Knowledge sharing between MNC units: A social capital perspective

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ABSTRACT
This paper explores the influence of social capital levels and communication on in- and outward knowledge sharing in relationships between foreign-owned subsidiaries and their sister and parent units. The study is based on data from 298 dyadic relationships between MNC subsidiaries in Finland and China and their intra-MNC sister and parent units. This data permits examination of differences in knowledge sharing patterns across both hierarchical levels, cultural distance, and socioeconomic context, with a stronger claim to cross-border applicability than most previous studies. This study thus brings an important contribution to the MNC literature by providing a comprehensive, empirically well grounded picture of the antecedents of interunit knowledge sharing at the dyad level. Our results strongly underline the importance of the social dimensions of interunit knowledge sharing relationships. The implications of these findings are discussed and avenues for future research suggested.

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International management research has increasingly moved towards viewing the multinational corporation (MNC) as an interorganizational network of geographically dispersed and differentiated units (Hedlund, 1986; Bartlett and Ghoshal, 1989; Ghoshal and Bartlett, 1990), whose *raison d'être* lies in the ability to exploit resources – especially knowledge – more efficiently internally than would be possible through external market mechanisms (Kogut and Zander 1995). This view emphasizes that MNCs' competitive advantage is fundamentally based on how efficiently they share knowledge across units (Porter, 1986; Winter, 1987; Gupta and Govindarajan, 1991; 2000; Grant, 1996; Doz et al., 2001). Understanding how to optimize this process is thus a matter of central interest for scholars and practitioners alike.

In exploring this issue, the potentially significant role of MNC subsidiaries has been increasingly acknowledged (Birkinshaw and Hood 1998, Holm and Pedersen 2000). Subsidiaries have been found important not only as receivers of knowledge, but also as providers of it to other corporate units. Research in this vein has explored characteristics of different subsidiary roles (e.g. White & Poynter, 1984; Bartlett & Ghoshal, 1986, 1989; Hedlund & Rolander, 1990; Jarillo & Martinez, 1990; Gupta & Govindarajan, 1991; Taggart & Hood, 1998), as well as some aspects of subsidiary resources (Etemad & Dulude, 1986; Birkinshaw & Hood, 1998). A range of barriers to knowledge transfer has also been uncovered (Szulanski, 1996; Lane and Lubatkin, 1998; Gupta and Govindarajan, 2000).

In addition to factors related to the type of knowledge involved, barriers to transfer include motivational factors associated with both the sending and the receiving unit (Szulanski, 1996; Forsgren, 1997; Gupta and Govindarajan, 2000), indicating that cooperative and cohesive behavior of foreign subsidiaries involved in interunit resource transfers is crucial for the effective functioning of an MNC. For such behavior, in turn, normative integration has forcefully been argued to be an important prerequisite (Hedlund, 1986; Barlett and Ghoshal 1987, Prahalad and Doz 1987, Martinez and Jarillo 1989, Nohria and Ghoshal, 1994). Quick and effective sharing of knowledge across units can be significantly facilitated if units share visions, values, norms, and beliefs since, in the words of Bresman et al. (1999:442), 'individuals will only participate willingly in knowledge exchange once they share a sense of identity or belonging with their colleagues'. Similar ideas are found already in the writings of

e.g. Durkheim (1933), Etzioni (1961) or Selznick (1965), but we contend that they still have not been exploited to their full potential when it comes to understanding knowledge sharing in MNCs. Indeed, a number of gaps remain in our understanding of this phenomenon.

Firstly, international business research has historically tended to focus on concrete mechanisms of normative integration, such as employee transfers, international training programs and project teams, and scheduled meetings of managers from different international locations (Martinez and Jarillo, 1989; O'Donnell, 2000). While the impact of such mechanisms on knowledge sharing is undoubtedly strong, recent research on social capital (Nahapiet and Ghoshal 1998, Tsai and Ghoshal 1998) has suggested two other factors – shared vision and trust – which may also strongly influence the extent to which interunit knowledge sharing occurs. We argue that these dimensions of interunit relationships, although overlapping with the existence of normative integration mechanisms, deserve explicit attention in their own right.

Previous research also highlights another factor with a potentially powerful impact on interunit knowledge sharing, namely interunit communication (Ghoshal and Bartlett, 1988; Ghoshal et al. 1994; Gupta and Govindarajan 2000). Gupta and Govindarajan (2000) recently provided empirical evidence of the importance of communication in interunit knowledge sharing. However, these findings have not yet been reflected in the amount of research on this subject. This constitutes an important research gap.

A third issue centers on variation in in- and outward knowledge sharing patterns. Previous research shows that MNC subsidiaries are characterized by knowledge flows of varying intensity, some subsidiaries ('global players' in Gupta and Govindarajan's (1991) classification) scoring high on both in- and outward flows etc. However, this observation has as yet mostly been used for classification purposes. With a few exceptions, such as Gupta and Govindarajan (2000), there is little research on what may arguably be more relevant from a practical point of view, namely how and why such flows vary across individual subsidiaries' dyadic relationships to specific knowledge sharing partners.

A fourth and final question concerns the applicability of traditionally Western-focused international business research to other cultural contexts. As pointed out already some 20 years ago by Boyacigiller and Adler (1984), there are considerable problems associated with generalizing to a global population of MNCs based on research mainly grounded in Western, particularly Anglo-Saxon contexts. We argue that MNC research has not always risen to the challenges posed by this observation.

Following from the above, the aim of the present paper is to examine the influence of social capital levels and communication on in- and outward knowledge sharing in dyadic relationships between foreign-owned subsidiaries and their sister and parent units across two different social, economic, and cultural contexts. To accomplish this aim, we use data from an extensive database charting the knowledge sharing relationships between foreign-owned subsidiaries in Finland and the People's Republic of China (PRC) and their intra-MNC sister and parent units. The study is based on data from 298 such dyads, 164 with a Finnish counterpart and 134 with a Chinese one, collected in 2000-2002 from the presidents of the focal subsidiaries. Not only does this data permit examination of differences in knowledge sharing patterns across both hierarchical levels (i.e., between subsidiaries and HQs as well as between sister subsidiaries), cultural distance, and socioeconomic context; the use of similarly sized samples drawn from a small, highly industrialized Western country and a large, developing Asian country also endows our findings with a stronger claim to cross-border applicability than most previous studies in the field.

This study thus brings an important and timely contribution to the MNC literature by providing a comprehensive, empirically well grounded picture of the antecedents of interunit knowledge sharing at the dyad level. Our extensive database allows us to assess the relative importance of a large number of variables brought up by previous research as potentially relevant for interunit knowledge sharing. It is therefore doubly notable how strongly our results underline the importance of the social dimensions of interunit knowledge sharing relationships, relative to the structural dimensions of these relationships often emphasized in previous research. The implications of these findings are discussed and avenues for future research are suggested.

LITERATURE REVIEW

Social capital. Nahapiet and Ghoshal (1997: 243) define social capital as 'the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit'. They distinguish between three interrelated, overlapping, but different dimensions of social capital: the structural, the relational, and the cognitive. The structural dimension is mainly concerned with the impersonal linkages between people or units, such as e.g. the existence of network ties between actors; the pattern of ties in terms of e.g. density, connectivity, or hierarchy; and the existence of networks created for one purpose that may be used for another ('appropriable organzation'). This dimension corresponds to issues more commonly treated in MNC research under the heading of normative integration mechanisms. By contrast, the relational dimension focuses on those personal relationships, friendships, and relations of mutual respect individuals have developed through a history of interactions, and so includes such concepts as trust and trustworthiness, norms and sanctions, obligations and expectations, and identity and identification. Finally, the cognitive dimension encompasses organizational phenomena such as shared representations, interpretations, language, codes, narratives, and systems of meaning among parties. Nahapiet and Ghoshal (1997: 260) suggest that performance differences between firms 'may represent differences in their ability to create and exploit social capital.'

Tsai and Ghoshal (1998) provided the first empirical application of the social capital concept to the MNC context. They termed the structural dimension *social interaction*, the cognitive dimension *shared vision*, and the relational dimension *trust* – a terminology henceforth used also in this paper – and examined relationships between these dimensions of social capital and the patterns of resource exchange and combination inside 15 units of a large MNC. Their results indicated that higher levels of social capital indeed do facilitate the exchange and combination of resources, including knowledge, within MNCs.

It should be noted that there is considerable overlap between the three dimensions of social capital, sometimes making them difficult to separate empirically. Drawing on the research by Nahapiet and Ghoshal (1998) and Tsai and Ghoshal (1998), we nevertheless argue that they are sufficiently distinct to be treated as separate variables.

It should also be noted that, again following Tsai and Ghoshal (1998: 470), resource exchange and resource combination are discussed as one concept in this study since 'the resource combination process often takes place in conjunction with resource exchange'.

Social interaction. Social interaction, or the structural dimension of social capital, corresponds to what in international business research is usually termed normative integration mechanisms. Intra-MNC integration mechanisms can broadly be split in two groups – bureaucratic or formal ones, and normative or informal ones (Martinez and Jarillo, 1989) – and traditionally MNCs have primarily promoted integration by employing the former. Bureaucratic mechanisms are considered to play an important role in MNC management, constituting the necessary foundation for controlling and coordinating operations. However, indications are that they tend to become insufficient as means of control and coordination as the MNC grows larger and more complex (Martinez and Jarillo, 1989), and therefore they are increasingly complemented (although not replaced) by informal mechanisms aiming at increasing normative integration, such as personnel rotation (Edström and Galbraith 1977), short-term visits, participation in joint training programs and meetings, and membership in cross-unit teams, task forces and committees (O'Donnell, 2000).

Through the use of informal integration mechanisms between headquarters and foreign subsidiaries as well as between subsidiaries, individuals are likely to develop open and positive attitudes towards other nationalities and cultures (Edström and Galbraith 1977). Informal integration mechanisms are also likely to contribute to increased interunit trust and joint vision and objectives. Given indications in previous research that the creation and transfer of knowledge within the MNC builds on a dense network of lateral and horizontal relationships between units (Gupta & Govindarajan, 1991; Kogut & Zander, 1993) and individuals (Gupta et al., 1999; Tsai & Ghoshal, 1998), the following hypotheses are forwarded:

Hypothesis 1a: The greater the intensity of social interaction, the more outward knowledge sharing will there be.
Hypothesis 1b: The greater the intensity of social interaction, the more inward knowledge sharing will there be.

Shared vision. The aim of normative integration is for different MNC units to share a set of values, objectives and beliefs (Nohria and Ghoshal, 1994). To the extent that different units share long-term visions and goals, they are more likely to engage in transfer of resources and they are also more likely to exchange complementary knowledge needed to pursue their shared vision.

In order to achieve global strategic coordination and integration, the different units of an MNC in a global industry must develop a common view of strategy and competitive threats, as well as an ability to coordinate strategic missions. To this end, a common, uniting vision is needed. As Prahalad and Doz express it, 'strategic control [...] is dependent on having the key subsidiaries share *a common vision* with headquarters' (Prahalad and Doz 1987: 163, italics in original). Nurturing such a vision in all parts and at all levels of the MNC is thus seen as vitally important for strategic coordination and integration at the global level.

Discussing what they call the 'transnational' MNC, Bartlett and Ghoshal (1995) underline the importance of a common vision of the future and a shared set of values that can neutralize and focus managers' business, functional, or geographic objectives. They recommend top management to 'create a corporate lightning rod that captures this otherwise diffuse energy and channels it toward powering a single company engine', noting that a 'well-created and carefully articulated vision can become not only a beacon of strategic direction, but also an anchor of organizational stability' (Bartlett and Ghoshal, 1995: 678). Similarly, Hedlund and Kogut (1993) also propose that the internalization of views, values, and strategies can provide the organization with an "identity", i.e. a strong sense of a shared mission and a unitary corporate culture.

Therefore, the following hypotheses are forwarded:

Hypothesis 2a: The stronger the perception of a shared vision, the more outward knowledge sharing will there be.
Hypothesis 2b: The stronger the perception of a shared vision, the more inward knowledge sharing will there be.

Trust. Trust is also important to the success of MNCs in that it encourages cooperation and reduces unproductive conflict (Govindarajan and Gupta, 2001). The existence of a trustful relationship exists between the 'sender' and the 'receiver' of knowledge enhances intra-MNC knowledge transfer. Unless the knowledge source perceives the receiving unit as trustworthy, meaning for instance that the recipient is expected to reciprocate the resource transfer and/or that the receiver believe that the knowledge will not be used in ways which are detrimental to the sender, transfer is unlikely to take place (Szulanski, 1996).

Central to most conceptualizations of trust in the literature on intra- and interorganizational trust are the notions of risk and vulnerability (Mayer et al., 1995; Rousseau et al., 1998). In the absence of risk, trust is irrelevant because there is no vulnerability. In the context of MNCs, for example, a foreign subsidiary may perceive that it risks its future position in the corporation if it transfers unique knowledge to another MNC unit, thereby creating a situation where it no longer has a unique status within the MNC. A subsidiary may also perceive a risk that another MNC unit does not have the ability, integrity or benevolence (Mayer et al., 1995) to match its own contribution to a development project jointly undertaken by the two units. While the focal unit in the former example may jeopardize its future status and the influence it exerts within the MNC, in the latter case the subsidiary may find that the collaboration drains it of resources that (at least from its own point of view) could have been spent more productively on other issues.

Therefore, the following hypotheses are forwarded:

Hypothesis 3a: The stronger the perception of interunit trust, the more outward knowledge sharing will there be.
Hypothesis 3b: The stronger the perception of interunit trust, the more inward knowledge sharing will there be.

Communication. Extensive, open interunit communication is seen as crucial for the exchange of knowledge and expertise and the adoption and diffusion of innovation in the MNC's subsidiary network (Gupta and Govindarajan 1991; Ghoshal et al. 1994).

Bresman, Birkinshaw and Nobel (1999), in a study on international acquisitions, also found communication to positively impact knowledge transfer.

Interunit communication is commonly divided into 'face-to-face' or 'mediated' depending on whether media such as telephone, e-mail, intranet-based discussion groups, or video conferencing are used. Face-to-face communication is normally considered more efficient since it is the 'richest' form of communication in terms of verbal and visual cues (Daft and Lengel 1987). However, in MNCs, the costs of this type of communication tend to be very high both in human terms and in terms of time and money spent on interunit travel. Mediated communication is therefore becoming an increasingly important means of interunit interaction. (Fulk and DeSanctis 1995). Also, it may be argued that face-to-face communication forms part of the structural dimension of social capital as discussed above. Therefore we focus here on mediated communication.

The following hypotheses are forwarded:

Hypothesis 4a: The more mediated communication between the units, the more outward knowledge sharing will there be.
Hypothesis 4b: The more mediated communication between the units, the more inward knowledge sharing will there be.

Control variables

In addition to mediated communication and the three dimensions of social capital, some other factors may be associated with interunit knowledge sharing in MNCs. The following variables are employed as control variables in this study: the local embeddedness of the focal unit; the cultural distance, length of the relationship, and extent of functional integration between the focal unit and the unit with which it shares knowledge; and the size and nationality of their parent MNC. Where relevant, subsidiary home country is also used as a control.

Subsidiary embeddedness. Embeddedness can be defined as the closeness in a dyadic relationship, reflecting the intensity of information exchange and the degree of resource adaptation between parties (Andersson, Forsgren and Holm 1999) – thus

clearly affecting MNC subsidiaries' knowledge base. However, it is less clear how subsidiaries' local embeddedness relates to their knowledge sharing with other MNC units. On one hand, knowledge developed by subsidiaries in intensive co-operation with local customers and suppliers may be valuable for other corporate units, and it has been shown that subsidiaries' corporate role tends to increase in importance as their degree of external embeddedness rises (Andersson and Forsgren 2000), suggesting a positive relationship between embeddedness and outward knowledge sharing. On the other hand, high embeddedness levels may increase the tacitness of knowledge generated in the subsidiary's contacts with its external environment, reducing its potential value for other corporate units and making it more difficult to share (Lam 1997, Boekema et. al., 2000). Therefore, we do not present any hypotheses on the relationship between subsidiary external embeddedness and in- and outward knowledge sharing, but argue that its inclusion as a control is motivated.

Cultural distance. The cultural distance between two units may decrease both the willingness and the ability of the individuals in them to share knowledge. Individuals from distant cultures may for instance have negative stereotype notions of each other (Hofstede, 1991) and may be less likely to share cognitive structures. Interunit cultural distance is therefore a natural control variable in this study.

Length of relationship. Through an impact on slowly evolving routines and contact networks, the chronological duration of the relationship between two units may affect the extent to which interunit knowledge sharing can take place. Relationship length will therefore be included as a control variable.

Value chain integration. The extent to which the value chains of two units are integrated may have a bearing on the extent to which they come to share knowledge, through 'forcing' them to develop practical knowledge of each other's routines and practices. Therefore, a proxy of value chain integration will be included as a control variable.

Type of relationship. The literature on organizational trust suggests that a subsidiary's willingness to share knowledge with another unit may in some cases differ depending on whether the relationship is to a sister subsidiary or to a headquarters unit. Also,

regarding knowledge inflow, earlier research (e.g. Gupta and Govindarajan 2000) indicates that progress toward heterarchies notwithstanding, parent corporations remain central knowledge sources within MNCs. It therefore seems motivated to control for relationship type.

MNC size. Larger MNCs may be able to devote more resources to interunit knowledge sharing, larger and therefore more visible MNCs may also be subject to stronger institutional pressures (DiMaggio and Powell 1983) to share knowledge internally, given the established view that interunit knowledge sharing is a necessary precondition of MNC competitive capability. We therefore include parent MNC size as a control variable.

MNC home region. Certain characteristics of MNCs have been shown to vary across their parent company's home countries or regions, supporting arguments of the impact of mimetic isomorphism (DiMaggio and Powell, 1983) and national business systems (Ferner and Quintanilla, 1998) on MNC practices. The limited previous research on trust and shared vision in the MNC context does not permit us to present any *a priori* predictions on how these variables may be influenced by MNC home region, but controlling for them nevertheless seems motivated.

Subsidiary nationality. In analyses performed on the full sample, consisting of data from both Finnish and Chinese subsidiaries, subsidiary home country is a natural control variable. Not only are there obvious cultural differences between Finland and China, reflecting the well-known broader differences between Western and Asian cultures; there are also immense disparities in the economic structure and general business environment of the two countries.

METHODS

Sample and data collection

Data for this study were collected through structured face-to-face interviews with top managers of Finnish and Chinese subsidiaries of foreign MNCs. Finland and China were chosen so as to test the hypotheses with data from two different contexts, one

small Western industrial country and one large Asian developing country. In both cases the data collection was begun by contacting subsidiary presidents by mail. In Finland we targeted the 150 largest foreign-owned subsidiaries, in China some 300 foreign-owned subsidiaries whose contact information was available to us. The letter described the project and emphasized the confidentiality of individual responses. The respondents were then contacted by telephone to book interviews. The result was a sample of 164 subsidiaries (89 Finnish, 75 Chinese), 38 of which were US-owned, 59 Nordic-owned, and 67 European-owned. They had been part of their parent corporations for an average of 14.7 years, had a mean of 379 employees, and average annual sales of 79.7 million US $. Their parent companies had an average annual turnover of 10,544 million US $ and operated in 67 countries.

The interviews, which lasted 45-120 minutes, were conducted in 2000-2002. During the interviews, the respondents and the researchers went through a pre-tested questionnaire together and filled it out. The questionnaire language was English; any terms respondents had difficulty understanding were explained to them in another language they felt comfortable with (Finnish, Swedish, or Mandarin). The questionnaire began with questions about the focal subsidiary and its parent organization, followed by an exploration of the focal subsidiary's bilateral relationships with certain sister units. These sister units were chosen by the respondents, who were asked to focus on the unit in a specified geographical area with which they had the most intense knowledge transfer relationship. In Finland, these units were: the focal subsidiary's headquarters (defined as the unit to which it reported), one Nordic unit, one European unit, and one overseas unit. In China, the corresponding units were: the focal subsidiary's headquarters, one other corporate unit in China, one unit located elsewhere in Asia, and one overseas unit. Only some of the studied subsidiaries were involved in all four types of relationships.

After elimination of relationships that contained missing values, the final data set covered 298 relations (164 with a Finnish subsidiary as counterpart, 134 with a Chinese one).

Measures

Dependent variables

Knowledge outflow from the focal subsidiary. The outward knowledge sharing from the focal subsidiaries to other units was measured by asking the respondents to indicate, on Likert-type scales ranging from 1=not at all to 7=very much, the extent to which knowledge from their subsidiaries in the following three areas: general management, marketing & sales, and service, had been used during the last 3 years by specified other units. The mean of these three scales (3.12; S.D. 1.61) was used as a measure of outward knowledge sharing. The Cronbach alpha of the construct was 0.81.

Knowledge inflow into the focal subsidiary. The inward knowledge sharing from other corporate units into the focal subsidiaries was measured by asking the respondents to indicate, on Likert-type scales ranging from 1=not at all to 7=very much, the extent to which their subsidiary during the last 3 years had used knowledge from a specified other unit in the following three areas: general management, marketing & sales, and service. The mean of these three scales (3.39; S.D. 1.56) was used as a measure of inward knowledge sharing. The Cronbach alpha of the construct was 0.80.

Independent variables

Social interaction. Three different measures of social interaction were included in our operationalization. For each one of the three measures, respondents were asked to provide data (i) on the number of managers interacting with representatives of other units within the scope of that type of interaction, and (ii) the frequency with which they did so (on a Likert-type scale ranging from 1=less than yearly to 7=weekly). For each of the integration activities, we first divided the data on question (i) with the total number of subsidiary employees in order to account for variations in subsidiary size, then multiplied the resulting figure with the results for question (ii). The resulting three scores were then added into an index pertaining to the intensity of social interaction in interunit relationships. Following from previous work on normative integration, the specific interaction types we collected data on were:

- interunit trips and visits;

- interunit committees, teams, and task forces; and
- training involving participants from both units.

These practices are similar to those used in previous research on normative integration. However, while some previous studies have used scales where the respondents have been asked to estimate the use of a certain type of interaction on a scale from 'very rarely' to 'very frequently' (e.g., Roth et. al., 1991) or answer yes or no to whether a specific type had been used (e.g., Bartlett and Ghoshal, 1988; Gupta and Govindarajan, 2000), we use an objective estimate of the number of people involved. Arguably, this approach provides a more precise picture of the use of various normative integration mechanisms.

Shared vision. Our operationalization of shared vision builds on work by Nahapiet and Ghoshal (1998) and Tsai and Ghoshal (1998). A shared vision 'embodies the collective goals and aspirations of the members of an organization' (Tsai and Ghoshal, 1998: 467); thus, in order for it to emerge, the involved parties need to possess a shared language, a shared vocabulary, and some shared narratives (in the broad sense of all three). Building on earlier work, our operationalization aimed at covering these constructs. The following questions, graded on Likert-type scales ranging from 1=not at all to 7=very much, were used:

- 'The business practices and operational mechanisms of the two units are very similar';
- 'The organisational culture and management style is very coherent and similar across the two units';
- 'Your unit shares the same ambitions with the unit in question';
- 'Together with the other unit, you have a shared understanding of doing business'.

Similar questions have been used by Nohria and Ghoshal (1994), Tsai and Ghoshal (1998) and Simonin (1999) to measure the closely related concepts of, respectively, 'normative integration', 'shared values', and 'organizational distance'. The Cronbach alpha of the construct was 0.84 (mean = 4.96, S.D. = 1.2).

Trust. In the choice of individual items measuring trust, we followed Tsai and Ghoshal (1998) in using the following two questions, graded on 7-point Likert scales (range: 1='No, not at all', 7='Yes, absolutely'), to measure the extent to which the focal subsidiary trusted its relations:

- 'Your unit can rely on this unit without any fear that they will take advantage of your unit even if the opportunity arises;
- In general, people from this unit will always keep the promises they make to your unit.'

This type of items are commonly used to measure trust in quantitative management and organization research (see e.g. Cummings and Bromiley, 1996). The Cronbach alpha of the construct was 0.79 (mean = 5.39, S.D. = 1.3).

Mediated communication frequency. The measurement of mediated communication frequency followed established practice. Respondents were asked to indicate the frequency with which telephone and e-mail, respectively, were used for knowledge transfer between the subsidiary and other units on Likert-type scales (range: 1=low, 7=high). The sum of these two scales (10.73; S.D. = 2.54) was used as a measure of interunit mediated communication.

Control variables

Subsidiary embeddedness. Following established practice, the following four questions were used to measure subsidiary embeddedness. On Likert-type scales ranging from 1=very little to 7=very much, the respondents were asked to indicate to what extent their subsidiaries' most important external business relationships had caused adaptations concerning a) product technology, b) production technology, c) standard operating procedures, and d) business practice. The answers were averaged to form a construct measuring subsidiary embeddedness (alpha = 0.74, mean = 4.32, S.D. = 1.41).

Cultural distance. Hofstede's (1980) seminal research identified four cultural dimensions: power distance, collectivism versus individualism, femininity versus masculinity, and uncertainty avoidance. Kogut and Singh (1988) used the cultural value scores obtained by Hofstede[1] to construct a composite index of the cultural distance between headquarters and foreign subsidiaries. The following index has been used in a variety of studies, including the study by Roth and O'Donnell (1996):

$$CD_{jk} + \ln \sum \{(D_{ij} - D_{ik})^2/V_i)\}/4,$$

where CD_{jk} = the cultural distance between countries *j* and *k*, D_{ij} = the score for parent country *j* on cultural dimension *i*, D_{ik} = the score for subsidiary country *k* on cultural dimension *i*, and V_i = the variance of the index for cultural dimension *i*. The formula corrects for the variance of each cultural dimension and averages across the four dimensions.[2] This index was used as a measure of interunit cultural distance in the analyses reported below (mean = 1.46, S.D. = 1.14)

Length of relationship. For each dyad, the interviewee was asked to estimate when some kind of knowledge transfer between the units had started to take place. The log of the number of years was used in the analysis.

Value chain integration. The extent to which the focal unit was functionally integrated with a relation was estimated by asking the respondent to provide data on how many percent of the focal unit's sales were sold to the relation, and how many percent of the subsidiary's purchases were bought from that unit. These two measures were combined to a measure of value chain integration that was used in the analyses (mean = 17.2, S.D. = 31.8).

Vertical versus horizontal relationship. Relationship type was controlled for with a dummy variable coded as 0=sister subsidiary, 1=headquarters.

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[1] Cultural value scores for China were not included in Hofstede's original study, so we have relied on his later estimations of these scores as reported by Worm (1997: 92).

[2] Hofstede's measures of national culture have been criticized for instance because they were obtained from a single company and because the data were collected several decades ago. However, his measures remain the most widely used instrument for measuring national culture (Newman and Novell, 1996; Morosini et al., 1998).

Subsidiary home country. Subsidiary home country was controlled for with a dummy variable coded as 0=Finland, 1=China.

MNC size. Parent company size was operationalized as the log of the corporate annual turnover in millions of US dollars.

MNC home region. All MNCs in the sample were headquartered in the United States, the Nordic countries, or the rest of Europe. In order to control for home region effects, Nordic parentage was treated as the base case and dummy variables were created for the two other regions.

Table 1 contains summary statistics of the variables used in this study, including means, standard deviations and Pearson correlation coefficients.

Insert TABLE 1 about here

RESULTS

The results of the regression analyses performed to test our hypotheses are presented in Tables 2, 3 and 4.

Insert TABLES 2-4 about here

In regressions on the full sample, shared vision emerged as the most significant independent variable ($p<0.001$ for both in- and outward knowledge sharing), supporting hypotheses 2a and 2b. Mediated communication frequency also emerged as significantly related to both types of knowledge sharing ($p<0.001$ for outflow, $p<0.01$ for inflow), supporting hypotheses 4a and 4b. Interaction, while not significant for outflow, was significant for inflow ($p<0.001$), supporting hypothesis 1b. Trust was not significantly related to either outflow or inflow, meaning that hypotheses 3a and 3b were not supported.

Of the control variables, only cultural distance and European nationality of the parent MNC exhibited weakly significant relationships to knowledge outflow (in the case of cultural distance, this relationship was negative). For inflow, by contrast, both relationship type, longevity of the relationship, subsidiary nationality, and U.S. nationality of the parent MNC emerged as significant, albeit in varying degrees.

Shared vision remained the most consistently and strongly significant independent variable when the Finnish and Chinese subsamples were analyzed separately. The variable was significant at $p<0.001$ for both outflow and inflow in the Chinese sample, and at $p<0.01$ for both outflow and inflow in the Finnish. Interaction had a significant positive impact on inflow into Chinese subsidiaries ($p<0.01$), but not on outflow, and no significant impact on the Finnish sample. The Chinese sample further exhibited a positive relationship between trust and both types of knowledge flows, significant at $p<0.01$ for outflow and $p<0.05$ for inflow, however, no such relationship was evident in the Finnish sample. Mediated communication was positive and weakishly significant in both the Finnish and the Chinese sample.

As for the controls, the local embeddedness of the focal subsidiaries exhibited a significant positive relationship to both out- and inflow in the Chinese sample (at $p<0.05$ and $p<0.10$, respectively). In the Finnish sample, embeddedness was not significantly related to outflow, but exhibited a weakly significant *negative* relationship to inflow ($p<0.10$). The only other control in the Finnish sample which was significantly related to outflow was belonging to an European parent MNC, positive and weakly significant ($p<0.10$). For inflow, however, both relationship type and the longevity of the knowledge sharing relationship were positive and significant at $p<0.01$, and parent MNC size positive and significant at $p<0.05$.

In the Chinese sample, too, relationship type and European parentage were significantly positively related to knowledge outflow, at $p<0.05$ and $p<0.10$ respectively. Other controls exhibiting significant relationships to outflow from Chinese subsidiaries was cultural distance and value chain integration, negatively significant at $p<0.05$ and $p<0.10$, respectively. Controls with a significant positive relation to inflow into Chinese subsidiaries were relationship type at $p<0.01$, and

American or European (as opposed to Nordic) parentage, at $p<0.05$ and $p<0.10$ respectively.

Discussion

The most unambiguous of the results reported here is the strong positive relationship between shared vision and both in- and outward knowledge sharing. The strength of this relationship is further underlined by its consistency across both the Finnish and the Chinese subsamples. Mediated communication also emerged as significantly positively related to both types of knowledge sharing. The hypothesized positive impact of face-to-face interaction was supported for inward but not for outward knowledge sharing. Finally, regressions on the full sample did not support our hypotheses on trust. However, the control variable on subsidiary nationality emerged as positive and significant at $p<0.01$ for knowledge inflow, indicating significant differences between the Finnish and Chinese subsamples, and indeed trust did come out significant in the separate analysis of the Chinese subsample – not unexpectedly indicating trust is more important for knowledge sharing in certain cultures than in others. At a general level, however, we argue the results indicate strong support for considering the effects of other dimensions of social capital than the relational in future research on knowledge sharing in MNCs.

Further consistencies across subsamples are that the model explains knowledge inflows better than outflows, that shared vision remains strongly correlated with both types of knowledge sharing, and that the impact of mediated communication is consistently positive and significant. With regard to the other hypotheses, however, the findings diverge. The Chinese data supports both hypothesis 1b, hypothesis 3a, and hypothesis 3b, the Finnish data none of these. Our model thus seems to describe Chinese subsidiaries' knowledge sharing – especially of the inward kind – more accurately than that of Finnish subsidiaries. This indicates that globalization notwithstanding, considerable differences in national business environments remain – even across MNC subsidiaries. This would also seem important to take into account in future research.

As for the control variables, there are few consistent similarities. Local embeddedness seems to affect knowledge inflow into Chinese and Finnish subsidiaries in opposite

ways: while embeddedness is significantly positively related to both in- and outflow of knowledge from the former, it is weakly *negatively* related to inflow into (and not at all to outflow from) the latter. The effect of relationship type is consistent for inflow across subsamples in that both Finnish and Chinese subsidiaries receive significantly more knowledge from HQs than from sister units, but while this also holds true for outflows from Chinese subs, no such effect can be discerned in the Finnish subsample.

Cultural distance, while insignificant for both in- and outflow in the Finnish subsample and for inflow in the Chinese one, has a significant negative impact on outflow from Chinese subsidiaries. This is partly explained by both groups' knowledge sharing partners predominantly being located in the Western world, or at least in highly developed, Westernized regions of Asia such as Hong Kong or Singapore, and by the parent MNCs of all the studied subsidiaries being of Western origin. It is thus logical that cultural distance would be more of a problem, relatively speaking, for Chinese than for Finnish subsidiaries. This is of course not to say that Finnish subsidiaries' knowledge sharing would be immune to this factor.

Generally, the model seems to explain inflows of knowledge more accurately than outflows. This may at least partly be due to the HQ-focused approaches previously dominant in the field of international business: the previous research on which our hypotheses are based has tended to focus on inward knowledge sharing. Our results seem to indicate that more progress has been made in exploring this type of knowledge sharing, as opposed to focusing on the contributions of subsidiaries. Gupta and Govindarajan (2000), who found similar results, attributed them both to the greater magnitude of knowledge inflows compared to other types of knowledge flows; to the fact that that the typical MNC has the longest experience in managing this type of flows and therefore likely manage them more systematically than other types of flows; and noted that 'notwithstanding the fact that MNCs are indeed becoming 'heterachies', [...], the parent corporation continues to serve as the most active creator and diffuser of knowledge within the corporation' (Gupta and Govindarajan 2000:490).

Suggestions for further research

Our findings indicate that future students of knowledge sharing in MNCs should devote a larger proportion of their interest than hitherto to the "soft" dimensions of interunit relationships, as exemplified in our study by trust and, particularly, shared vision. We would also recommend a more nuanced examination of differences in national business environments, as well as some carefulness in applying models and theories developed in a particular cultural context to other contexts. Methods and mechanisms which promote knowledge sharing in one context may not do so in another.

References

Andersson and Forsgren 2000

Andersson, Forsgren and Holm 1999

Bartlett, C. A. and Ghoshal, S. (1986): 'Tap your subsidiaries for global reach'. *Harvard Business Review*, 64 (6): 87-94.

Bartlett, C. A. and Ghoshal, S. (1987): 'Managing across borders: New organizational responses'. *Sloan Management Review*, 29 (1): 47-57.

Bartlett, C. and Ghoshal, S. (1989 and later issues): *Managing Across Borders: The Transnational Solution*. Harvard Business School Press, Boston, MA.

Bartlett, C. A. and Ghoshal, S. (1995). 'Changing the role of top management: From systems to people'. *Harvard Business Review*, 73 (3): 132-144.

Birkinshaw, J. (1994): 'Approaching heterarchy. A review of the literature on multinational strategy and structure'. *Advances in International Comparative Management*, 9: 111-144.

Birkinshaw, J. (1996). 'How multinational subsidiary mandates are gained and lost'. *Journal of International Business Studies*, 27: 467-495.

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Bresman, H., Birkinshaw, J., and Nobel, R. (1999): 'Knowledge Transfer In International Acquisitions', *Journal of International Business Studies* 30 (3), p. 439-461.

Durkheim, E. (1933): *The division of labor in society*. New York: Free Press.

Edström, A. and Galbraith, J. (1977): 'Transfer of Managers as a Coordination and Control Strategy in Multinational Organizations'. *Administrative Science Quarterly*, Vol. 22, p. 248-263.)

Etzioni, A. (1961): *A comparative analysis of complex organizations*. New York: Free Press.

Forsgren, M., Johanson, J., and Sharma, D. (2000): '**XXX**'. In Holm, U. and Pedersen, T. (eds): *The Emergence and Impact of MNC Centres of Excellence: A Subsidiary Perspective*. 45-67. Basingstoke: MacMillan Press.

Fulk, J. and DeSanctis, G. (1995): 'Electronic communication and changing organizational forms'. Organizational Science, 6 (4): 337-349.

Galbraith, J. R. and Kazanjian, R. K (1986): *Strategy Implementation: Structure, Systems and Process*. 2nd edition. West Publishing Co., St. Paul.

Ghoshal, S., and Bartlett, C. A. (1988): 'Creation, adoption and diffusion of innovations by subsidiaries of multinational corporations'. *Journal of International Business Studies*, 19 (3): 365-388.

Ghoshal, S. and Bartlett, C. A. (1990). 'The multinational corporation as an interorganizational network'. *Academy of Management Review*, 15: 603-625.

Ghoshal, S., Korine, H. and Szulanski, G. (1994). 'Interunit communication in multinational corporations'. *Management Science*, 40 (1): 111-122.

Ghoshal, S. and Nohria, N. (1989). 'Internal differentiation within multinational corporations'. *Strategic Management Journal*, 10: 323-337.

Ghoshal, S., and Nohria, N. (1993): 'Horses for courses: Organizational forms for multinational corporations'. *Sloan Management Review*, (Winter): 23-35.

Ghoshal, S. and Westney, E. (eds) (1993): *Organizational Theory and the Multinational Corporation*. St. Martin's Press, New York, NY.

Gupta, A.K. and Govindarajan, V. (1991). 'Knowledge flows and the strucuture of control within multinational corporations'. *Academy of Management Review*, 16: 768-792.

Gupta, A.K. and Govindarajan, V. (1994). 'Organizing for knowledge flows within MNCs'. *International Business Review*, 3: 443-457.

Gupta, A.K., Govindarajan, V., and Malhotra, A. (1999). 'Feedback-seeking behavior within multinational corporations'. *Strategic Management Journal*, 20: 205-222.

Hecksher, C.: 'Defining the Post-Bureaucratic Type'. In Heckscher, C. and Donnellon, A. (eds) (1994): *The Post-Bureaucratic Organization: New Perspectives on Organizational Change*. Sage Publications, Thousand Oaks, CA.

Hedlund, G. (1986): 'The hypermodern MNC: A heterarchy?'. *Human Resource Management* 25: 9-35.

Hedlund, G.: 'Assumptions of heterarchy and hierarchy'. In Ghoshal, S. and Westney, D. E. (eds) (1993): *Organization Theory and the Multinational Corporation*. St. Martin's Press, New York, NY.

Hedlund, G. and Kogut, B.: 'Managing the MNC: The end of the missionary era'. In *The United Nations Library on Transnational Corporations*, volume 6. Hedlund, G. (ed.) (1993): Organization of Transnational Corporations. Routledge, New York, NY.

Hofstede, G. 1980. Culture's consequences: International differences in work-related values. Beverly Hills, CA: Sage.
Huczynski, A. and Buchanan, D. (1991): *Organisational Behaviour*. Prentice Hall, London.
Kogut, B. and Singh, H. 1988. The effect of national culture on the choice of entry mode, Journal of International Business Studies, 19: 17-31.
Kogut, B. and Zander, U. (1993). 'Knowledge of the firm and the evolutionary theory of the multinational corporation'. *Journal of International Business Studies*, 24: 625-645.
Lam, (1997)
Marschan, R. (1996): *New Structural Forms and Inter-Unit Communication in Multinationals: The Case of Kone Elevators*. Acta Universitatis Oeconomicae Helsingiensis A-110. Helsinki School of Economics and Business Administration, Helsinki.
Marschan, R., Welch, D., and Welch, L. (1997): 'Language: the forgotten factor in multinational management?' *European Management Journal*, 15, p. 591-598.
Marschan-Piekkari, R., Welch, D. E., and Welch, L. S. (1999a). 'In the shadow: The impact of language on structure, power and communication in the multinational'. *International Business Review*, 8 (4): 421-440.
Marschan-Piekkari, R., Welch, D. E., and Welch, L. S. (1999b). 'Adopting a common corporate language: IHRM implications'. *The International Journal of Human Resource Management*, 10 (3): 377-390.
Martinez, J. I. and Jarillo, J. C. (1989): 'The Evolution of Research on Coordination Mechanisms in Multinational Corporations'. *Journal of International Business Studies* 20 (3): 489-514.
Morosini, P., Shane, S. and Singh, H. 1998. National culture distance and cross-border acquisition performance. Journal of International Business Studies, 29: 137-158.
Morrison, A. J. and Roth, K. (1992): 'A taxonomy of business-level strategies in global industries'. *Strategic Management Journal* 1992 (6): 399-417.
Nahapiet, J. and Ghoshal, S. (1998). 'Social capital, intellectual capital, and the organizational advantage'. *Academy of Management Review*, 23 (2): 242-266.
Nohria, N. and Eccles, R.: 'Face to face. Making network organizations work'. In Nohria, N. and Eccles, R. (eds) (1992): *Networks and Organizations: Structure, Form and Action*. Harvard Business School Press, Boston, MA.
Nohria, N. and Ghoshal, S. (1994): 'Differentiated fit and shared values'. *Strategic Management Journal*, 15: 491-502.
Porter, M.E. (ed.) (1986): *Competition in Global Industries: A Conceptual Framework*. Harvard Business School Press, Boston, MA.
Prahalad, C. K. and Doz, Y. L. (1987): *The Multinational Mission. Balancing Local Demands and Global Vision*. The Free Press, New York, NY.
Romm, C. T., Pliskin, N. and Rifkin, W. D. (1996): 'Diffusion of E-mail: an organisational learning perspective'. *Information & Management*, 31 (1): 37-46.
Roth, K. and O'Donnell, S. (1996). 'Foreign subsidiary compensation strategy: An agency theory perspective'. *Academy of Management Journal*, 39: 678-703.
Roth, K., Schweiger, D. M., and Morrison, A. J. (1991): 'Global strategy implementation at the business unit level: Operational capabilities and administrative mechanisms'. *Journal of International Business Studies*, 22 (3): 369-402.
Selznick, P. (1965): *TVA and the grass roots.* New York: Harper Torchbooks.
Tsai, W. and Ghoshal, S. (1998). 'Social capital and value creation: The role of intrafirm networks'. *Academy of Management Journal*, 41 (4): 464-476.
Worm, V. (1997): *Vikings and Mandarins. Sino-Scandinavian Business Cooperation in Cross-Cultural Settings.* Copenhagen: Copenhagen Business School Press.

Table 1: Means, standard deviations and correlations of the studied variables (for full sample)

Means, standard deviations, and Pearson correlation coefficients among variables under study (decimal points omitted from correlation coefficients due to space constraints)

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
V1:KL outflow	3.12	1.6	.														
V2:KL inflow	3.39	1.6	51**	.													
V3:Interaction	0.57	1.0	15**	28**	.												
V4:Shared vision	4.97	1.2	36**	37**	24**	.											
V5:Trust	5.39	1.3	17**	22**	14*	47**	.										
V6:Mediat.comm	10.7	2.5	31**	27**	14*	18**	01	.									
V/: Embeddedness	4.32	1.4	12*	01	-04	01	-08	08	.								
V8: Rel. type (0=sister, 1=HQ)	0.40	0.5	03	26**	06	02	10*	15**	-01	.							
V9:Rel.length(log)	0.72	0.5	07	22**	-09	05	-01	07	-03	09	.						
V10: Cult.distance	1.46	1.1	-09	08	08	-04	07	-03	04	23**	-09	.					
V11:VC.integrat.	17.2	32	00	13**	19**	-04	-03	16**	-06	26**	16**	10	.				
V12: Sub cntry (FIN 0, PRC 1)	0.49	0.5	-03	11*	27**	04	16**	-04	-18**	-02	-35**	45**	01	.			
V13: MNC size (log, MUSD)	3.45	0.9	06	06	-19**	05	-07	05	-08	-08	28**	-20**	-07	-23**	.		
V14: US MNC	0.25	0.4	07	12**	-02	09	01	03	06	-06	25**	-12*	00	-30**	25**	.	
V15: Euro MNC	0.41	0.5	00	-00	02	-14**	-11*	06	-08	00	05	-01	07	18**	25**	-48**	.

**. Correlation significant at the 0.01 level (1-tailed)

*. Correlation significant at the 0.05 level (1-tailed)

Table 2: Multiple regression analysis: Antecedents of knowledge sharing in MNCs between all subsidiaries and their relations (full sample; n=298)

Data in the table present standardized regression coefficients.

	Knowledge outflow from sub	*Knowledge inflow into sub*
Social interaction	.068	.171***
Shared vision	.329***	.277***
Trust	.011	.047
Mediated communication	.199***	.136**
Subsidiary embeddedness	.035	-.030
Type of relation (0=sister,1=HQ)	.053	.237***
Longevity of relation	.026	.179***
Cultural distance	-.105*	-.063
Value chain integration	-.057	.008
Subsidiary nationality (0=FIN, 1=PRC)	.063	.169**
MNC size	-.016	.018
U.S. MNC	.074	.139*
European MNC	.122*	.024
R	.469	.576
R2	.220	.332
Adj. R2	.184	.301
F	6.189***	10.921***

+ one-tail p <.10
* one-tail p<.05
** one-tail p< .01
*** one-tail p< .001

Table 3: Multiple regression analysis: Antecedents of knowledge sharing in MNCs between Chinese subsidiaries and their relations (n=134)

Data in the table present standardized regression coefficients.

	Knowledge outflow from sub	*Knowledge inflow into sub*
Social interaction	.047	.182**
Shared vision	.404***	.334***
Trust	.183**	.133*
Mediated communication	.125+	.158*
Sub embeddedness	.151*	.107+
Type of relation	.139*	.258**
Longevity of relation	-.004	.070
Cultural distance	-.201*	-.077
Value chain integration	-.103+	.028
MNC size	-.062	-.095
U.S. MNC	-.031	.131*
European MNC	.120+	.144+
R	.643	.681
R2	.413	.463
Adj. R2	.355	.410
F	7.148***	8.772***

+ one-tail p <.10
* one-tail p<.05
** one-tail p< .01
*** one-tail p< .001

Table 4: Multiple regression analysis: Antecedents of knowledge sharing in MNCs between Finnish subsidiaries and their relations (n=164)

Data in the table present standardized regression coefficients.

	Knowledge outflow from sub	*Knowledge inflow into sub*
Social interaction	.054	.091
Shared vision	.274**	.254**
Trust	-.115	.011
Mediated communication	.172*	.112+
Sub embeddedness	-.041	-.112+
Type of relation	.059	.204**
Longevity of relation	.002	.208**
Cultural distance	.041	-.025
Value chain integration	-.017	-.005
MNC size	-.034	.173*
U.S. MNC	.120	.032
European MNC	.189+	-.094
R	.365	.522
R2	.133	.273
Adj. R2	.064	.215
F	1.942*	4.746***

+ one-tail p <.10
* one-tail p<.05
** one-tail p< .01
*** one-tail p< .001