TRANSFERRING SUBSIDIARY KNOWLEDGE TO GLOBAL HEADQUARTERS:
SUBSIDIARY SENIOR EXECUTIVES’ PERCEPTIONS OF THE ROLE OF HR
CONFIGURATIONS IN THE DEVELOPMENT OF KNOWLEDGE STOCKS

ABSTRACT

Previous research has suggested that knowledge transfer is essential for firms’ competitiveness and that knowledge assets are economic goods key to organizational learning. We examine the role played by Human Resource Management (HRM) in the development of knowledge stocks (defined as human and social capital) and the association of such knowledge stocks with knowledge transfer from subsidiaries to headquarters (HQ) in multinational corporations (MNCs). We argue that subsidiaries’ human resource (HR) practices are antecedents of subsidiaries' knowledge stocks, and examine HR configurations conducive to building human and social capital. Drawing on a survey of 151 Australian subsidiary senior executives of US, German and Japanese MNCs, our findings suggest that the role of subsidiaries' HRM lies in nurturing ties between a subsidiary and its external stakeholders and in accumulating knowledge of strategic importance not only for the subsidiary but also for its HQ. Our findings suggest that the effective functioning of the subsidiary's HR practices is crucial, not only for management of local operations, but also for a subsidiary to be able to provide knowledge to its HQ, and in turn, to contribute to HQ’s knowledge acquisition.
INTRODUCTION

It has been suggested that a key area of potential competitive advantage for MNCs lies in their ability to transfer knowledge across national borders (Kogut & Zander, 1993), and that a critical purpose for firms is the creation and application of knowledge (Bierly & Chakrabarti, 1996). Indeed, it has been argued that the management of knowledge through knowledge transfer is essential for a firm’s competitiveness (Argote & Ingram, 2000) and that knowledge assets, such as human resources, are economic goods in themselves and key to organizational learning (Boisot, 1998; Nonaka, 1994). Despite numerous difficulties associated with knowledge transfer, the potential firm advantages make it critical for MNCs to develop managerial practices and processes that enhance knowledge transfer between headquarters (HQ) and subsidiaries, and amongst subsidiary operations.

In this paper we examine the role played by Human Resource Management (HRM) in development of knowledge stocks and the association between such knowledge stocks with knowledge transfer from subsidiaries to HQ, perceived by subsidiary senior executives. Following Gupta and Govindarajan’s (2000) definition, we focus on the transfer of “largely procedural types of knowledge (e.g., product designs, distribution know-how, etc.) … that exist in the form of ‘know-how’” but not on the transfer of “largely declarative types of knowledge (e.g. monthly financial data) … that exists in the form of ‘operational information’” (p. 474). We suggest that procedural types of knowledge are both tacit and explicit; however, the distinction between tacit and explicit knowledge cannot easily be made because they are often closely linked and difficult to separate (Styhre, 2004).

Building upon Youndt and Snell’s (2004) framework of human resource (HR) configurations and knowledge stocks, and Gupta and Govindarajan’s (2000) knowledge transfer research, we investigate the process of knowledge transfer from subsidiaries to HQ, perceived by
subsidiary senior executives. While extant research has largely focused on the transfer of strategy, policy and practice from HQ to subsidiaries with an assumption that best practice is located at HQ, our research is salient in highlighting the knowledge stocks that are held in subsidiaries. Further, our study dovetails with recent research suggesting that subsidiaries are important knowledge providers; not merely knowledge recipients (Mudambi & Navarra, 2004). Previous studies have suggested that HR practices and knowledge-related outcomes are associated, although it has also been recognized that theoretical interpretation and empirical support of this association are yet to be investigated (Minbaeva, 2005). Our study offers a valuable contribution to extant research as one of the few empirical studies examining the role of HR practices in the development of knowledge stocks, leading to transfer of knowledge from subsidiaries to HQ.

Bringing together human capital theory and social capital theory, with HRM and knowledge transfer literature relating to knowledge stocks, we develop and test a model that seeks to explain first, associations between HR configurations in a subsidiary and knowledge stocks (defined in this paper as human and social capital), and second, associations between knowledge stocks of a subsidiary and knowledge transfer from a subsidiary to HQ.

**HUMAN CAPITAL, SOCIAL CAPITAL, AND KNOWLEDGE TRANSFER**

We focus on HR practices as one of the group of management practices that assist in developing knowledge stocks that facilitate knowledge transfer in MNCs. A knowledge stock may be defined as the existing level of available knowledge held in an organisation at a point in time (Boudreau, 2003). In particular we explore the development of subsidiaries’ knowledge stocks through two types of capital, namely, human capital (HC) and social capital (SC). There are key rationales for our focus on HC and SC. First, HC and SC are two of the three sub-components of “intellectual capital”, or knowledge repositories, accessible for a firm (Wright, Dunford, & Snell, 2001); we focus on HC and SC because of our emphasis on procedural types
of knowledge, which comprise both tacit and explicit knowledge. Unlike HC and SC, organizational capital (the third sub-component of intellectual capital) consists mostly of explicit and declarative types of knowledge, stored as documents and databases within a firm (Wright et al., 2001), and is beyond the scope of this paper. Second, HC and SC are conceptually more related to each other than either is related to organizational capital as SC influences the creation of HC (Coleman, 1988) and SC complements HC (Burt, 2001).

We acknowledge that there is a view that HC and SC are not stocks of a firm; HC or SC can be lost once a person who holds a particular knowledge or relationship leaves a firm, and therefore, knowledge may not ‘accumulate’ as stocks within a firm. We also acknowledge that SC is essentially a dyadic concept where one party on one side of a relationship alone cannot ‘possess’ the capital. However, we argue from the premise presented in Wright et al.’s (2001) conceptual framework that HR practices generate value in accumulating knowledge resources within a firm, and henceforth in the development of HC and SC as knowledge stocks, particularly when combined into systems of practices as investments into employees of a firm.

**Human Capital as Knowledge Stocks**

HC, defined as the aggregate of skills and expertise held by employees, is a type of knowledge stock that may be leveraged through systems of HR practices (Hatch & Dyer, 2004). HC theory (Becker, 1975) postulates that human resources (employees and managers) are a firm asset in which firms need to invest. According to HC theory, firms ‘purchase’ or acquire HC from the external labor market through HR practices like recruitment and selection. Further, firms invest in employees and ‘make’ HC through HR practices like training and career development when they need to retain employees’ firm-specific skills and knowledge that are not readily available for purchase from the external market. In addition to acquiring and training employees, HC theory proposes the necessity for employee retention through HR practices designed to
motivate and provide employees with opportunities to leverage their HC. Therefore, HR practices can be regarded as one of the antecedents of HC.

**Social Capital as Knowledge Stocks**

SC is defined as “the sum of the actual and potential knowledge resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit” (Nahapiet & Ghoshal, 1998, p. 243). Like HC, SC is another important asset for a firm (Wright et al., 2001). This asset is possessed and utilized jointly by parties involved in the network of relationships (Bourdieu, 1986). Thus, SC of a firm is a “collective good” rather than a pure public good as the use of SC is non-rivalrous (i.e. the use of it by one party does not prevent another party involved in the relationship from using it) but is excludable (i.e. other parties outside the relationship cannot access SC embedded in a particular relationship) (Adler & Kwon, 2002; Kostova & Roth, 2003). A firm can access such an asset (Burt, 1992) and can utilize it for different purposes within the firm (Coleman, 1988). Further, we adopt the view that SC can also be a stock of knowledge, because it accumulates and depreciates over time (Putnam, 1993). Therefore, SC requires continuous investments to be maintained because efficacy of social relationships is lost if the relationships are not renewed or reconfirmed (Adler & Kwon, 2002). This implies that management practices should be utilized to maintain SC.

For instance, strategic management scholars consider that SC can be enhanced and built on as a source of competitive advantage through management practices (Ireland, Hitt, & Vaidyanath, 2002). Indeed, it has been suggested that HR practices can facilitate the formation of SC (Lengnick-Hall & Lengnick-Hall, 2003). For example, SC available to a firm can be built when employees are working in teams, and those employees are encouraged to learn from their colleagues and/or parties external to the firm such as customers, suppliers, and alliance partners. Therefore, HR practices can be regarded as one of the antecedents of SC.
Reflecting its multi-faceted characteristics, SC takes various forms. Nahapiet and Ghoshal (1998) identified three inter-related dimensions of SC: (1) the structural dimension, which represents the overall pattern of relationships between parties; (2) the relational dimension, which represents the kind of relationships that parties have developed with each other over time (e.g. such as respect, friendship, trust, and norms); and (3) the cognitive dimension, which represents shared interpretations, codes, and narratives between the parties involved in the relationship. Our paper focuses on the structural dimension of SC and we argue that HRM contributes to the formation of the structural dimension by facilitating interpersonal relationships amongst subsidiary employees as well as those between the employees and people who are external to the subsidiary. We focus on the structural dimension of SC because this dimension influences the development of the relational and cognitive dimensions of SC (Nahapiet & Ghoshal, 1998), and thus, the structural dimension forms the basis of other two dimensions.

The structural dimension of SC involves the analysis of network structure that is formed between parties involved in social relationships. Two competing views are found in SC literature concerning the analysis of network structure. The first view is called “network closure”, which mirrors the idea that SC derives from a dense network in which every party is well connected to each other (Coleman, 1988). Coleman (1988) argued that having strong and dense relationships between different parties contributes to formation of SC because the closely knit ties form trusting relationships will eventually benefit the parties involved in the network. The second view is called the “structural holes” or sparse network, which concerns the sparse and weaker connections between parties (Burt, 1992). Burt (1992) emphasized the importance of having a sparse network as SC because an individual or a group placed in the midst of a sparse network with many structural holes will have better competitive advantage compared to an individual or a group that is part of a tightly knit and closed network (i.e. network closure). This is because the
individual or group with sparse networks (i.e. structural holes) possesses less redundant and thus more valuable knowledge (Burt, 1992). Similarly, Granovetter (1973) argued that “strong ties”, or having strong relationships, bear redundant information, while “weak ties”, or having infrequent and distant relationships, bear new and non-redundant information.

It has been suggested that a point of integration of these competing views about network structure rests in the type of SC concerned; whether SC is formed within a particular group or whether it is formed with external parties (Adler & Kwon, 2002; Burt, 2001). At the firm level, the former type is called internal SC, which arises from the relationships between employees within a firm (Leana & Pil, 2006). The latter type is called external SC, which arises from the relationships between a firm and stakeholders external to the firm boundary (Leana & Pil, 2006). According to Adler and Kwon (2002), internal SC and external SC are not mutually exclusive; while internal SC (associated with network closure) benefits the firm and its members through shared resources based on trust, external SC (associated with structural holes) benefits the firm as a source of non-redundant resources that contribute to the competitive advantage of the firm.

In the MNC subsidiary context, internal SC comprises actual and potential knowledge resources embedded within, available through, and derived from the network of relationships between employees and managers within a subsidiary. From the network closure viewpoint (Coleman, 1988), nurturing close and dense relationships between co-workers within a subsidiary through HR systems is likely to contribute to the formation and maintenance of internal SC.

In the MNC subsidiary context, external SC can be divided into two types: (1) SC that derive from the network of relationships between a subsidiary and firms external to the MNC; and (2) SC that is derive from the network of relationships between a subsidiary and other units of the MNC. When we view an MNC as an inter-firm network comprising HQ and overseas subsidiaries, as defined by Ghoshal and Bartlett (1990), the HQ and other subsidiaries of the
same MNC can be viewed as the external counterparts for a focal (individual) subsidiary.

First, we limit external SC to the knowledge resources deriving from relationships between a focal subsidiary and its customers, suppliers, and alliance partners. From the premise of structural holes (Burt, 1992), we argue that forming relationships between external stakeholders offers value for a subsidiary as the relationships between external stakeholders provide opportunities for a subsidiary to understand customer needs, market conditions, and information on competitors. Hence, HR systems that encourage subsidiary employees to interact with external stakeholders become important for a subsidiary to nurture and maintain external SC.

Second, we name the knowledge resources that are deriving from the relationships between a focal subsidiary and the rest of the MNC as ‘intra-MNC SC’. Intra-MNC SC is ‘internal’ SC for an MNC at the corporate level, but it is at the same time a type of ‘external’ SC for a subsidiary. Therefore from the premise of structural holes (Burt, 1992), we argue that forming relationships between a subsidiary and other units of the same MNC offers value for a subsidiary. Kostova and Roth (2003) proposed that the SC of individual boundary spanners, or subsidiary employees who have, or used to have, direct contact with the HQ, is critical to the development of SC between a subsidiary and its HQ. Their argument on the role of boundary spanners suggests that a subsidiary’s HR practices that encourages employees of the subsidiary to interact with people from the parent and/or other subsidiaries becomes important for a subsidiary to nurture and maintain intra-MNC SC.

Knowledge Stocks and Subsidiary-to-Headquarters Knowledge Transfer

Previous research suggests that the knowledge sender’s characteristics are antecedents of the degree of knowledge transferred to the recipient (Minbaeva, 2007; Minbaeva & Michailova, 2004). This implies that the subsidiaries’ characteristics as knowledge senders need to be considered. Rugman and Verbeke (2001) examined subsidiary-specific advantages, suggesting
that a subsidiary’s knowledge stocks may be utilized as a valuable asset for an MNC’s HQ if the knowledge stocks are unique to the subsidiary and cannot be obtained from within HQ or other subsidiaries of the MNC. Utilizing Krone, Jablin and Putnam’s (1987) review of communication theory, Gupta and Govindarajan (2000) developed and empirically tested a theoretical framework of antecedents of intra-MNC knowledge transfer and showed that there was a positive association between the value of knowledge stocks and knowledge transfer from a focal subsidiary to HQ. We extend this argument by using HC and SC as proxies of subsidiary knowledge stocks.

Other studies on knowledge transfer have suggested that both HC and SC of the knowledge sender are antecedents of knowledge transfer. Minbaeva (2007) and Minbaeva and Michailova (2004) empirically tested the role of motivation and ability of employees of the knowledge sending unit in contributions to knowledge transfer. Their findings suggest that ability of subsidiary employees, which is similar to subsidiaries’ HC, is an antecedent of knowledge transfer. Tsai and Ghoshal (1998) empirically tested Nahapiet and Ghoshal’s (1998) theoretical framework and showed that the structural dimension of SC, together with the relational and cognitive dimensions, is an antecedent to knowledge transfer. Tsai (2002) concluded that the more the units within a firm had social interaction, the more they shared knowledge. Similarly, Björkman, Barner-Rasmussen, and Li (2004) and Persson (2006) reported socialization within an MNC as an antecedent of knowledge transfer. These findings imply that SC is an antecedent of knowledge transfer within an MNC. Thus, we suggest that the value of a subsidiary’s HC and SC (i.e. knowledge stocks) influences the extent to which there will be knowledge transfer from a subsidiary to HQ. Figure 1 presents the broad conceptual framework of this paper, illustrating the associations between HR systems, knowledge stocks (HC and SC) and knowledge transfer.

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Subsidiary’s HR configurations and Subsidiary’s Knowledge Stocks

We argue that subsidiaries’ HR practices are one of the antecedents of subsidiaries’ knowledge stocks (HC and SC) and examine the types of HR configurations that are conducive to building HC and SC. Our research builds upon Youndt and Snell’s (2004) configurational HR framework which links HRM to HC and SC. Other studies such as Bontis (2001) and Bontis, Crossan, and Hulland (2002) presented HC and SC as a part of three sub-sets of “intellectual capital”. SC constructs as found in these studies were called “customer capital”, which is similar to external SC in our study, and “the group-level learning stocks” and “the organizational level learning stocks”, which are similar to internal SC in our study. However, Bontis and his colleagues’ studies do not focus on management practices which develop these knowledge stocks. Indeed, Youndt and Snell’s (2004) study offered the only framework which linked HR practices and SC at the time our study had been planned.

The theoretical assumption behind the configurational approach to HRM is that a holistic and systematic approach should be utilized in examining the link between HRM and firm performance. The configurational approach emphasizes the importance of “horizontal fit” between individual HR practices that mutually enhance firms’ performance and competitiveness when they are systematically combined (Delery, 1998; Gerhart, 2007). The configurational approach and examines horizontal fit of HR practices by identifying different sets or configurations of HR practices rather than just bundling different HR functional areas.

In Youndt and Snell’s (2004) model, the HR configurations are not mutually exclusive but present a range of options that firms may utilize in their HR practices. Individual HR practices are grouped into six configurations. Each configuration consists of two or more individual functions of HR such as staffing, training and development, rewards management, and performance assessment. The latter two configurations (i.e. the Documentation and the
Information Technology HR configurations) are linked to organizational capital, which is related to largely declarative type of knowledge and is beyond the scope of this paper. The first configuration based on HC theory, the Acquisition configuration, is defined as firms’ ‘purchase’ of HC through HR practices such as recruitment and selection; practices which are utilized when requisite skills and expertise are readily available from the external labor market (Becker, 1975). It can be argued that when an MNC subsidiary utilizes the Acquisition configuration it will enhance the HC of that subsidiary. Thus we hypothesize:

H1: The Acquisition configuration will be positively associated with a subsidiary’s human capital.

Second, the Developmental configuration is also based on HC theory, which suggests that firms invest in ‘making’ or developing HC through HR practices of training, education and career development where employees possessing the requisite skills and abilities cannot be obtained from the external market. HC theory suggests that firms will invest in educating employees in firm-specific skills that cannot then be transferred to organizational competitors (Becker, 1975). Youndt and Snell (2004) propose that training and education should be supported by practices related to career development such as promotion-from-within, performance feedback, and skill-based pay systems. Thus, we hypothesize:

H2: The Developmental configuration will be positively associated with a subsidiary’s human capital.

Third, the Collaboration configuration comprises HR practices that encourage working in teams and networking within and outside of a firm. Youndt and Snell (2004) argue that encouragement of team-working and networking (a) between employees across different functional groups, and (b) between employees and people from external firms such as customers and suppliers, leads to improvement of SC of a firm. Likewise, Lengnick-Hall and Lengnick-Hall
(2003) suggested that HRM could nurture relationships that enhance SC of a firm by becoming partners with line managers and employees. Encouragement of teamwork also involves compensation practices such as group-based incentives, teamwork training, and selection of job candidates who have demonstrated skills in collaborating with others (Youndt & Snell, 2004). The Collaboration configuration is believed to improve SC of the firm. As we suggested earlier, SC in the context of an MNC subsidiary is threefold: (a) internal SC, which derives from the relationship between subsidiary employees and their co-workers; (b) external SC, which derives from the relationship between subsidiary employees and their external stakeholders such as customers, suppliers, and alliance partners; and (c) intra-MNC SC, which derives from the relationship between subsidiary employees and people from other units of the same MNC.

Considering all three types of SC, we hypothesize the following:

\[ H3a: \textit{The Collaboration configuration will be positively associated with a subsidiary’s internal social capital.} \]

\[ H3b: \textit{The Collaboration configuration will be positively associated with a subsidiary’s external social capital.} \]

\[ H3c: \textit{The Collaboration configuration will be positively associated with a subsidiary’s intra-MNC social capital.} \]

Fourth, the Egalitarian configuration consists of practices designed to create and maintain a ‘flat’ firm structure rather than a highly hierarchical one. The rationale is that the flatter the firm, the more empowered the employees will be, and the more they will be prepared to share knowledge within the firm (Cabrera & Cabrera, 2005; Youndt & Snell, 2004). This configuration includes firm practices such as having fewer job ranks and a narrow range of pay grades (Pfeffer, 1994). The Egalitarian configuration is only linked to internal SC as this configuration affects subsidiary employees’ relationships amongst themselves but not with external stakeholders. Thus,
we hypothesize:

*H4: The Egalitarian configuration will be positively associated with a subsidiary’s internal social capital.*

**Subsidiary’s Knowledge Stocks and Subsidiary-to-Headquarters Knowledge Transfer**

Gupta and Govindarajan (2000) supported the positive association between subsidiary’s knowledge stocks and subsidiary-to-HQ knowledge transfer, particularly when a subsidiary possesses knowledge stocks that is not duplicable and is valued by the rest of the corporation. They treated mode of entry, subsidiary size, and relative economic level of the host country as proxies of subsidiary knowledge stocks. While we recognize the importance of considering the role of entry mode and subsidiary size, we extend their conceptual framework by exploring HC and SC as proxies of subsidiary knowledge stocks. Our research also differs from Gupta andGovindarajan’s (2000) in that our study is conducted in the context of countries with high levels of economic development, so we exclude the relative economic level from our analysis.

As we have previously argued, where HC residing in the subsidiary employees is considered strategically important to an MNC subsidiary, the HQ will seek to transfer knowledge from subsidiary to HQ. Thus, we hypothesize:

*H5: A subsidiary’s human capital will be positively associated with knowledge transfer from a subsidiary to headquarters.*

A subsidiary’s internal SC is also part of its knowledge stocks. Internal SC will be positively associated to the degree of knowledge transfer from a subsidiary to HQ because a unique host country environment will produce a different kind of knowledge resources amongst employees than that exists at HQ. Subsidiaries that have access to additional, different knowledge stocks will be able to transfer such knowledge to HQ as a source of competitive advantage (Rugman & Verbeke, 2001). Thus, we hypothesize:
H6: A subsidiary’s internal human capital will be positively associated with knowledge transfer to headquarters.

A subsidiary’s external SC, which is the knowledge resources deriving from its relationships with external stakeholders, is another attractive knowledge stock for HQ. Because HQ cannot directly access the external stakeholders, the subsidiary becomes a key agent for transferring knowledge. For example, the relationship between international customers and the subsidiary will be of particular importance to HQ given that knowledge accumulated between a subsidiary and a customer in a particular host country may be applicable to the MNC’s other international operations (Montgomery & Yip, 2000). Thus, we hypothesize:

H7: A subsidiary’s external social capital will be positively associated with knowledge transfer from a subsidiary to headquarters.

Intra-MNC SC is the knowledge resources deriving from the relationships between a subsidiary and HQ and other subsidiaries of an MNC. Extant literature suggests that the informal and formal socialization within MNCs is one of the factors affecting the extent to which knowledge transfer occurs (Björkman et al., 2004; Persson, 2006). This body of literature suggests that both the HQ-subsidiary relationship (vertical socialization) and the subsidiary-subsidiary relationship (lateral socialization) are antecedents of knowledge transfer. For example, some host countries have business environments based on similar legal systems that can be very different from that of the HQ location. For example, two subsidiaries which are located in different host nations (e.g. Australia and Singapore) with similar legal systems (Common Law) may have a shared understanding of the local legal environments with which HQ (e.g. Germany) may not be familiar. This means that knowledge resources available from the subsidiary-to-subsidiary relationship may benefit HQ in developing international operation strategies for yet another location (e.g. India). Thus, we hypothesize:
H8: A subsidiary’s intra-MNC social capital will be positively associated with knowledge transfer from a subsidiary to headquarters.

Figure 2 presents the hypothesized model for this research.

--- Figure 2 about here ---

METHOD

Sample and Procedure

A self-administered mail survey was distributed to senior executives in 1000 Australian subsidiaries of US, German, and Japanese MNCs in October 2006. The questionnaire was mailed directly to the most senior executive of each subsidiary. This is because subsidiary senior executives are the most suitable respondents for the survey due to the three key roles that they are expected to play in MNCs’ international operations; (1) the sensor and interpreter of local business opportunities and competitions, (2) the developer of local resources and capabilities, and (3) the contributor to global strategy of the MNC (Bartlett & Ghoshal, 1989). We were interested in investigating their perceptions of the constructs under study based on their local as well as global business experience. Random sampling was utilized with contact details for the cohort of potential respondents obtained from three sources, namely: (1) USA/Australia Trade Directory 2006 (American Chamber of Commerce in Australia, 2006); (2) German Subsidiary Companies in Australia 2005/2006 (German-Australian Chamber of Industry and Commerce, 2005); and (3) Japanese Overseas Investment (Country Edition) 2006 (Toyo Keizai Shimposha, 2006).

A draft of the questionnaire was piloted with ten individuals with knowledge of international business. The questionnaire was then translated to Japanese following Brislin’s (1970) back-translation method. A German language version was not prepared as earlier research has suggested that managers of European MNCs generally have a good command of English (Harzing, 1999). Therefore, the English version was sent to US and German firms. Both English
and Japanese versions were sent to Japanese firms.

Of the 1000 questionnaires distributed, 151 complete and useable questionnaires were returned by the end of 2006, representing a 15.6% response rate. Of the completed questionnaires, 31 were from US firms (8.3% response rate), 49 from German firms (15.4% response rate), and 71 from Japanese firms (26.0% response rate). The firms represented a multi-industry background. The age of the subsidiaries (number of years since establishment in Australia) varied considerably from less than a year to 148 years, with a mean of 23.47 years ($SD = 18.88$).

As we anticipated, the majority of the senior executives who responded to the survey had sufficient international and domestic work experience to be able to answer our questions. Sixty-four per cent of the respondents had been working in their subsidiaries for more than three years; 86% of the respondents had been working in the same MNC for more than three years. More than 68% of the respondents had been expatriated for more than a year. In addition to these personal characteristics making these respondents well-informed, about 75% of the sample consisted of small sized firms with fewer than 100 employees. Senior executives of smaller firms are more likely to be aware of issues related to HRM and knowledge of the subsidiary. The mean subsidiary size (approximate number of employees) was 140.28 ($SD = 339.02$). Therefore, we argue that our respondents’ perceptions of HRM and knowledge processes were reliable and valid.

**Measures**

*HR configurations.* We utilized four measures adapted from Youndt and Snell’s (2004) HR configuration indices. The Acquisition configuration consisted of four items measuring staffing and compensation. The Developmental configuration included nine items measuring training, performance appraisal, and compensation. The Collaboration configuration had ten items, including staffing, training, performance appraisal, and compensation. Prior research has suggested that global HR practices, such as cross-border joint committees and task forces or
international training programs, can provide good face-to-face networking opportunities between subsidiary employees and people from other units of the MNC (Harzing, 1999). In particular, these networking opportunities are also likely to lead the subsidiary to have higher levels of intra-MNC SC (Kostova & Roth, 2003). Therefore, we added two items in addition to the original eight Collaboration items. The Egalitarian configuration included six items related to organizational structure and compensation. We added a sixth item to the original five items in order to provide some reflection on the Australian industrial relations context (Hall, 2006). The list of the 29 items utilized is provided in Appendix A. All items were rated using a five-point Likert type scale ranging from 1 = “strongly disagree” to 5 = “strongly agree”.

Following Youndt and Snell (2004), the HR configurations were constructed as formative measures. The use of indices is based on the assumption that firms can improve the level of knowledge stocks either by increasing the number of practices they employ within a configuration or by using the practices within a configuration in a more comprehensive way (Youndt, Snell, Dean, & Lepak, 1996). Unlike reflective measures where items are alternative indicators of a unidimensional construct, formative items (e.g. HR practices) do not have to be highly correlated to each other and may be mutually exclusive. Thus, techniques designed for validating reflective measures (e.g. Cronbach’s alpha coefficient and factor analysis) are not good criteria for construct validation with formative measures (MacKenzie, Podsakoff, & Jarvis, 2005).

Subsidiary knowledge stocks. The scales for subsidiary knowledge stocks (i.e. HC and SC) were also adapted from Youndt and Snell’s (2004) study. For HC, original five items were utilized. Youndt and Snell’s (2004) scale of SC does not distinguish between internal SC, external SC and intra-MNC SC. Therefore, we modified the original scale to examine these three types of SC. All items were rated using five-point Likert type scales ranging from 1 = “strongly disagree” to 5 = “strongly agree”. The list of knowledge stocks items utilized is provided in Appendix B.
We conducted exploratory factor analysis (EFA) on the 20 knowledge stocks items. The results from principal component analysis (PCA) with promax rotation on these items are provided in Table 1. The analysis yielded four factors with eigenvalues greater than 1.0, explaining 71.9% of total variance. An inspection of a scree plot also supported a four-factor solution. Items with factor loadings greater than .45 were included in the final scales as recommended by Tabachnick and Fidell (2007). Cronbach’s alpha coefficients exceeded .80 for all four knowledge stocks scales, indicating excellent internal consistency reliability.

--- Table 1 about here ---

**Knowledge transfer.** Subsidiary-to-HQ knowledge transfer was measured using Gupta and Govindarajan’s (2000) knowledge transfer scale items. Gupta and Govindarajan’s (2000) original scale had seven items; we re-worded the fourth item (product designs) as “product/service/program designs” in order to provide for responses from industries other than the manufacturing industry studied by Gupta and Govindarajan. We also added an eighth item, “know-how related to the market (e.g. customers, suppliers, competitors, regulations, etc.)”.

Consistent with Gupta and Govindarajan’s (2000) study, the respondents were asked to indicate on a 7-point Likert type scale ranging from 1=“not at all” to 7 = “to a large extent” for each of the eight items in respect to the extent to which the subsidiary provides knowledge and skills to HQ.

Although Gupta and Govindarajan’s (2000) scale has been widely used in knowledge transfer research (e.g. Minbaeva, 2007), extant literature does not provide evidence of scale validation. Therefore, we conducted EFA on the eight knowledge transfer items. Results from PCA with promax rotation are presented in Table 2. Contrary to expectation, the eight items loaded onto two factors instead of one, with eigenvalues greater than 1.0, explaining 71.2% of total variance. Inspection of the scree plot also supported a two-factor solution.

--- Table 2 about here ---
Items 3, 4, 5, and 6 focus on products and services that are developed and accumulated within a firm. We labeled this type of knowledge as “internal knowledge”, which is consistent with terminology previously utilized by Foss and Pedersen (2002). Items 1, 2, 7, and 8 primarily focus on provision processes or marketing of products and services developed and accumulated through different external relationships, particularly with customers. We labeled this type of knowledge as “network knowledge”, which is also consistent with Foss and Pedersen’s (2002) terminology. Cronbach’s alphas exceeded .80 for both knowledge transfer scales, indicating excellent internal consistency reliability.

**Discriminant validity.** Discriminant validity of all latent variables in this study was further established by confirmatory factor analysis (CFA) using structural equation modeling (SEM). As recommended by Coffman and MacCallum (2005), we used parcels instead of individual items as indicators of latent variables in order to overcome the relatively small sample size. Parcels generally have higher reliability than individual items (Kline, 2005) and overall fit of data to a model tends to be better for parceled models compared to those using items (Bandalos, 2002). In CFAs, items of endogenous latent variables (i.e. HC, internal SC, external SC, intra-MNC SC, transfer of internal knowledge, and transfer of network knowledge) were aggregated to three parcels each. The items for HR configurations were aggregated to one measured variable each, as they were treated as indices rather than reflective measures (DeVellis, 2003).

We expected that the full measurement model would consist of 10 distinct latent variables: (1) Acquisition configuration, (2) Developmental configuration, (3) Collaboration configuration, (4) Egalitarian configuration, (5) HC, (6) internal SC, (7) external SC, (8) intra-MNC SC, (9) transfer of internal knowledge, and (10) transfer of network knowledge. The hypothesized 10-factor model had acceptable level of fit to the data; \( \chi^2 (df=168) = 212.83; \) RMSEA = .04; 90% confidence interval for RMSEA: .021 to .059; CFI = .98; and TLI = .97 (see
Table 3). All standardized factor loadings were acceptable; ranging from .66 to .95. Correlations between the latent variables averaged .38, ranging between .12 and .73. These values are below the .85 threshold used by Kline (2005) to test for discriminant validity. Two other models were tested and compared against the 10-factor model: (a) the five-factor model with four latent factors of HR configurations and one latent factor of HC, internal SC, external SC, intra-MNC SC, and transfer of internal and network knowledge combined; and (b) the three-factor model with two latent factors of knowledge transfer and one latent factor of HR configurations, HC, internal SC, external SC, and intra-MNC SC combined. The results of chi-square difference test (Kline, 2005) indicated that the fit of the five-factor and the three-factor models were significantly worse compared to the 10-factor model (see Table 3). In sum, the results supported the construct validity of the hypothesized 10-factor measurement model and indicated the discriminant validity of the constructs under study.

--- Table 3 about here ---

Common method variance. Although we believe subsidiary senior executives are the best informant of both subsidiaries’ HRM and knowledge, the use of a single respondent design may expose the study to common method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Method variance is known to inflate the statistical associations between the two measures (Williams & Brown, 1994) and thus needs to be checked. We first tried controlling for the effects of an unmeasured latent methods factor (Podsakoff et al., 2003), but this method yielded a highly parameterized model with unstable estimates and was not suitable given the relatively small sample. Thus, we conducted Harman’s single-factor test (Podsakoff et al., 2003). If method variance were a serious problem in the study, a single factor should emerge from the EFA or one general factor account for most of the covariance of dependent and independent variables of the study (Podsakoff & Organ, 1986). An EFA using PCA was performed on all 53 items, extracting
14 factors with eigenvalues greater than 1.0. No general factor was evident in the un-rotated factor structure, with the first factor accounting for only 25.3% of the variance. Accordingly, method variance was not likely to be a major problem for this study.

Control variables. Subsidiary age, subsidiary size, entry mode, operation type, country-of-origin, and industry type were measured as control variables. Both the subsidiary age and the size were log transformed due to severe positive skewness. Entry mode was coded as 1 = greenfield operation and 0 = others (i.e. acquired and joint venture subsidiaries). Subsidiary operation type was coded as 1 = production and 0 = others (i.e. sales and marketing, and research and development). Country-of-origin was coded as two dummy variables; the omitted category was the US. Industry type was also coded as two dummy variables; the omitted category was the tertiary or service industry.

RESULTS

Table 4 presents means, standard deviations, and inter-correlations. Zero-order correlations among the HR configurations, HC, internal SC, external SC, and intra-MNC SC were acceptable with r values under .70, a point of reference where multicollinearity is likely to become a concern (Tabachnick & Fidell, 2007). Among eight control variables, the two country-of-origin dummies had statistically significant associations with most of the variables. Because country-of-origin may affect HR practices of MNC subsidiaries, these dummies were included in subsequent analyses. Although subsidiary size had a statistically significant correlation with transfer of internal knowledge, we did not include this variable in the analysis as the effect size was relatively small (i.e. r = .15). The subsidiary operation dummy had statistically significant correlations with HC and with intra-MNC SC. However, this variable was also excluded from our analysis as the effect sizes were relatively smaller (i.e. r = .21 and .20 respectively) compared to those of country-of-origin dummies (see Table 1).
Our hypotheses were tested using SEM. Full information maximum likelihood was utilized to estimate the models in the presence of missing data (Enders & Bandalos, 2001). Figure 3 shows our structural model and its standardized path coefficients of the relationships between HR configurations, knowledge stocks, and the knowledge transfer from a subsidiary to its HQ. For ease of presentation, the control variables are omitted from Figure 3. The fit indices of the structural model had an acceptable fit to the data; $\chi^2 (df = 225) = 350.99$; RMSEA = .06; 90% confidence interval for RMSEA: .048 to .073; CFI = .94; and TLI = .92.

First, our model investigated relationships between HR configurations and knowledge stocks (HC and SC). We found no statistically significant association between the Acquisition configuration and HC, so Hypothesis 1 was not supported. There was a positive association between the Developmental configuration and HC ($\beta = .43, p < .01$), supporting Hypothesis 2. Hypotheses 3a, b, and c were all supported, as we found positive associations, respectively, between the Collaboration configuration and internal SC ($\beta = .46, p < .01$), external SC ($\beta = .40, p < .01$), and intra-MNC SC ($\beta = .51, p < .01$). As we found no statistically significant association between the Egalitarian configuration and internal SC, Hypothesis 4 was not supported.

Second, our model investigated the associations between knowledge stocks (HC and SC) and knowledge transfer (transfer of internal and network knowledge). We found no statistically significant association between HC and transfer of internal or network knowledge, so Hypothesis 5 was not supported. With regard to the three types of SC, we found little evidence of associations with knowledge transfer. Hypothesis 6 was not supported although the association between internal SC and transfer of network knowledge approached statistical significance at $p < .05$ level (with absolute $p$ value of .054, $\beta = .25$). External SC and the transfer of network
knowledge were not significantly related. However, there was a positive association between external SC and the transfer of internal knowledge ($\beta = .30, p < .05$); thus Hypothesis 7 was partially supported. No statistically significant association was found between intra-MNC SC and transfer of internal or network knowledge, so Hypothesis 8 was not supported.

**DISCUSSION**

By applying the concepts of HC and SC, and bridging the literature on HRM and international knowledge transfer, this study contributes valuable insights to the association between subsidiary HR practices, knowledge stocks, and subsidiary-to-HQ knowledge transfer. According to our SEM results, the HR configurations vary with respect to their relationships with knowledge stocks. The Collaboration configuration appears to be an effective HR system for MNCs seeking to develop SC of subsidiaries. Our findings suggest that an HR configuration including a set of HR practices that emphasize teamwork (Youndt & Snell, 2004) will play an important role in building knowledge resources available through the relationships between subsidiary employees and people from HQ and/or other subsidiaries of the same MNC. This configuration seems also useful for building relationships between subsidiary employees and their co-workers in the subsidiary as well as their stakeholders external to the MNC.

Consistent with Youndt and Snell (2004), we also found that an HR configuration, with an emphasis on training and development, is positively related to HC, supporting the assumptions of HC theory (Becker, 1975). This finding suggests that subsidiaries which conduct more training and development, and which provide other HR practices such as performance appraisals and promotions so as to complement training and development, are more likely to retain employees with higher levels of HC.

The lack of support for a hypothesized association between the Acquisition configuration and HC was interesting. Further, the failure to find an association between the Egalitarian
configuration and internal SC was counter to our expectations. While our findings on the associations between the Collaboration, Developmental, and Egalitarian configurations and HC or SC are largely consistent with Youndt and Snell’s (2004) findings, we found no evidence of associations between the Acquisition configuration and knowledge stocks. This is in contrast with Youndt and Snell’s (2004) finding of a positive association between the Acquisition configuration and HC. There are some possible explanations for this inconsistency. First, it may be due to sample differences between the two studies. Youndt and Snell’s (2004) study was based on large firms with at least 100 employees, whereas about 75% of our sample consisted of small subsidiaries with fewer than 100 employees. Smaller firms may not have the same capacity for conducting thorough and comprehensive hiring processes compared to larger firms, due partly to costs. Second, the Australian labor market is experiencing serious skill shortages (Holland, Sheehan, & De Cieri, 2007). Under the circumstances, firms may utilize various other recruitment methods, such as head-hunting or network-based hiring, to attract human resources.

Third, we note that both Acquisition and Egalitarian configurations have limited coverage of HR practices, when compared to the Collaboration or Developmental configurations. The Acquisition configuration focuses mainly on hiring and remuneration practices, while the Egalitarian configuration focuses on hierarchy (or absence of it). An explanation for the lack of association between these HR configurations and knowledge stocks may be found in research on the HR-firm performance link. This body of research has shown that incomplete sets of HR practices will not, by themselves, contribute to firm performance. Reviews of the HR-firm performance research (Boselie, Dietz, & Boon, 2005; Wright, Gardner, Moynihan, & Allen, 2005) have noted that there is no consensus on the HR practices to be included in an HR system. Research has continued to emphasize the value that can be added when there is consistency, complementarity or connection between HRM areas and the problem that can occur when this is
not the case (Bowen & Ostroff, 2004). Drawing on this body of research, we conclude that a comprehensive HR configuration is required, in order to make an important contribution to other organizational areas, such as knowledge stocks or firm performance.

We also explored associations between knowledge stocks and knowledge transfer. Using Gupta and Govindarajan’s (2000) scale, we identified two types of knowledge transfer, which we named transfer of internal knowledge and transfer of network knowledge; previous research had assumed only one. Although this is a ‘popular’ scale within the knowledge transfer literature, it appears to require refinement as a measure of knowledge transfer.

External SC (knowledge resources deriving from relationships between a subsidiary and its external stakeholders) predicted transfer of internal knowledge from the subsidiary to HQ, supporting the assumption of structural holes as a source of competitive advantage (Burt, 1992). This indicates that subsidiaries holding ties with various external stakeholders are active in sending knowledge related to packaging design/technology, product/service/program designs, process designs, and purchasing know-how to their HQ. Subsidiaries that have higher levels of external SC may be good at understanding and reflecting the needs of their customers. Suppliers and alliance partners are said to contribute to improving products/services of firms (Dyer & Nobeoka, 2000), and therefore, may be able to accumulate strategic business knowledge between them and subsidiaries so that subsidiaries are capable of sending the knowledge to HQ. For MNCs seeking to maximize the knowledge intensity with external stakeholders, our finding suggests that subsidiaries can be an important conduit to HQ. Further, we draw attention again to our finding that the Collaboration HR configuration is a predictor of subsidiary external SC. The subsidiary’s HR system is therefore crucial, not only for effective management of local operations, but also for HQ’s knowledge acquisition.

Contrary to previous research on international knowledge transfer, we found no other
evidence of associations between knowledge stocks and knowledge transfer from subsidiary to HQ. Many of the Australian subsidiaries participating in our study engaged in more standardized operations, such as sales, servicing and maintenance, rather than more innovative activities, such as research and development. Sales subsidiaries are likely to possess extant knowledge of customers and their needs, and henceforth have higher levels of external SC. However, these subsidiaries may be less likely to be capable of providing new internally-created knowledge.

In sum, our findings have contributed to the understanding of the role of HRM in development of knowledge stocks, which leads to knowledge transfer from a subsidiary to HQ.

**Limitations and Issues for Future Research**

We acknowledge several limitations of this research. A first limitation is that we gathered data from a single respondent in each firm. Although our respondents were the most appropriate informants for this study and method biases were also not evident from Harman’s test, we cannot completely rule out the possibility of biases. The biases may have inflated our results. Although it was not feasible for this survey, potential method biases could be addressed a priori by obtaining measures of the variables from different sources. Separating the measures of variables would restrict the potential impact of respondents’ embedded theories or ‘mind sets’ that affect the observed relationship (Podsakoff et al., 2003). For example, data on knowledge transfer could be gathered using objective firm records, rather than perceptual reports from informants. However, construction of objective measures of knowledge transfer, in particular tacit knowledge, could be difficult because tacit knowledge leaves only partial objective sketches measureable by an external researcher and occurs longitudinally (Gupta & Govindarajan, 2000). In addition, obtaining two or more informants per firm are ways to decrease measurement error (Gerhart, Wright, McMahan, & Snell, 2000).

Second, the analysis of SC and the network structure in particular requires consideration
of the quality of the relationships such as frequency and intensity and the arrangement of the network (Adler & Kwon, 2002). Our study examined senior executives’ perceptions about the arrangement of the network by asking about the level of interaction in three types of network structure (i.e. internal, external, and intra-MNC). We did not ask about frequency and intensity of interaction. This is because we were more interested in knowing senior executives’ perceptions about constructs under study rather than the actual frequency and intensity of the interaction. However, it is acknowledged that these are important elements of social network research and future research might take this issue into account. Another limitation associated with network analysis in relation to method biases lies in examining the dyadic relationship between a subsidiary and its stakeholders. A research design with data collection from a subsidiary as well as HQ and external stakeholders will likely strengthen a study. Studies on network analysis (see for example, Hansen, 1999), which collect data from participants of a network on both ends of a dyadic relationship, would provide a good approach to data collection for future research.

Third, we focused on knowledge stocks (HC and SC) as antecedents of knowledge transfer. Although motivational aspects of a knowledge sender (a subsidiary) were beyond the scope of this study, this may be a worthwhile area for future research. It has been argued that the motivational disposition of a knowledge sender, together with the sender’s ability, is an important antecedent of knowledge transfer (Minbaeva, 2007; Minbaeva & Michailova, 2004). A low level of a knowledge recipient’s motivation associated with ‘hostile’ attitudes towards unfamiliar knowledge coming from a knowledge sender is said to hinder the transfer process (Husted & Michailova, 2002). A low level of a knowledge sender’s motivation, described as “knowledge hoarding”, or being too precious about the knowledge to be transferred to another unit, is also said to become an obstacle to the transfer process (Husted & Michailova, 2002).

Fourth, no causal inferences concerning the association between HRM, knowledge
stocks, and knowledge transfer can be made, as our data are cross-sectional. Use of a longitudinal or experimental design in future research would strengthen causal inferences.

Finally, we note that recent empirical research has examined the interaction between three sub-sets of intellectual capital (i.e. HC, SC, and organizational capital) (Reed, Lubatkin, & Srinivasan, 2006; Subramaniam & Youndt, 2005). There may be interaction effects between HC and SC measures and between different HR configuration measures. While this was beyond the scope of the current study, future studies may seek to take this point into consideration.

CONCLUSION

This research is significant in being one of the first empirical investigations to bring together the HRM and international knowledge transfer literature to examine the role of a subsidiary’s HR practices in the development of a subsidiary’s knowledge stocks (i.e. HC and SC), leading to subsidiary-to-HQ knowledge transfer. We argue that subsidiaries’ HR configurations are one of the antecedents of subsidiaries’ knowledge stocks (HC and SC); further, we show that HR configurations are conducive to building HC and SC. Moreover, subsidiaries with an HR configuration emphasizing training, development and career development will likely retain employees with higher levels of HC, supporting HC theory. We also found that an HR configuration emphasizing teamwork will play a vital role in building subsidiary’s SC, supporting the view that HRM is an antecedent of SC. Our findings also indicate that a subsidiary’s external SC is associated with transfer of internal knowledge from subsidiaries to HQ. This supports the assumption of structural holes as a source of competitive advantage (Burt, 1992). We also suggest that a subsidiary’s HR practices that encourage teamwork have a role to play in building ties between subsidiary employees and external stakeholders so as to accumulate strategic business knowledge. Hence, the effectiveness of a subsidiary’s HR practices is vital for managing subsidiary employees and for assisting the HQ to obtain strategically important knowledge.
References


# APPENDIX A

## The List of Human Resource Configuration Items

<table>
<thead>
<tr>
<th>Items</th>
<th>Acquisition</th>
<th>Development</th>
<th>Collaboration</th>
<th>Egalitarian</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) Our hiring process is thorough and comprehensive.</td>
<td>(1) Our training and development activities are comprehensive.</td>
<td>(1) Interpersonal skill is one criterion that we use to select job candidates.</td>
<td>(1) We try to eliminate and minimise status symbols (e.g. executive dining rooms, parking spaces and corner offices).</td>
</tr>
<tr>
<td></td>
<td>(2) We screen many applicants to fill job openings.</td>
<td>(2) We spend more money per employee on training than our competitors.</td>
<td>(2) Ability to collaborate and work in teams is one criterion that we use to select job candidates.</td>
<td>(2) Our organisational structure minimises the number of hierarchical levels.</td>
</tr>
<tr>
<td></td>
<td>(3) We use many different recruiting sources.</td>
<td>(3) Our employees spend more hours per year training than employees of our competitors.</td>
<td>(3) Our training and development programs incorporate team building.</td>
<td>(3) Our jobs encourage empowerment and participation.</td>
</tr>
<tr>
<td></td>
<td>(4) We pay higher wages than our competitors.</td>
<td>(4) We provide continuous developmental opportunities for our employees.</td>
<td>(4) Our performance appraisal system uses multiple inputs (e.g. peers, customers, subordinates, etc.).</td>
<td>(4) We have few job classifications.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(5) We offer many different types of training programs.</td>
<td></td>
<td>(5) We have a narrow range of pay grades.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(6) Our performance appraisal process tolerates mistakes that are non-repetitive.</td>
<td></td>
<td>(6) We have a grievance system for employees voicing their concerns (e.g. unions, work council, employee suggestion programmes).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7) Our employees receive a lot of developmental feedback.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(8) We try to promote from within the subsidiary.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(9) Our employees are rewarded for their knowledge/skill development.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note.** Modifications and new items are highlighted in bold.
APPENDIX B

The List of Subsidiary Human and Social Capital Items

<table>
<thead>
<tr>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Human capital</strong></td>
</tr>
<tr>
<td>(1) Our employees are highly skilled.</td>
</tr>
<tr>
<td>(2) Our employees are widely considered the best in our industry.</td>
</tr>
<tr>
<td>(3) Our employees are creative and bright</td>
</tr>
<tr>
<td>(4) Our employees are experts in their particular jobs and functions</td>
</tr>
<tr>
<td>(5) Our employees develop new ideas and knowledge.</td>
</tr>
<tr>
<td><strong>Internal social capital</strong></td>
</tr>
<tr>
<td>(1) Our employees are skilled at collaborating with each other to diagnose and solve problems <strong>within our subsidiary</strong>.</td>
</tr>
<tr>
<td>(2) Our employees share information and learn from one another <strong>within our subsidiary</strong>.</td>
</tr>
<tr>
<td>(3) Our employees interact and exchange ideas with people from different areas of <strong>our subsidiary</strong>.</td>
</tr>
<tr>
<td>(4) Our employees apply knowledge from one area of <strong>our subsidiary</strong> to problems and opportunities that arise in another <strong>area</strong>.</td>
</tr>
<tr>
<td>(5) Our employees partner with <strong>their colleagues to develop solutions within our subsidiary</strong>.</td>
</tr>
<tr>
<td><strong>External social capital</strong></td>
</tr>
<tr>
<td>(1) Our employees are skilled at collaborating with <strong>customers, suppliers, or alliance partners, etc.</strong> to diagnose and solve problems.</td>
</tr>
<tr>
<td>(2) Our employees share information and learn from each other with <strong>customers, suppliers, or alliance partners, etc.</strong></td>
</tr>
<tr>
<td>(3) Our employees interact and exchange ideas with <strong>customers, suppliers, or alliance partners, etc.</strong></td>
</tr>
<tr>
<td>(4) Our employees apply knowledge from <strong>customers, suppliers, or alliance partners, etc.</strong> to problems and opportunities that arise in <strong>our subsidiary</strong>.</td>
</tr>
<tr>
<td>(5) Our employees partner with <strong>customers, suppliers, or alliance partners, etc.</strong> to develop solutions.</td>
</tr>
<tr>
<td><strong>Intra-MNC social capital</strong></td>
</tr>
<tr>
<td>(1) Our employees are skilled at collaborating with <strong>people from our headquarters and/or other subsidiaries</strong> to diagnose and solve problems.</td>
</tr>
<tr>
<td>(2) Our employees share information with, and learn from, <strong>people from our headquarters and/or other subsidiaries</strong>.</td>
</tr>
<tr>
<td>(3) Our employees interact and exchange ideas with <strong>people from our headquarters and/or other subsidiaries</strong>.</td>
</tr>
<tr>
<td>(4) Our employees apply knowledge from <strong>our headquarters and/or other subsidiaries</strong> to problems and opportunities that arise in <strong>our subsidiary</strong>.</td>
</tr>
<tr>
<td>(5) Our employees partner with <strong>people from our headquarters and/or other subsidiaries</strong> to develop solutions.</td>
</tr>
</tbody>
</table>

Note. Modifications are highlighted in bold.
Table 1  Principal Component Analysis of Knowledge Stock Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>External SC</td>
<td>Intra-MNC SC</td>
<td>HC</td>
<td>Internal SC</td>
</tr>
<tr>
<td>External SC 5</td>
<td>.91</td>
<td>.02</td>
<td>-.07</td>
<td>-.03</td>
</tr>
<tr>
<td>External SC 3</td>
<td>.90</td>
<td>.09</td>
<td>-.02</td>
<td>-.08</td>
</tr>
<tr>
<td>External SC 2</td>
<td>.88</td>
<td>.02</td>
<td>.01</td>
<td>.01</td>
</tr>
<tr>
<td>External SC 4</td>
<td>.77</td>
<td>-.13</td>
<td>.05</td>
<td>.15</td>
</tr>
<tr>
<td>External SC 1</td>
<td>.72</td>
<td>.03</td>
<td>.17</td>
<td>.02</td>
</tr>
<tr>
<td>Intra-MNC SC 3</td>
<td>-.09</td>
<td>.95</td>
<td>-.02</td>
<td>.02</td>
</tr>
<tr>
<td>Intra-MNC SC 2</td>
<td>.01</td>
<td>.94</td>
<td>-.11</td>
<td>.06</td>
</tr>
<tr>
<td>Intra-MNC SC 5</td>
<td>.14</td>
<td>.86</td>
<td>.06</td>
<td>-.15</td>
</tr>
<tr>
<td>Intra-MNC SC 1</td>
<td>-.05</td>
<td>.82</td>
<td>.06</td>
<td>.04</td>
</tr>
<tr>
<td>Intra-MNC SC 4</td>
<td>.07</td>
<td>.75</td>
<td>.05</td>
<td>.07</td>
</tr>
<tr>
<td>HC 2</td>
<td>.05</td>
<td>.04</td>
<td>.85</td>
<td>.11</td>
</tr>
<tr>
<td>HC 4</td>
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<td>.04</td>
<td>.93</td>
<td>-.24</td>
</tr>
<tr>
<td>HC 1</td>
<td>.08</td>
<td>.01</td>
<td>.83</td>
<td>-.07</td>
</tr>
<tr>
<td>HC 3</td>
<td>.13</td>
<td>-.03</td>
<td>.72</td>
<td>.13</td>
</tr>
<tr>
<td>HC 5</td>
<td>.04</td>
<td>-.05</td>
<td>.50</td>
<td>.37</td>
</tr>
<tr>
<td>Internal SC 2</td>
<td>-.11</td>
<td>-.01</td>
<td>-.07</td>
<td>.95</td>
</tr>
<tr>
<td>Internal SC 5</td>
<td>.23</td>
<td>-.05</td>
<td>-.18</td>
<td>.77</td>
</tr>
<tr>
<td>Internal SC 3</td>
<td>-.20</td>
<td>.18</td>
<td>.16</td>
<td>.67</td>
</tr>
<tr>
<td>Internal SC 1</td>
<td>.05</td>
<td>-.06</td>
<td>.24</td>
<td>.65</td>
</tr>
<tr>
<td>Internal SC 4</td>
<td>.24</td>
<td>.09</td>
<td>-.13</td>
<td>.62</td>
</tr>
</tbody>
</table>

| Eigenvalues        | 9.16  | 2.25  | 1.74  | 1.22  |
| Cumulative percent of variance explained | 45.86 | 57.11 | 65.80 | 71.90 |
| Cronbach’s alpha   | .92   | .93   | .88   | .84   |

Note. N = 151. Promax rotation. Pattern coefficients reported. Bold indicates factors included in final scale. See Appendix B for the full description of each item.
Table 2  Principal Component Analysis of Knowledge Transfer Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Internal knowledge</td>
<td>Network knowledge</td>
</tr>
<tr>
<td>(5) Process designs</td>
<td>.96</td>
<td>-.13</td>
</tr>
<tr>
<td>(3) Packaging design/technology</td>
<td>.87</td>
<td>-.10</td>
</tr>
<tr>
<td>(4) Product/service/program designs</td>
<td>.75</td>
<td>.15</td>
</tr>
<tr>
<td>(6) Purchasing know-how</td>
<td>.74</td>
<td>.13</td>
</tr>
<tr>
<td>(8) Know-how related to the market (e.g. customers, suppliers, competitors, regulations, etc.)</td>
<td>-.18</td>
<td>.92</td>
</tr>
<tr>
<td>(1) Marketing know-how</td>
<td>-.01</td>
<td>.90</td>
</tr>
<tr>
<td>(2) Distribution know-how</td>
<td>.13</td>
<td>.77</td>
</tr>
<tr>
<td>(7) Management systems and practices</td>
<td>.33</td>
<td>.54</td>
</tr>
</tbody>
</table>

Eigenvalues
Cumulative percent of variance explained
Cronbach’s alpha

<table>
<thead>
<tr>
<th>Model</th>
<th>df</th>
<th>$\chi^2$</th>
<th>$\chi^2$/df</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA</th>
<th>$\Delta \chi^2$ test</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-factor</td>
<td>206</td>
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Figure 1  Conceptual Framework

Subsidiary’s HR configurations

Subsidiary’s knowledge stock

Human capital

Social capital

Knowledge transfer
Figure 2 Hypothesized Model

- Subsidiary’s HR configurations
  - Acquisition
  - Developmental
  - Collaboration
  - Egalitarian

- Subsidiary’s knowledge stock
  - Human capital
  - Internal social capital
  - External social capital
  - Intra-MNC social capital

- Knowledge transfer

- Hypotheses:
  - $H_1$
  - $H_2$
  - $H_3a$
  - $H_3b$
  - $H_3c$
  - $H_4$
  - $H_5$
  - $H_6$
  - $H_7$
  - $H_8$
* p < .05; ** p < .01. N = 151.