32.2%. Further, we tried to confirm the minimum presence of non-response bias by using three key parameters (industry characteristics, the mode of entry and a comparison between subsidiaries established before the Asia crisis vs. after the event). We did not uncover a significant difference with regard to those three parameters, which indicates that non-response bias is minimal.

In addition, the presence of common method bias was also checked in line with the idea that data derived from the perceptual judgements of respondents possibly may be

biased by them. Harman's one-factor test is a common technique which is used as a means to identify the occurrence of the issue (Hair, Anderson, Tahtam and Black, 2005). The proportion of the variance criterion exhibits four dimensions: 'subsidiary willingness' and 'organizational distance' have high loadings on the first factor (22.26%); 'possession of prior related knowledge', 'subsidiary autonomy', 'trust' and 'reverse transfer of LMI' have high loadings on the second factor (16.54%); 'knowledge development capabilities' and 'socialization mechanism' have high loadings on the third factor (15.68%); and 'knowledge tacitness' has high loadings on the fourth factor (11.63%). These results show that the data collected from our survey do not experience common method bias. In order to confirm that the problem is negligible, the same 50 questionnaires were re-sent to respondents who previously had responded to the survey and posted to different directors and general managers in the sample subsidiaries who's CEOs and executives had responded. The fundamental reason to undertake the investigation is that the concern about common method bias can be discounted if the first (i.e., earlier survey) and the second survey responses are similar (Luo, 2006). 21 were received from the same respondents and 23 from other top management and no significant inconsistencies in responses were found.

4.2 Variable measurements

Our dependent variable is RKT from subsidiaries to MNCs and it was measured by seven items using a Likert-type scale. The detailed descriptions of the measurement are given in Appendix A. We include seven independent variables in the research framework, and their measurements were based on Likert-type questions (See Appendix B).

Five variables were also included to control the potential influences of other factors

on the RKT: (1) mode of establishment. The level of RKT can be affected by subsidiary formation. Thus, a dummy variable was created (1 for Greenfield subsidiaries and 0 others). (2) Industry characteristics. The knowledge transfer pattern of subsidiaries in the service sector should not be the same as that in manufacturing industries. Hence, another dummy variable was created (1 for service sector and 0 otherwise). Moreover, RKT can also be influenced by (3) organizational size[1] and (4) age. Size was assessed by the number of employees, whereas age was calculated by the number of years since creation of the subsidiary. Finally, the effect of knowledge tacitness was considered in that knowledge that is difficult to articulate and codify is logically difficult to transfer from one firm to another. We measured it by an average of twelve items asking whether 1) "it is hard to verbally transfer market data about (a) customers, (b) competitors, (c) marketing know-how, (d) distribution know-how, (e) market-specific technological know-how, (f) purchasing know-how to headquarters" and 2) "it is hard to encode and write down the same six different knowledge categories in reports or documents with the purpose of transferring the knowledge to headquarters."

5 Results and Discussion

5.1 Data reliability and validity: Confirmatory factor analysis

To check for any contradictions between the hypotheses developed in the research framework and our data, we conducted a confirmatory factor analysis (Hair et al., 2005). The results showed that the factor score of the measured variables had a significance level below 0.001. Therefore, no item was deleted.

*** Insert Table 1 about here ***

We examined χ^2, GFI, AGFI, RMR, CFI and RMSEA to evaluate the adequacy for producing the optimal composition of items by stage. The results showed that although the value of χ^2 fell below the standard, the other model fit indicators recorded 0.903, 0.879, 0.069, 0.908, and 0.061, respectively, which demonstrates a satisfactory model fit. We used the C.R (convergent reliability) coefficient to verify the internal consistency of each construct. All of the factors used for measurement recorded above 0.7, the internal consistency standard (Hair et al., 2005). Also, by testing C.R (convergent reliability) and AVE (average variance extracted), we found that the constructs exceeded the standard value (C.R>0.7, AVE>0.5) and therefore we were able to confirm that all measured items had convergent validity (Hair et al., 2005). Discriminant validity is confirmed when the average variance extracted value for each factor is bigger than the square value of the coefficient for two factors. As shown in Tables 1 and 2, the average variance extracted values for all factors exceeded the square value of the correlation coefficient, which confirms the discriminant validity of our data.

Strong correlations between variables were not found in the correlation matrix in Table 2, which confirms the minimum presence of multicollinearity. To check the level of multicollinearity among the variables, we also used the variance inflation factor (VIF) (see Table 3). Multicollinearity problems may exist when the value of VIF is high (e.g., above 5) (Hair et al., 2005). However, we did not find any evidence for multicollinearity in the VIF values. Therefore, all variables were included in the statistical analyses.

*** Insert Table 2 about here ***

5.2 Analysis strategy

The focus of this paper is to identify the key factors affecting RKT from subsidiaries to headquarters in Korea, indicating that we endeavor to find a cause-and-effect relationship between independent and dependent variables. Hair, Anderson and Tatham (1987: 20) indicate, ‘‘OLS regression analysis is a statistical technique that can be used to analyze the relationship between a single dependent (criterion) variable and several independent (predictor) variables.”

However, a problem is that we do not merely observe the phenomenon but attempt to scrutinize the effects of the factors for different organizational sizes (i.e., large, medium- and small-sized firms). According to the Scope of Korean SMEs published by the Korean Small and Medium Business Administration (2007), organizations are referred to as large firms when they employ more than 300 people. Companies employing fewer than 50 people are small firms. However, as explained earlier in the sampling procedure, this study discarded those micro subsidiaries (i.e., subsidiary size less than 50 employees) because they may not be involved in RKT activities, because they are possibly based on family business by foreign individual investors or such firms may not undertake important business operations in the market. Thus, we consider small firms when the number of employees is less than 100 people. Hence, subsidiaries employing 100 – 300 people are medium-sized firms. As a consequence, the sample sizes for each category are 62 (large-sized firms), 101 (medium-sized firms) and 264 (small-sized firms), respectively.

In this situation, the sample size for large firms is too small to conduct OLS

regressions. Keller (2012: 768) argues that the Spearman rank correlation coefficient can be an option to solve this problem and states that "one or both variables may be ordinal; or if both variables are interval, the normality requirement may not be satisfied. In such cases, we measure and test to determine whether a relationship exists by employing a nonparametric technique, the Spearman rank correlation coefficient". The Spearman rank correlation coefficient is a method of investigating the degree of correlation between two variables measured at the ordinal level. Park (2012) also utilized the same statistical method to overcome his small sample size problem when pursuing a similar research agenda (i.e., knowledge acquisition by subsidiaries from foreign parents in Korea).

Based on the explanations given above, we used the technique particularly for large-sized subsidiaries, and Model 1 in Table 4 is the statistical result from the method. Although we provide outcomes from Spearman rank order correlations, the sample sizes for small and medium-sized firms are large enough to conduct regressions. Thus, we also report outcomes from OLS regressions for those subsidiaries in order to see whether the results are consistent. Both Models 2-1 and 3-1 are the results from Spearman rank order correlations, whereas Models 2-2 and 3-2 are outcomes from regressions (this paper assumes that considering sufficient sample sizes for small and medium-sized firms, the results from Models 2-2 and 3-2 (i.e., regression analyses) are much more precise and robust, and thus emphasis has been added in those models by treating them as bold lines).

*** Insert Table 3 about here ***

5.3 Results

According to Table 3, the components which play a pivotal role in improving the

extent of RKT from large subsidiaries to their parent firms are ‘knowledge development capability’, ‘subsidiary autonomy’ and ‘trust between MNCs and subsidiaries’. However, the results are somewhat different for medium-sized firms, and the factors functioning as a springboard, which help them to jump into the high knowledge transferring subsidiary group, are ‘subsidiary willingness’, ‘trust’ and ‘organizational distance’ (‘organizational distance’ is negatively significant). Finally, the drivers positively influencing the extent to which subsidiaries transfer valuable LMI to MNCs in small-sized firms are ‘knowledge development capability’, ‘subsidiary autonomy’ and ‘socialization mechanisms”. (The results are generally parallel between the Spearman rank order correlations and the regressions).

5.4 Discussion

The results for the large and small-sized subsidiaries can be explained by the relationship between firm age and size. Although studies have different findings, a close correlation generally exists between firm age and size, which implies that older firms are larger in size, while newer firms are smaller (Rabbiossi and Santangelo, 2013). Studies on firm age have conducted research from one of two perspectives: the liability of newness and the liability of aging. Studies taking the liability of newness perspective state that older firms (i.e., large-sized firms) can make independent decisions based on accumulated experience, various tangible and intangible assets, and trust with internal and external shareholders, which in turn enables them to develop knowledge capabilities for achieving company-wide innovation (Sørensen and Stuart, 2000). From this perspective, older subsidiaries (large-sized subsidiaries) can make independent decisions to acquire and develop new, innovative LMI and can also build knowledge development

capabilities to check whether the LMI can be applied to the knowledge currently possessed by the MNCs (Zhou and Wu, 2010). Furthermore, these subsidiaries hold power equivalent to the parent company and contribute to building the innovative capacity of the MNCs. The authority and role of subsidiaries have been built on the trust that the MNCs have in the subsidiaries' longstanding contribution to MNCs' competitiveness (Mudambi and Navarra, 2004). To maintain trust with the MNCs and to hold onto their power and role within the MNCs' network, older and large subsidiaries that develop new knowledge will tend to transfer the knowledge to the MNC regardless of subsidiary willingness or organizational distance with the MNC. Moreover, because the MNCs trust in the older and the larger subsidiaries, they will be passive in utilizing mechanisms for sharing and socializing subsidiaries' knowledge. Socialization mechanisms are communication channels for integrating and sharing knowledge within MNC units. If there is strong trust between the MNCs and the subsidiary, the MNCs will believe that a subsidiary's knowledge will contribute to corporate competitiveness, and thus receive information directly from the subsidiary rather than deliberately use socialization mechanisms.

From the perspective of liability of newness to subsidiary size, large-sized subsidiaries can enhance the value of a MNC's network based on their abundant intangible/tangible resources, which they can use to build advanced knowledge development capabilities (Johnston and Menguc, 2007). Furthermore, with abundant resources, large-sized subsidiaries become less dependent on MNCs, and can also demand greater autonomy to utilize resources and do business according to local circumstances (Nohria and Ghoshal, 1997). To reiterate, to continuously maintain trust with the MNC, large-sized subsidiaries will make efforts to transfer LMI to the MNCs regardless of

subsidiary willingness, organizational distance, and the use of socialization mechanisms. Therefore, taken together, we can state that although knowledge development capability, subsidiary autonomy and trust between subsidiaries and MNCs affect RKT among large subsidiaries, subsidiary willingness, socialization mechanisms and organizational distance have no effect.

On the other hand, studies taking the liability of the aging perspective have argued that because newly born firms (i.e., small-sized firms) have no prior experience of failure, they are more likely to explore new and innovative knowledge that is highly uncertain but profitable when successful (Casillass, Acedo, and Barbero, 2010). Firms with a strong tendency to explore knowledge are capable of absorbing and digesting new and innovative knowledge, making decisions freely to invest and calculating the resources needed to develop this capability within the firm through effective knowledge exchange between organizational members (Ozsomer and Gencturk, 2003). Moreover, newer subsidiaries (i.e., small-sized subsidiaries) will try to utilize socialization mechanisms in an effort to persuade the MNCs that the new, innovative knowledge locally acquired and developed will contribute to the MNCs' competitiveness and capacity (Yang et al. 2008).

From this perspective of liability of aging to subsidiary size, small-sized subsidiaries will have a strong tendency to explore knowledge and will thus make decisions freely to develop further the new, innovative LMI currently not possessed by MNCs (Zhou and Wu, 2010). Small-sized subsidiaries do not possess the resources needed to develop LMI. However, since the LMI acquired or developed by the subsidiary can be profitable when successful, MNCs will provide the resources needed for the subsidiary to develop the new, uncertain LMI. Also, regardless of subsidiary willingness to share own information or organizational distance, small-sized subsidiaries can use socialization mechanisms to

transfer their LMI to the MNCs by persuading the MNCs that their LMI is new and innovative and can contribute to the MNCs' success. On the other hand, it is uncertain whether the LMI of small-sized subsidiaries will enhance the competitive edge of the MNCs, meaning that trust is not built between the subsidiary and MNCs. Therefore, although knowledge development capability, subsidiary autonomy and socialization mechanisms were found to influence RKT in small-sized subsidiaries, subsidiary willingness to share own information, trust between subsidiaries and MNCs and organizational distance were not significant influences on RKT.

Secondly, although subsidiary willingness to share LMI with MNCs', trust between subsidiaries and MNCs, and organizational distance were found to affect RKT in medium-sized subsidiaries, knowledge development capability, subsidiary autonomy, and socialization mechanisms did not have any effect. When compared to large-sized subsidiaries operating in the local market, medium-sized subsidiaries have relatively limited resources, which can undermine their organizational competitiveness (Hessels, 2008). To overcome this, medium-sized subsidiaries can cooperate with local suppliers, distributers and other stakeholders to acquire LMI and build knowledge development capabilities for integrating the acquired information with their internal abilities (Eriksson, Johanson, Majkgard, and Sharma, 1997). However, because these knowledge development capabilities have been developed with local stakeholders, medium-sized subsidiaries must ask for their understanding in transferring to the MNCs any LMI developed using these capabilities. This may lead to the assumption that the knowledge development capabilities of medium-sized subsidiaries will not affect the transfer of LMI acquired and developed by the subsidiary to the MNCs. However, if medium-sized subsidiaries have a strong willingness to share LMI with the MNC, they will ask local

stakeholders for their understanding and transfer knowledge to the MNC, which leads to a significant statistical association between subsidiary willingness and RKT in the subsidiary size.

Furthermore, medium-sized subsidiaries which are growing in size will gradually possess more resources to become less dependent on the MNCs, and will demand greater autonomy in carrying out business activities fitting with the local environment. The resource dependence theory argues that when a subsidiary grows in size, it will possess more resources for acquiring and developing new local knowledge to become less dependent on the MNCs in developing local knowledge, and will demand greater autonomy from the MNC (Nohria and Ghoshal, 1997). However, the MNC's control over the subsidiary can also grow with subsidiary size. Prahalad and Doz (1981) stated that when a subsidiary becomes bigger, a MNC will lose its ability to control the subsidiary, based on resources, and will thus create a sophisticated organizational context to strengthen their control. The organizational context consists of a common organizational structure, information system, compensation system and organizational culture, and can be seen as a mechanism for strengthening the connection and trust between the MNC and its subsidiaries (Prahalad and Doz, 1981). Thus, as medium-sized subsidiaries which are growing in size are controlled by the MNCs, subsidiary autonomy may not be seen as an influential factor for the transfer of LMI to the MNCs. However, as the control mechanisms of the MNCs create a common organizational structure, information system, compensation system and organizational culture between the MNCs and subsidiaries, it reduces organizational distance and strengthens trust between the MNCs and subsidiaries. Therefore, we can assume that organizational distance and trust between the MNCs and their subsidiaries will affect RKT from medium-sized subsidiaries to the MNCs.

Socialization mechanisms are generally perceived as a precondition to knowledge transfer between MNCs' units. Earlier studies also viewed socialization mechanisms as the main knowledge transfer channels of MNCs that can transform local tacit knowledge acquired by the subsidiary into explicit knowledge that can be understood and utilized by the MNCs (Gupta and Govindarajan, 2000; Khan et al., 2015; Rabbiosi, 2011). However, unlike previous research, this study showed that socialization mechanisms do not affect RKT from medium-sized subsidiaries to MNCs. This can be attributed to the distinct characteristics of Korean market entered foreign subsidiaries - the sample of this study.

After the 1997 Asian financial crisis, the Korean government actively opened up the doors to foreign investment to quickly transform the country into a transitional economy. This was characterized by a rise in direct investment by foreign MNCs (Park, Giroud, and Glaister, 2009). Febry and Zeghni (2003) argued that transitional economies using management methods based on an extremely strict hierarchical order generally lack communication capabilities for delivering the knowledge and information of corporate managers. Therefore, medium-sized subsidiaries in Korea may lack capabilities for delivering LMI and will not be able to use socialization mechanisms for transferring the LMI to the MNCs.

Finally, our results show that the possession of prior related knowledge does not significantly affect RKT, regardless of subsidiary size. This contradicts the results of the study by Cohen and Levinthal (1990). According to this study, if the knowledge transferor possesses the knowledge and related information desired by the knowledge beneficiary, it strengthens the ability of the beneficiary to absorb information, which positively affects the firm's learning process. However, it is also noteworthy that the study was focused not on tacit knowledge, but on technological knowledge. Unlike LMI, technological

knowledge is not significantly influenced by the environment or context of knowledge formation. Therefore, this implies that in acquiring tacit knowledge such as LMI, the ultimate effect of learning cannot be enhanced even if the transferor possesses knowledge related to the beneficiary; the beneficiary must have sufficient understanding of how the knowledge was formed.

6 Conclusions

We find that the key determinants influencing reverse transfer of LMI from subsidiaries and MNCs are different for different organizational sizes. The main factors for large subsidiaries are knowledge development capability, subsidiary autonomy and trust between subsidiaries and MNCs. However, for medium-size firms, the key elements are subsidiary willingness, trust and organizational distance. In small-sized organizations, RKT is affected by knowledge development capability, subsidiary autonomy and socialization mechanisms.

These findings offer practical implications to MNCs' managers. Factors commonly revealed as dynamic facilitators are knowledge development capability, subsidiary autonomy and mutual trust. As a consequence, MNC managers should provide high-quality education and training programs to employees working for subsidiaries so that they will be able to develop their own capabilities to identify the value of external knowledge, understand new information and assimilate it adequately in their memory, which ought to be a pre-requisite for the occurrence of RKT. Also, the statistical outcome of autonomy implies that MNC managers should co-operatively and actively support subsidiaries rather than coercively supervise and exercise tight control over them. Mutual trust is important, and thus managers should build headquarter-subsidiary relationships

based on trust. In addition, our findings indicate that it is crucial for MNC managers to try to boost knowledge transfer motivations specifically for medium-sized subsidiaries and pay particular attention to interactions and socializations with small-sized ones.

From a theoretical point of view, this paper emphasizes that the use of fragmentary theoretical concepts (e.g., the single use of absorptive capacity) is not sufficient to appreciate fully this complex phenomenon. Therefore it sheds light on the combination of subsidiary absorptive capacity (this concept was included in knowledge development capability), relational capital creating favorable learning environments and the KTC of knowledge possessors to draw an overall picture of RKT.

Although this paper provides important practical and theoretical implications we need to acknowledge the presence of some research limitations. First, because we focus on only one specific type of information, our contributions may not be exactly applicable to all other types of knowledge. Thus, other studies examining reverse transfer of, for instance, R&D skills or strategic management know-how, will extend our knowledge and offer a useful future research avenue. Second, our investigation is limited to Korea, which highlights a need to conduct similar empirical experiments in other contexts, so that we will be able to develop generalizable ideas. In addition, knowledge exchange occurs via a dyadic process, and thus it is better to look simultaneously at knowledge sharing in bi-lateral (i.e., MNCs-subsidiaries) knowledge flows. Finally, other variables, such as a subsidiary's strategic role, can affect the level of its knowledge transfer to their headquarters; thus the impact of the factor on RKT needs to be investigated in future research.

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Notes

1. Size is also included as a control variable in that the factor may also influence the extent to which subsidiaries transfer knowledge to their headquarters within the same organizational size category.
2. Hair et al. (2005) recommend that the minimum acceptable Cronbach's alpha value is .5 (that is, researchers can consider the data collected through survey are reliable if alpha values are above .5).

Table 1. Confirmatory Factor Analysis

Construct	Factor	Standardized Estimate	t-value	p-value	AVE	C.R
Knowledge Development Capability	DEV1	0.802	4.757	0.000***	0.654	0.850
	DEV2	0.865	5.922	0.000***		
	DEV3	0.755	4.135	0.000***		
Possession of Prior Related Knowledge	RELE1	0.748	5.243	0.000***	0.748	0.936
	RELE2	0.919	6.039	0.000***		
	RELE3	0.910	6.004	0.000***		
	RELE4	0.929	6.411	0.000***		
	RELE5	0.801	5.625	0.000***		
Subsidiary Willingness	WILL1	0.730	3.219	0.000***	0.517	0.810
	WILL2	0.734	3.452	0.000***		
	WILL3	0.769	3.236	0.000***		
	WILL4	0.637	2.701	0.000***		
Subsidiary Autonomy	AUTO1	0.759	3.628	0.000***	0.523	0.813
	AUTO2	0.716	3.572	0.000***		
	AUTO3	0.792	4.236	0.000***		
	AUTO4	0.612	3.038	0.000***		
Socialization Mechanisms	SM1	0.741	4.064	0.000***	0.518	0.804
	SM2	0.774	4.183	0.000***		
	SM3	0.681	3.674	0.000***		
	SM4	0.677	3.325	0.000***		
Trust	TRUST1	0.927	5.922	0.000***	0.832	0.937
	TRUST2	0.886	4.135	0.000***		
	TRUST3	0.923	5.571	0.000***		
Organizational Distance	DIS1	0.727	3.904	0.000***	0.521	0.844
	DIS2	0.788	4.161	0.000***		
	DIS3	0.716	3.895	0.000***		
	DIS4	0.739	3.912	0.000***		
	DIS5	0.630	2.921	0.000***		
Reverse Knowledge Transfer	KNOW1	0.838	4.374	0.000***	0.698	0.942
	KNOW2	0.832	3.933	0.000***		
	KNOW3	0.867	2.764	0.000***		
	KNOW4	0.878	2.799	0.000***		

	KNOW5	0.805	5.050	0.000***		
	KNOW6	0.817	4.165	0.000***		
	KNOW7	0.808	3.833	0.000***		

***p<0.01

χ^2(d.f)	GFI	AGFI	RMR	NFI	RMSEA
p>0.05	≧0.90	≧0.80	≦0.08	≧0.90	≦0.08
247.528(179), p=0.000	0.903	0.879	0.069	0.908	0.061

Table 2. Correlation Matrix

	Mean	SD	1	2	3	4	5	6	7
DEV	3.30	0.77	1						
RELE	2.55	1.09	-0.06	1					
WILL	3.49	0.61	0.19**	0.09	1				
AUTO	2.49	0.67	0.13**	0.12*	0.19**	1			
SM	3.11	0.60	0.20**	-0.05	0.11*	0.06	1		
TRUST	2.63	1.09	0.13**	0.27**	0.24**	0.17**	0.23**	1	
DIS	3.54	0.57	0.22**	0.07	0.89**	0.16*	0.17**	0.27**	1
KNOW	2.69	0.75	0.22**	0.10*	0.36**	0.30**	0.19**	0.26**	0.31**

Notes:

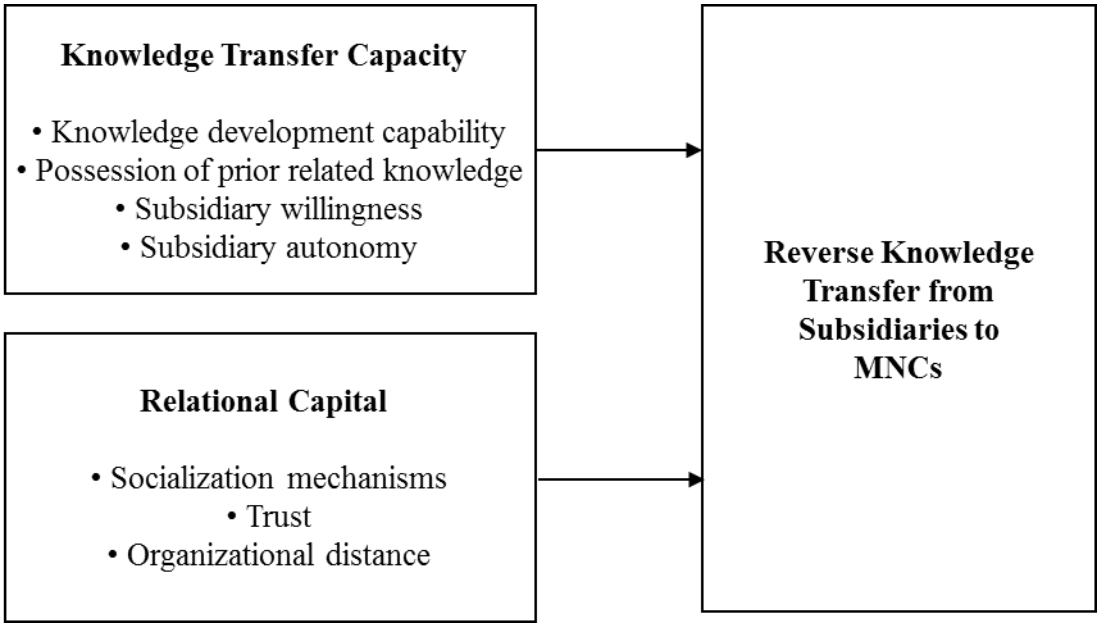
DEV: Knowledge Development Capability, RELE: Possession of Prior Related Knowledge, WILL: Subsidiary Willingness, AUTO: Subsidiary Autonomy, SM: Socialization Mechanisms, TRUST: Trust between MNCs and Subsidiaries, DIS: Organizational Distance, KNOW: Reverse Knowledge Transfer; ** P<0.01, * P<0.05

Table 3. Spearman rank order correlations and OLS regressions

Variables	Model 1 (N = 62)	Model 2 (N = 101)		Model 3 (N = 264)		VIF
		2-1	2-2	3-1	3-2	
Controls						
Mode of establishment	**-0.309***	-0.051	**0.017**	-0.010	**-0.061**	1.105
Industry characteristics	**-0.031**	-0.036	**0.002**	-0.045	**-0.075**	1.070
Size	**0.379****	0.237*	**0.240***	0.159**	**0.179****	1.111
Age	**-0.131**	-0.113	**-0.208***	-0.100	**-0.115**†	1.140
Knowledge tacitness	**-0.073**	0.050	**0.037**	0.059	**0.0147**	1.020
Transfer capacity						
Knowledge development capability	**0.267***	0.004	**0.060**	0.168**	**0.140***	1.168
Possession of prior related knowledge	**0.145**	0.206*	**0.032**	0.050	**0.022**	1.116
Subsidiary willingness	**0.174**	0.432**	**0.730*****	0.269**	**0.211**	4.772
Subsidiary autonomy	**0.385****	0.149	**0.071**	0.258**	**0.248*****	1.108
Relational capital						
Socialization mechanisms	**0.077**	0.168	**0.100**	0.284**	**0.130***	1.112
Trust	**0.387****	0.296**	**0.272****	0.175**	**0.033**	1.229
Organizational distance	**0.149**	0.294**	**-0.443****	0.250**	**-0.047**	4.860
R^2			**0.409**		**0.297**	
Adjusted R^2			**0.321**		**0.261**	
F			**6.669*****		**8.201*****	

Notes:
Spearman rank order: ** p<0.001; * p<0.05.
Regressions: † p < 0.10; * p < 0.05; ** p < 0.01; *** p < 0.001
5 respondents did not report information on firm size. Thus, they were not included in the analyses.

Figure 1. Research Framework



Note: With respect to their causal relationships, all factors are expected to be positive, except organizational distance.

Appendix A. Dependent variable (adapted from Gupta &Govindarajan, 1994; Najafi-Tavini et al., 2012)

Items (ranging from 1 = entirely disagree to 5 = extremely agree)	Cronbach's alpha
To what extent has this firm successfully transferred market data about (1) customers, (2) competitors, (3) marketing know-how, (4) distribution know-how, (5) market-specific technological know-how, (6) purchasing know-how, and (7) overall LMI to headquarters?	0.926

Appendix B. Independent variables

Variable	Measurement (ranging from 1 (entirely disagree / very little) to 5 (extremely agree / very much))	Cronbach's alpha
Knowledge development capability (adapted from Wang et al. (2004); Andersson et al. (2002)	(1) Our employees in the firm have adequate academic background to understand and use local market knowledge very well. We commit significant resources to educating and training (2) non-managerial and (3) managerial employees to master local market knowledge.	0.731
Possession of prior related knowledge (adapted from Park, 2011)	Compared to headquarters, how similar are (is) (1) the products, (2) the service, (3) the customers, (4) the basic technology, and (5) the basic skills which are (is) produced (or provided and shared) by this firm.	0.912
Subsidiary willingness (adapted from Najafi-Tavani et al., 2012)	To what extent does this firm have/make (1) motivation to transfer knowledge to headquarter, (2) organizational commitment to knowledge transfer within MNC networks, (3) relations with its main establishment purpose with knowledge transfer, and (4) relations between subsidiary knowledge transfer and appraisal by headquarters.	0.557[2]

(Continued)

Appendix B (continued).

Variable	Measurement (ranging from 1 (entirely disagree / very little) to 5 (extremely agree / very much))	Cronbach's alpha
Subsidiary autonomy (adapted from Miao et al., 2011)	This firm is freely making decisions in terms of (1) developments and changes in products/services for the domestic and export markets, (2) subsidiary human resource management, (3) financial management including pricing policy, and (4) marketing activities.	0.628
Socialization mechanisms (Adapted from Ghauri et al., 2013 and revised from Najafi-Tavani et al., 2012; Rabbiosi & Santangelo, 2013)	There are (1) efficient channels for communication and (2) frequent interfaces (i.e., visits and meetings) between subsidiaries and their headquarters. (3) Our employees are often dispatched to co-work with headquarters. (4) Managerial collaborative support by headquarters is common for this firm.	0.553
Trust (Created by this study)	(1) There is a high level of trust between headquarters and the top management of this firm. (2) We trust that headquarters will contribute to this firm. (3) We believe that headquarters trust that we will make no decisions detrimental to headquarters.	0.899
Organizational distance (Adapted from Li et al., 2007)	There is/are no (1) cultural misunderstanding, (2) cultural dissimilarity, and differences in (3) corporate vision, (4) the way for business practices and (5) organizational goals between this firm and headquarters.	0.645

Reverse Knowledge Transfer from Subsidiaries to MNCs in Korea: Size Matters

ACTIONS TAKEN FOLLOWING REVIEWER'S COMMENTS

Reviewer #2

We would like to thank the reviewer for the insightful and constructive comments, which have helped to refine the paper in many ways. We list below the actions we have taken as a result of the review (your questions are in Italic).

1. Page 2: The term MNCs which is the abbreviation of "multinational corporations" should be clarified on "line 2" of the introduction section.

Response: Thank you for letting us know our mistake. Based on the comment, we have corrected it.

2. Page 9: "In the perspective of RKT, an MNC that ...." Where the indefinite article "an" should be changed to "a".

Response: Again, thank you for the advice. We have carefully checked any grammatical errors before we resubmit the paper to the journal in this round.

3. Page 12 (line 12): "not discarded?"

Response: It was clearly our mistake, and thus it has been corrected in the revised version of the paper.

4. Page 20: "4.2 Variable measurements": should be "measurement"?

Response: As said in the second response, proof-reading has been done prior to resubmission. Thus, typos will not be presented any more.

5. Page 25: "5.4 Discussions" should be changed to "Discussion"?

Response: Our response is the same as the above.

6. Page 30: "6 Conclusions" should be changed to "Conclusion"?

Response: Our response is the same as the above.

7. Pages 26 and 27: There is no need to spell out the term "KIM" again which has been noted in the previous text.

Response: As suggested by the reviewer, we have carefully read our manuscript and corrected all similar errors in the text.