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# Contextual Transfer Barriers, Social Interaction, and Innovation Transfer Performance

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## Introduction

When multinational corporations (MNCs) intend to share knowledge and transfer innovation to their overseas subsidiaries as well as partners (e.g., suppliers and customers), there are often barriers to hinder their efforts. There are direct barriers, such as lack of willingness to send or receive (Katz and Allen 1982; Michailova and Husted 2003), as well as insufficient capability to transfer or absorb new knowledge (Allen 1977; Cohen and Levinthal 1990; Szulanski 1996). Typically, these barriers exist in sending organizations, receiving organizations, or both, and can prohibit the knowledge sharing process.[1]

There are also barriers presented in the context where knowledge sharing processes are taken place (Ambos et al. 2006; Gupta and Govindarajan 1994; Simonin 1999; Szulanski 1996). For instance, there can be strong difference in cultural and institutional settings in senders and receiver's respective countries (Ado et al. 2016; Busse et al. 2016; Ho et al. 2017; Lin et al. 2008). Additionally, the technological standards adopted by senders and receivers

[1] We use senders and receivers in this chapter to simply refer to the two organizations involved in the transfer. We are aware that the use of sender-receiver could bring out an assumption that there is a specific communication channel involved (Noorderhaven and Harzing 2009), and we do not held this assumption in this study.

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can also be varied in different parts of the world (Dyer and Hatch 2006). Lastly, the markets where senders and receivers are located can also be in different stage of development and condition (Buckley et al. 2003; Busse et al. 2016). These contextual barriers exist in the surrounding environment, rather than in the organization per se. As such, despite being aware of these contextual barriers and their potential influence on the process of knowledge sharing (Busse et al. 2016), it is rather difficult for MNCs to alter or change them directly.

While past studies have tended to focus on the transfer barriers that exist in the organizations, the influences of contextual barriers on knowledge sharing process have received relatively limited attention. Particularly for the transfer within an organization, scholars tend to look for factors internally hindering the transfer process such as sender's motivation and involvement (Björkman et al. 2004; Ciabuschi et al. 2011; Gupta and Govindarajan 2000); receiver's motivation and capability (Gupta and Govindarajan 2000; Lane et al. 2001), as well as receiver's autonomy (Ciabuschi et al. 2012; Noorderhaven and Harzing 2009; Szulanski 1996). The contextual barriers are rather overlooked, as literature generally assumes external obstacles do not matter much particularly when knowledge is shared within MNCs (Szulanski 1996). Yet, studies have shown that, in a mature stage of a joint venture, contextual barriers still play a relative important role affecting knowledge sharing process. Hence, there is a lack of understanding and gap in literature on MNCs handling contextual barriers during the process of sharing knowledge and innovation transfer.

In this study, we want to fill this gap by investigating contextual barriers' influence on MNCs innovation transfer process. More specifically, we aim to answer following questions: How MNCs address contextual barriers through social interactions? And what effects these social interactions have on innovation transfer performance? Social interactions, that is, interpersonal connection building and social network developing, are proved to be an effective tool for knowledge sharing and innovation transfer within MNCs (Maurer et al. 2011; Noorderhaven and Harzing 2009; Vahlne and Johanson 2017).

Social interactions describe a range of activities held between senders and receivers, for instance, face-to-face meeting, temporary task team, and workshop and conference. Participating individuals establish and develop social relations during these occasions, and create social capital (Adler and Kwon 2002). With social capital, a collaborative and a supportive environment can be sustained and enable MNCs to address contextual barriers and facilitate knowledge sharing and innovation transfer (Inkpen and Tsang 2005; Kostova and Roth 2003).

Therefore, we adopt a sequential mixed-method research design integrating survey and interview data to understand the impact of social interactions on the contextual barriers and transfer performance. Our findings show that, in contrast to conventional wisdom, knowledge sharing within MNCs will be impacted by contextual barriers. Social interactions between sending and receiving units play a vital role for MNCs to overcome contextual barriers. Yet, there is a price to pay in terms of the efficiency of the transfer, as social interaction may take time to organize and can be costly. Hence, our study contributes to the continue discussions of knowledge sharing within MNCs, and shed light on the double-edge role of social interaction in innovation transfer.

The chapter is organized as follows: the next section reviews the literature on social interactions and contextual transfer barriers. The method section covers a mixed-method research design, operationalization of variables, and data collection. This is followed by analysis, result, and discussion. Lastly, a concluding remark, implications for management, and topics for future research is presented.

## Literature Review and Conceptual Framework

### Contextual Transfer Barrier and Transfer Performance

Literature has long been argued that MNCs enjoy a competitive advantage on sharing knowledge within the boundary of the firm relatively uncomplicated and easy manner (Kogut and Zander 1993; Zander and Kogut 1995). Innovation invented in the headquarters or subsidiaries can be transferred to other part of the corporation across the international border (Bartlett and Ghoshal 1989; Gupta and Govindarajan 2000). Although the view on MNCs has gradually shifted from a centrally and hierarchically constructed organization (Buckley and Casson 1976; Dunning 1980) to a dispersed network with units embedded in various environments (Ghoshal and Bartlett 1990; Forsgren et al. 2006), the ability to facilitate and coordinate knowledge flow remain to be a core advantage of MNCs, and an important research topic for management scholars (Ambos et al. 2006; Björkman et al. 2004; Ciabuschi et al. 2011, 2012).

Knowledge sharing is not easy even if it is within MNCs, and it has been widely discussed in the International Business literature (see a review by Hutzschenreuter and Matt 2017). While most of the researches focus on factors resided in either or both sending and receiving units, we find very little

attention paid to the contextual barriers affecting the process and performance of knowledge sharing in MNCs. It might be the case that MNCs are assumed to be an entity with strong shared organizational culture, and therefore the transfer made within should not be interfered much by the factors outside the organizations (Ambos et al. 2006; Szulanski 1996).

However, MNCs and their subsidiaries are embedded in home and host countries with significant difference in institutional environment (Eden and Miller 2004; Xu and Shenkar 2002). The institutional distance has a clear impact on the success of transferring routines within MNCs (Kostova and Roth 2002; Zaheer 1995). In fact, subsidiaries of MNCs in respective host countries are influenced by distinctive socialization process based on local and national context (Kostova et al. 2008; Phillips and Tracey 2009). These differences can pose contextual barriers and challenges to the knowledge sharing process (Forsgren 1997).

Contextual barriers are defined as factors that exist in the environment which hinder the flow of knowledge between sending and receiving units (Ambos et al. 2006; Busse et al. 2016; Gupta and Govindarajan 1994; Simonin 1999). Contextual barriers are difficult to change, as they exist in the external environment of the organizations. Culture differences are found to be a major obstruction to the communication, which can make knowledge sharing challenging (Busse et al. 2016; Lin et al. 2008). Individual involved in knowledge sharing may misread cues and cause misunderstandings because of their ignorance of the counterpart's culture (Busse et al. 2016). Different institutions can have great variety of organization routine and management control system. Knowledge or innovation may need to be translated or interpreted so that it can be understood from a receiving unit's point of view (Gupta and Govindarajan 1994; Ho et al. 2017).

Additionally, technological standards adopted by sending and receiving units can also be varied in different parts of the world. Although modification may not be difficult, it will still take extra effort to do so (Dyer and Hatch 2006). Lastly, the market condition where sending and receiving units are located may also be distinctive. It will be problematic for sending unit to impose certain innovations that simply is susceptible to market conditions (Buckley et al. 2003; Busse et al. 2016). We propose these following hypotheses:

*Hypothesis 1a* Contextual barriers are negatively related with the efficiency of innovation transfer

*Hypothesis 1b* Contextual barriers are negatively related with the effectiveness of innovation transfer

## Social Interaction and Social Capital

Past studies show that social interactions facilitate knowledge sharing within MNCs (Björkman et al. 2004; Noorderhaven and Harzing 2009). Hansen (1999) and Amesse and Cohendet (2001) show that direct contacts between individuals are vital in achieving an effective knowledge sharing process. Particularly for knowledge that is tacit and abstract in nature, social interactions are necessary for the process of sharing (Dhanaraj et al. 2004; Lawson et al. 2008; Noorderhaven and Harzing 2009). Since tacit knowledge tends to be context specific (Polanyi 1967), it makes even more subjective to the influence of contextual barriers during the transfer process.

MNCs can encourage social interactions between sending and receiving units to help information flow, knowledge sharing, and overcome contextual barriers. Two-way information exchanges in the social interactions can increase the transparency of the information in the sharing process (Lawson et al. 2008), and avoid transmission losses (Noorderhaven and Harzing 2009). Besides, non-verbal and visual cues can be carried out in social interactions, which will enrich communication and enable individuals to develop rapport between each other (Gupta and Govindarajan 2000; Dhanaraj et al. 2004; Kraut et al. 2002). Through the activities in these social interactions, individuals can connect and develop ties that allow information to pass through (Granovetter 1973, 1983).

Gupta and Govindarajan (2000) found that a subsidiary can build a linkage to the rest of MNCs through social interactions, thus facilitating knowledge flow. Björkman et al. (2004) also shows that interaction between managers within MNC units lead to knowledge sharing. Social interactions in MNCs can take place in the form of team meetings, cross-functional teams, joint workshops, and temporary or permanent task forces (Bresman et al. 1999; Gupta and Govindarajan 1994; Noorderhaven and Harzing 2009). Contacts and relationship can be built through interactions on the individual level, which allow the development of trust, share norms, as well as common identification (Inkpen and Tsang 2005; Mäkelä et al. 2007).

We suggest these social ties between individuals create sufficient social capital to help overcome the contextual barriers existed in the knowledge sharing process. Social capital is defined as an aggregated resource "embedded within, available through, and derived from the network of relationship possessed by an individual or social units" (Nahapiet and Ghoshal 1998, p. 243). Social capital in this broader definition accommodates both the private and public good perspective (Adler and Kwon 2002; Inkpen and Tsang 2005; Kostova

and Roth 2003), and the resources (e.g., knowledge) is included in its notion. As social ties develop, the resources become more available to the member of these connected relationship (Oh et al. 2004).

Ongoing social interactions enable the accumulation of social capital, which facilitate the continuing flow of information and knowledge sharing (Gooderham et al. 2011; Inkpen and Tsang 2005; Kostova and Roth 2003; Nahapiet and Ghoshal 1998). Through social capital, individuals are bridged and connected despite the presence of contextual barriers (Oh et al. 2004). New information and knowledge can be easier to share and adapt within cooperative environment (Noorderhaven and Harzing 2009; Lynskey 1999). However, Maurer et al. (2011) caution for striving quantify of ties to create stronger social capital, and suggest it is the strength of ties facilitate the transfer tacit and complex knowledge. Hence, we postulate the following hypotheses:

*Hypothesis 2a* Social interaction mediates the relationship between contextual barriers and the efficiency of innovation transfer.

*Hypothesis 2b* Social interaction mediates the relationship between contextual barriers and the effectiveness of innovation transfer.

## Methodology

We adopted a sequential mixed-method research design to first examine the relationship between variables and then provide rich information to support our findings. By the term "sequential," we mean there are two phases of data collection and analyses (Creswell 2014). Doing so, we give priority to the quantitative data collected and analyzed in the first phase, and use qualitative data to provide support and contextualize our findings (Birkinshaw et al. 2010; Bresman et al. 1999).

### Quantitative Survey Data Collection

In the first phase, survey was conducted to collect quantitative data. This survey was part of a broader research project focusing on MNCs' technology development and transfer. While the overall questionnaire was developed to collect data on both aspects, we carefully selected questions that specifically related to the theoretical concepts in this study. These questions are anchored

in the literature and asked informants to respond in a seven-point Likert scale. The standardized questionnaire was pretested through pilot interviews to revise ambiguous questions.

The survey was administrated through face-to-face interviews with project and R&D managers and engineers involved in the innovation transfer process. More often than not several respondents were present at the interview, having been responsible for different aspects of the innovation development and transfer. The respondents were encouraged to elaborate on their answers, while at the same time carefully selecting the most appropriate answer in the questionnaire. Each survey took about two to four hours to complete. The research method employed for the data collection offers the advantage of providing high-quality data, by reducing the missing data for individual questions to a minimum and ensuring that the objectives of the questions are met (cf. Fowler 1993). To have more than one respondent in these surveys also enable us to avoid respondent bias due to memory loses, as the answers from other respondents can be used for the purpose of validation and triangulation.

Data was collected from 25 participating MNCs in different manufacturing industries, for example, paper and pulp, machinery and equipment, electrical machinery, and motor vehicles. The final sample contains a total of 173 observations of transferring a new technology, relating to 87 different innovations. These technology transfer projects were all completed but not more than ten years at the time of our interview. All these MNCs are located in advance economies, and these technology transfer projects are predominately taken place in Europe (77.7 percent), Asia (18.8 percent), and North America (3.5 percent).

## Qualitative Interview Data Collection

In the second phase of the research, we collected qualitative data to build up an illustrating case to assist our understanding of the use of social interaction in technology transfer projects. Qualitative data was collected through face-to-face semi-structured interviews and onsite observations (Cassell and Symon 2004). These interviews and onsite observations provide first-hand description by the informants on how social interactions are purposely adopted by the focal firm in transferring technology to customers (King 2004; Kvale 1996). Each interview lasted about one to one-and-half hour, and the observations took place during a meeting between the focal firm and their customer. Our interviews were designed to probe further what social interac-

tions were utilized, how and where they took place, and the potential influence over the transfer process (Yeung 1995; Yin 2009). The insights obtained from the qualitative data provided a context that is not available to quantitative studies, which enable us to approach the research phenomenon with a reflective and holistic view (Silverman 2010).

We chose to focus on the technology transferred between a Swedish iron powder manufacture (HG), their R&D center in China (C-R&D), and their customers (DX) in automobile part and component manufacturing. Iron powder is widely used in the automobile industry to manufacture parts and components. HG is one of the world's leading suppliers of iron powder, and owns factories producing iron powder in Sweden and the United States. We approached HG and requested interviews with managers in headquarter in Sweden, regional headquarters and R&D center in China. We also gain access to one of their tech workshops with customers DX held in Shanghai to shadow and observe their interactions. In total, five interviews and one onsite observation were conducted.

## Operationalization of Variables

The independent variable, *Contextual Barriers*, refers to factors that will potentially create difficulties in the transfer process between sending and receiving units. Following Busse et al. (2016), we include three items, that is, difference in market condition, technology standard, and culture.

The dependent variable, *Transfer Performance*, measures both efficiency by looking at the cost and the speed of the transfer (Teece 1977; Hansen et al. 2005; Pérez-Nordtvedt et al. 2008), and effectiveness on the implementation and adaptation of the transfer (Zander and Kogut 1995; Szulanski 1996; Pérez-Nordtvedt et al. 2008).

The moderating variable, *Social Interaction*, is measured by the extensiveness of the communication between individuals in sending and receiving units. This variable is indicated by the use of face-to-face meetings (Bresman et al. 1999), the use of temporary trainings (Barner-Rasmussen and Björkman 2005), the use of cross unit teams and project groups (Ghoshal et al. 1994), as well as the use of conferences and workshops.

Lastly, we control for four variables that may have an impact on the dependent variable. *Age of Relationship* looks at the duration of the relationship between sending and receiving units. *Level of Previous Relationship* takes into account the intensiveness of the relationship between sending and receiving units. One may expect when relationship between parties is in a more matured

stage and more intensive, there may be existing routines developed to facilitate the transfer (Nelson and Winter 1982; Szulanski 1996). In addition, stronger trust and attachment can also be formed when both parties worked together in the past (Gulati 1995; Inkpen and Beamish 1997). Additionally, we control for *Relevance of Technology,* as there may be stronger incentives from either sending or receiving units to achieve a better transfer performance when they perceive the technology is more valuable, or important to the organization (Schulz 2003). Moreover, *Knowledge Tacitness* is adopted to control the level of transferability, since tacit knowledge is associated with great transfer challenges. Tacit knowledge is less codified, which can cause difficulties for sending units to share and for receiving unit to adapt (Kogut and Zander 1993; Zander and Kogut 1995; Szulanski 1996).

The Appendix lists the variables and their indicators used in the questionnaire, measured in a seven-point Likert scale except for the age of relationship. All variables showed high inter-item reliability with Cronbach's alpha above the recommended threshold value of 0.70 (Hair et al. 2006), except for the *Transfer Efficiency* variable (Cronbach's alpha 0.67). However, when there are a small number of items in the scale (fewer than ten), the mean inter-item correlation (MIC) value can be used to further support the reliability of the items. Optimal MIC values range from 0.2 to 0.4 (recommended by Briggs and Cheek 1986). The MIC value for the *Transfer Efficiency* variable was 0.39 which is within the rage of optimal MIC values. We further take Herman's factor analysis to examine the extent of common method bias (Podsakoff and Organ 1986). The result shows five factors with eigenvalues greater than 1.0, and together they accounted for 65.7 percent of the total variance explained with first two factors are loaded 17.7 and 15.2 percent, respectively. This indicates that common method bias is not a significant problem.

## Analysis and Findings

### Quantitative Analysis

We first adopt Fishbein's (1963) equation for basic multi-attribute measurement model before analyzing the data in OLS regression. Descriptive statistics and the correlation matrix of the variables can be seen in Table 4.1. Some significant correlations exist between variables; however, a rule of thumb is above 0.7 (cf. Hair et al. 2006) and none of the correlations were high enough to indicate potential multicollinearity. To check for further multicollinearity

**Table 4.1** Descriptive statistics and correlations

| Variable | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 Transfer efficiency | 3.79 | 1.29 | – | 0.62** | −0.34 | −0.27** | 0.06 | −0.11 | −0.07 | −0.07 |
| 2 Transfer effectiveness | 5.03 | 1.49 | 0.62** | – | −0.41 | −0.11 | 0.14 | 0.08 | 0.04 | −0.18* |
| 3 Contextual transfer barrier | 2.36 | 1.36 | −0.33** | −0.40** | – | 0.09 | −0.22** | −0.16* | 0.06 | 0.08 |
| 4 Social interaction | 3.89 | 1.53 | −0.27** | −0.11 | 0.09 | – | 0.04 | 0.12 | −0.02 | −0.01 |
| 5 Age of relationship | 17.96 | 17.07 | 0.06 | 0.14 | −0.22** | 0.04 | – | 0.43** | −0.13 | 0.03 |
| 6 Previous relationship | 4.74 | 1.57 | −0.11 | 0.08 | −0.16* | 0.12 | 0.43** | – | 0.09 | −0.16* |
| 7 Relevance of innovation | 5.15 | 1.31 | −0.07 | 0.04 | 0.07 | −0.02 | −0.13 | 0.09 | – | 0.18* |
| 8 Tacit knowledge | 2.50 | 1.55 | −0.07 | −0.18 | 0.08 | −0.01 | −0.03 | −0.16* | 0.18* | – |

N = 173

**$P < 0.01$; *$P < 0.05$

All two-tailed tests

in moderating variables, the variance inflation factor (VIF-values) were calculated. A common cut-off threshold for VIF-value is 10 (cf. Hair et al. 2006, p. 230), none were greater than 1.43 thus multicollinearity does not appear to pose any severe problems.

Moreover, Kolmogorov-Smirnov test was carried out to check for normal distribution. The result shows that all variables but the dependent variable *contextual barriers* have significance value greater than 0.06 (less than 0.05 will indicate a tendency of non-normality). To further examine the actual degree of departure from normality, a normal probability plot was carried out, and all the variables were normally distributed (Hair et al. 2006). Lastly, heteroscedasticity and non-linearity diagnosis were made by plotting the studentized residual against the predicted dependent variable. There seems to be no heteroscedasticity and non-linearity problem.

The first regression analyses using the *transfer efficiency* as a dependent variable (see Table 4.2) showed that there was no significant effect on the *transfer efficiency* by the control variables (model 1: *F*-value 1.75 and adjusted $R^2$ 0.02). Model 2 (*F*-value 4.03 at $p < 0.01$ and adjusted $R^2$ 0.12) showed that the *contextual transfer barrier* has a negative effect on the *transfer efficiency*. As well as *social interaction* showing a negative effect on the *transfer efficiency* (model 3: *F*-value 2.65 at $p < 0.05$ and adjusted $R^2$ 0.08). In model 4 (*F*-value 3.74 at $p < 0.001$ and adjusted $R^2$ 0.15), the

**Table 4.2** Results of OLS estimations[a]

| | Dependent variable: transfer efficiency | | | |
|---|---|---|---|---|
| Independent variables | Model 1 | Model 2 | Model 3 | Model 4 |
| Age of relationship | 0.19(1.91)† | 0.10(0.93) | 0.11(1.05) | 0.05(0.45) |
| Previous relationship | −0.22(−2.16)* | −0.16(−1.60) | −0.09(−0.82) | −0.91(−0.85) |
| Relevance of innovation | −0.02(−0.21) | 0.08(0.89) | 0.06(0.60) | 0.09(0.93) |
| Tacit knowledge | −0.12(−1.22) | −1.80(−1.89)† | −0.21(−2.13)* | −0.19(−2.01)* |
| Contextual transfer barrier | – | −0.33(−3.55)*** | – | −0.33(−3.43)*** |
| Social interaction | – | – | −0.24(−2.49)** | −0.19(−1.97)† |
| Barrier * Social interaction | – | – | | 0.05(0.56) |
| $R^2$ | 0.06 | 0.16 | 0.11 | 0.20 |
| Adjusted $R^2$ | 0.02 | 0.12 | 0.08 | 0.15 |
| *F*-value | 1.75 | 4.03** | 2.65* | 3.74*** |

***$P < 0.001$; **$P < 0.01$; *$P < 0.05$; †$P < 0.10$

All two-tailed tests

[a]Standardized coefficients with *t*-values in parentheses

**Table 4.3** Results of OLS estimations[a]

| | Dependent variable: transfer effectiveness | | | |
|---|---|---|---|---|
| Independent variables | Model 1 | Model 2 | Model 3 | Model 4 |
| Age of relationship | 0.16(1.76)† | 0.64(0.72) | 0.13(1.39) | 0.05(0.61) |
| Previous relationship | −0.04(−0.47) | −0.02(−0.23) | 0.01(0.10) | −0.04(−0.56) |
| Relevance of innovation | 0.13(1.51) | 0.17(2.08)* | 0.16(1.88)† | 0.28(3.85)*** |
| Tacit knowledge | −0.21(−2.43)* | −0.22(−2.76)** | −0.25(−2.87)** | −0.30(−4.15)*** |
| Contextual transfer barrier | – | −0.41(−5.23)*** | – | 0.12(1.64)† |
| Social interaction | – | – | −0.09(−1.05) | −0.56(−7.64)*** |
| Barrier * Social interaction | – | – | – | 0.20(2.64)** |
| $R^2$ | 0.06 | 0.24 | 0.08 | 0.39 |
| Adjusted $R^2$ | 0.03 | 0.21 | 0.05 | 0.36 |
| *F*-value | 2.17† | 8.30*** | 2.47* | 12.01*** |

***$P < 0.001$; **$P < 0.01$; *$P < 0.05$; †$P < 0.10$
All two-tailed tests
[a]Standardized coefficients with *t*-values in parentheses

interaction effect showing the usage of social interaction to overcome contextual transfer barriers showed no significance. The results indicate that contextual transfer barriers deter transfer efficiency and the social interaction also does not lead to efficient transfer. This is due to the fact that social interaction is costly and time consuming. Accordingly, hypothesis 1a is supported. However, the moderating effect of social interaction on contextual transfer barrier showed no significance; therefore hypothesis 2a is not supported.

In the regression analyses with *transfer effectiveness* as the dependent variable (see Table 4.3), the control variables explained very little of the variance (model 1: *F*-value 2.17 at $p < 0.10$ and adjusted $R^2$ 0.03). In model 2 (*F*-value 8.30 at $p < 0.001$ and adjusted $R^2$ 0.21), contextual transfer barrier showed negative effect on transfer effectiveness. Thus, hypothesis 1b is supported. However, social interaction showed no significance on transfer effectiveness (model 3: *F*-value 2.47 at $p < 0.05$ and adjusted $R^2$ 0.05). In line with the prediction for hypothesis 2b, model 4 (*F*-value 12.01 at $p < 0.001$ and adjusted $R^2$ 0.36) showed that social interaction used to overcome contextual transfer barriers will have a positive effect on the transfer effectiveness indicating that social interaction is an effective tool when considering the transfer effectiveness. Consequently, hypothesis 2b is supported.

## Qualitative Analysis

We analyzed qualitative data in order to construct an illustration case to understand how social interaction helps companies to ease the contextual barriers hindering the innovation transfer. We coded the interviews based on the key constructs, and presented in Fig. 4.1.

HG is a world leading iron powder producer based in Sweden. It entered China and formed a wholly own sales subsidiary in the late 1990s. As Chinese automotive industry was taking off after China's accession to WTO in 2001, HG realized that China has become an important market for automobile globally, and established an R&D centered in Shanghai (C-R&D) in 2005. While some of the customers from HG are foreign-owned, most of them are purely local and they need assistance applying iron powder in producing auto parts and components.

HG's C-R&D is designed to assist customers with know-how on applying iron powder to accommodate the demand from automakers to localize the auto supply chain. C-R&D is equipped with a metallography lab similar to its other R&D facilities in Sweden and the United States. The aim of C-R&D is mainly to support and educate local customers through organizing powder metallurgy school, specific training programs, and workshops. Approximately 180 people attend these training courses annually. Even though automotive industry is not a small community in China, HG is well known.

In addition, C-R&D center worked with customers during product development stage, which could extend over a period of three to four years in

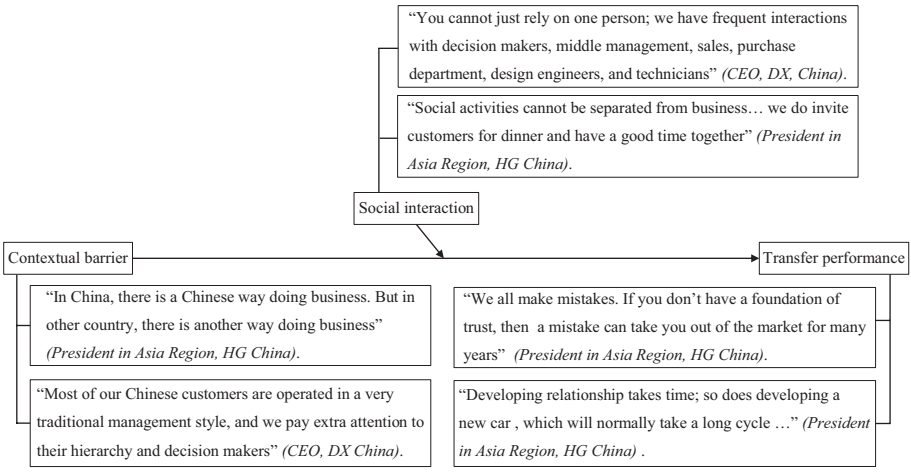


**Fig. 4.1** Results of qualitative data

automotive industry. During this period, HG, C-R&D, and customer like DX, and possibly end customer (e.g., automaker) interacted frequently. These interactions contain both business and social components, and people from multiple fields, such as R&D, production, sales and commercial side, and management all work in parallel. For HG, it is important to broader contacts with customers so that not all the relationship is dependent on one person.

Both HG and DX consider that business culture in China, technical requirement, and market demand are quite different from elsewhere. These differences can hinder the communications between various actors, and affect the process of sharing knowledge and transferring technology. Social interactions can help to ease these differences, but it will take time and effort for a company to prove trusting relationship to the customer.

## Discussion

The findings from our quantitative and qualitative data seem to point out a consistent theme—contextual barriers indeed influence the performance of transfer in terms of efficiency (cost and speed) and effectiveness (implementation and adaptation). While social interaction can help MNCs overcome the presence of the contextual barriers and improve the effectiveness of transfer, it does not address the issue of transfer efficiency. These results show support to most of our hypotheses (H1a, H1b, H2b), and we believe the rejection to H2a is not entirely surprising.

As social capital will take time and resource to accumulate, multiple social interactions may be needed. Social interactions like team meetings, workshops, and temporary or permanent task forces can be costly, and they may need to be repeated again and again to achieve a certain effect (Maurer et al. 2011). In other words, social interactions will not be a quick fix if it is going to be done properly to create social capital (Oh et al. 2004). The interview data of our focal case firm, HG, also shows the same pattern. Social interactions should be taken as a long-term strategic solution with the aim to establish mutual exchange relationship between parties.

Contextual barriers are shown to have an impact on both transfer performance and they deserve more attention from management scholars. MNCs do not exist in a vacuum, and they are very much subject to the institutional norm and culture tradition of the countries where units are located (Kostova et al. 2008). Despite the knowledge based view suggesting the reason for MNCs' existence is because their capability to share knowledge across borders efficiently (Kogut and Zander 1993), MNCs cannot escape the influ-

ence from the external environment on their internal actions (Forsgren 1997).

Our findings also suggest that a balanced view is needed when it comes to quality of transfer, and transfer cost and speed. Like in most of the management issues, it might be very tricky to strive for high-quality result on the one hand, and fast speed and low cost on the other hand. Therefore, how to achieve a balance is a strategic challenge. An occasion to prioritize quality over cost and speed could be when the knowledge in question is novel and unique, and then it may worthwhile for MNCs to make sure the transfer is done properly.

## Concluding Remark, Future Research and Application to Managers

Contextual barriers play an important role in influencing knowledge sharing and innovation transfer within MNCs and as well as between partners. Our findings support past studies that social interactions between sending and receiving units help achieve transfer effectiveness when contextual barriers are presented, but has no effect on transfer efficiency. Our studies contribute to the ongoing discussion on the facilitating effect of social interactions in knowledge sharing process (Gupta and Govindarajan 2000; Björkman et al. 2004; Maurer et al. 2011; Noorderhaven and Harzing 2009).

For managers in control of knowledge sharing process, our studies suggest that social interactions are valuable to assimilating knowledge particularly when sending and receiving units are located in very different countries. Yet, these social interactions are costly endeavor. Therefore, the question arises "Is the knowledge being transferred worth its cost?" Hence, the identification of those novel and unique knowledge or technology becomes part of the strategic decision to transfer implementation.

Future studies may want to examine and identify appropriate type of social interactions in relating to contextual barriers, as well as characteristic of knowledge and technology. There may be a combination of social interactions, contextual barriers, and type of knowledge that can maximize both transfer effectiveness and efficiency. Additionally, with digital communication technology being advanced significantly, face-to-face interactions do not necessarily have to take place in person. Would a virtual task team constitute the social interactions needed to accumulate social capital? Future research can explore the alternatives for social interactions and how they can assist in knowledge sharing process.

# Appendix: Dependent, Independent, Moderation, and Control Variables

| Dependent variables | Operationalization (indicator) | Question(s) in the questionnaire | Cronbach's alpha |
|---|---|---|---|
| Transfer efficiency | Cost of this particular<br>Speed of this particular transfer | The actual cost of technology transfer was higher than expected (reverse coded)<br>The speed of technology transfer was faster than expected | 0.67<br>MIC-0.39 |
| Transfer effectiveness | Quality of adaptation in this particular transfer | This receiver adopted the technology very quickly<br>This receiver adopted the technology easily | 0.73 |
| Independent variable | Operationalization (indicator) | Question(s) in the questionnaire | Cronbach's alpha |
| Contextual transfer barriers | Factors existed in sender's and receiver's environment that may influence this particular transfer | Market condition differences in sender's and receiver's countries make transfer problematic<br>Technological standard condition differences in sender's and receiver's countries make transfer problematic<br>Cultural and institutional differences in sender's and receiver's countries make transfer problematic | 0.74 |
| Moderation variable | Operationalization (indicator) | Question(s) in the questionnaire | Cronbach's alpha |
| Social interaction | Extensiveness of the communication between individuals from sending and receiving units in this particular transfer | Face-to-face meetings<br>Temporary trainings<br>Cross unit teams and project groups<br>Conferences and workshops | 0.71 |
| Control variables | Operationalization (indicator) | Question(s) in the questionnaire | Cronbach's alpha |

| Dependent variables | Operationalization (indicator) | Question(s) in the questionnaire | Cronbach's alpha |
|---|---|---|---|
| Age of relationship | | The age of relationship between your unit and the unit receiving this particular transfer | |
| Level of previous relationship | | To what extent have you previously cooperated together with this particular receiving unit? | 0.72 |
| | | To what extent have you previously shared knowledge with this particular receiving unit? | |
| | | To what extent existing routines of sharing knowledge with this particular receiving unit drove the transfer? | |
| Relevance of technology | | The technology is important to your unit | 0.77 |
| | | The technology is important to the division | |
| | | The technology is important to the whole company | |
| Tacit knowledge | | The technology is easily codified | 0.71 |
| | | The technology is rather explicit | |

## References

Adler, P. S., & Kwon, S.-W. (2002). Social capital: Prospects for a new concept. *The Academy of Management Review, 27*(1), 17–40.

Ado, A., Su, Z., & Wanjiru, R. (2016). Learning and knowledge transfer in Africa-China JVs: Interplay between informalities, culture, and social capital. *Journal of International Management, 23*(2), 166–179.

Allen, T. J. (1977). *Managing the flow of technology: Technology transfer and the dissemination of technological information within the R & D organization (Book)*.

Research Supported by the National Science Foundation. Cambridge, MA: MIT Press, 329p.

Ambos, T. C., Ambos, B., & Schlegelmilch, B. B. (2006). Learning from foreign subsidiaries: An empirical investigation of headquarters' benefits from reverse knowledge transfers. *International Business Review, 15*(3), 294–312.

Amesse, F., & Cohendet, P. (2001). Technology transfer revisited from the perspective of the knowledge-based economy. *Research Policy, 30*(9), 1459–1478.

Barner-Rasmussen, W., & Björkman, I. (2005). Surmounting interunit barriers factors associated with interunit communication intensity in the multinational corporation. *International Studies of Management & Organization, 35*(1), 28–46.

Bartlett, C. A., & Ghoshal, S. (1989). *Managing across borders: The transnational solution*. London: Hutchinson Business.

Birkinshaw, J., Bresman, H., & Nobel, R. (2010). Knowledge transfer in international acquisitions: A retrospective. *Journal of International Business Studies, 41*(1), 21–26.

Björkman, I., Barner-Rasmussen, W., & Li, L. (2004). Managing knowledge transfer in MNCs: The impact of headquarters control mechanisms. *Journal of International Business Studies, 35*(5), 443–455.

Bresman, H., Birkinshaw, J., & Nobel, R. (1999). Knowledge transfer in international acquisitions. *Journal of International Business Studies, 30*(3), 439–462.

Briggs, S. R., & Cheek, J. M. (1986). The role of factor analysis in the development and evaluation of personality scales. *Journal of Personality, 54*(1), 106–148.

Buckley, P. J., & Casson, M. (1976). *The future of the multinational enterprise*. New York: Macmillan.

Buckley, P. J., Clegg, J., & Tan, H. (2003). The art of knowledge transfer: Secondary and reverse transfer in China's telecommunications manufacturing industry. *MIR: Management International Review, 43*(2), 67–93.

Busse, C., Schleper, M. C., Niu, M., & Wagner, S. M. (2016). Supplier development for sustainability: Contextual barriers in global supply chains. *International Journal of Physical Distribution & Logistics Management, 46*(5), 442–468.

Cassell, C., & Symon, G. (2004). *Essential guide to qualitative methods in organizational research*. London: Sage.

Ciabuschi, F., Dellestrand, H., & Kappen, P. (2011). Exploring the effects of vertical and lateral mechanisms in international knowledge transfer projects. *Management International Review, 51*(2), 129–155.

Ciabuschi, F., Dellestrand, H., & Kappen, P. (2012). The good, the bad, and the ugly: Technology transfer competence, rent-seeking, and bargaining power. *Journal of World Business, 47*(4), 664–674.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly, 35*(1), 128–152.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Los Angeles/London/New Delhi/Singapore/Washington, DC: SAGE.

Dhanaraj, C., Lyles, M. A., Steensma, H. K., & Tihanyi, L. (2004). Managing tacit and explicit knowledge transfer in IJVs: The role of relational embeddedness and the impact on performance. *Journal of International Business Studies, 35*(5), 428–442. https://doi.org/10.1057/palgrave.jibs.8400098.

Dunning, J. H. (1980). Toward an eclectic theory of international production: Some empirical tests. *Journal of International Business Studies, 11*(1), 9–31.

Dyer, J. H., & Hatch, N. W. (2006). Relation-specific capabilities and barriers to knowledge transfers: Creating advantage through network relationships. *Strategic Management Journal, 27*(8), 701–719.

Eden, L., & Miller, S. R. (2004). Distance matters: Liability of foreignness, institutional distance and ownership strategy. In *Advances in international management* (Vol. 16, pp. 187–221). Bingley: Emerald.

Fishbein, M. (1963). An investigation of the relationships between beliefs about an object and the attitude toward that object. *Human Relations, 16*(3), 233–239.

Forsgren, M. (1997). The advantage paradox of the multinational corporation. In I. Bjorkman & M. Forsgren (Eds.), *The nature of the international firm: Nordic contributions to international business research* (1st ed., pp. 69–85). Copenhagen: Handelshojskolens Forlag.

Forsgren, M., Holm, U., & Johanson, J. (2006). *Managing the embedded multinational: A business network view*. Cheltenham: Edward Elgar Publishing.

Fowler, F. J. (1993). *Survey research methods* (2nd ed.). Newbury Park: Sage.

Ghoshal, S., & Bartlett, C. A. (1990). The multinational corporation as an interorganizational network. *The Academy of Management Review, 15*(4), 603–625.

Ghoshal, S., Korine, H., & Szulanski, G. (1994). Interunit communication in multinational corporations. *Management Science, 40*(1), 96–110.

Gooderham, P., Minbaeva, D. B., & Pedersen, T. (2011). Governance mechanisms for the promotion of social capital for knowledge transfer in multinational corporations. *Journal of Management Studies, 48*(1), 123–150.

Granovetter, M. (1973). The strength of weak ties. *The American Journal of Sociology, 78*(6), 1360–1380.

Granovetter, M. (1983). The strength of weak ties: A network theory revisited. *Sociological Theory, 1*, 201–233.

Gulati, R. (1995). Social structure and alliance formation patterns: A longitudinal analysis. *Administrative Science Quarterly, 40*(4), 619–652.

Gupta, A. K., & Govindarajan, V. (1994). Organizing for knowledge flows within MNCs. *International Business Review, 3*(4), 443–457.

Gupta, A. K., & Govindarajan, V. (2000). Knowledge flows within multinational corporations. *Strategic Management Journal, 21*(4), 473–496.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis* (6th ed.). Upper Saddle River: Pearson Prentice Hall.

Hansen, M. T. (1999). The search-transfer problem: The role of weak ties in sharing knowledge across organization subunits. *Administrative Science Quarterly, 44*(1), 82–111.

Hansen, M. T., Mors, M. L., & Løvås, B. (2005). Knowledge sharing in organizations: Multiple networks, multiple phases. *Academy of Management Journal, 48*(5), 776–793.

Ho, M. H.-W., Ghauri, P. N., & Larimo, J. A. (2017, July). Institutional distance and knowledge acquisition in international buyer-supplier relationships: The moderating role of trust. *Asia Pacific Journal of Management*.

Hutzschenreuter, T., & Matt, T. (2017). MNE internationalization patterns, the roles of knowledge stocks, and the portfolio of MNE subsidiaries. *Journal of International Business Studies, 48*(9), 1131–1150.

Inkpen, A. C., & Beamish, P. W. (1997). Knowledge, bargaining power, and the instability of international joint ventures. *The Academy of Management Review, 22*(1), 177–202.

Inkpen, A. C., & Tsang, E. W. K. (2005). Social capital, networks, and knowledge transfer. *Academy of Management Review, 30*(1), 146–165.

Katz, R., & Allen, T. J. (1982). Investigating the not invented here (NIH) syndrome: A look at the performance, tenure, and communication patterns of 50 R & D project groups. *R&D Management, 12*(1), 7–20.

King, N. (2004). Using interviews in qualitative research. In C. Cassell & G. Symon (Eds.), *Essential guide to qualitative methods in organizational research* (pp. 11–22). London: Sage.

Kogut, B., & Zander, U. (1993). Knowledge of the firm and the evolutionary theory of the multinational corporation. *Journal of International Business Studies, 24*(4), 625–645.

Kostova, T., & Roth, K. (2002). Adoption of an organizational practice by subsidiaries of multinational corporations: Institutional and relational effects. *The Academy of Management Journal, 45*(1), 215–233.

Kostova, T., & Roth, K. (2003). Social capital in multinational corporations and a micro-macro model of its formation. *Academy of Management Review, 28*(2), 297–317.

Kostova, T., Roth, K., & Dacin, M. T. (2008). Institutional theory in the study of multinational corporations: A critique and new directions. *Academy of Management Review, 33*(4), 994–1006.

Kvale, S. (1996). *Interviews: An introduction to qualitative research interviewing*. Thousand Oaks: Sage.

Lane, P. J., Salk, J. E., & Lyles, M. A. (2001). Absorptive capacity, learning, and performance in international joint ventures. *Strategic Management Journal, 22*(12), 1139–1161.

Lawson, B., Tyler, B., & Cousins, P. (2008). Antecedents and consequences of social capital on buyer performance improvement. *Journal of Operations Management, 26*(3), 446–460.

Lin, C., Tan, B., & Chang, S. (2008). An exploratory model of knowledge flow barriers within healthcare organizations. *Information & Management, 45*(5), 331–339.

Lynskey, M. J. (1999). The transfer of resources and competencies for developing technological capabilities-the case of Fujitsu-ICL. *Technology Analysis & Strategic Management, 11*(3), 317–336.

Mäkelä, K., Kalla, H. K., & Piekkari, R. (2007). Interpersonal similarity as a driver of knowledge sharing within multinational corporations. *International Business Review, 16*(1), 1–22.

Maurer, I., Bartsch, V., & Ebers, M. (2011). The value of intra-organizational social capital: How it fosters knowledge transfer, innovation performance, and growth. *Organization Studies, 32*(2), 157–185.

Michailova, S., & Husted, K. (2003). Knowledge-sharing hostility in Russian firms. *California Management Review, 45*(3), 59–77.

Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *The Academy of Management Review, 23*(2), 242–266.

Nelson, R., & Winter, S. (1982). *An evolutionary theory of technical change*. Cambridge, MA: Harvard.

Noorderhaven, N., & Harzing, A.-W. (2009). Knowledge-sharing and social interaction within MNEs. *Journal of International Business Studies, 40*(5), 719–741.

Oh, H., Chung, M.-H., & Labianca, G. (2004). Group social capital and group effectiveness: The role of informal socializing ties. *The Academy of Management Journal, 47*(6), 860–875.

Pérez-Nordtvedt, L., Kedia, B. L., Datta, D. K., & Rasheed, A. A. (2008). Effectiveness and efficiency of cross-border knowledge transfer: An empirical examination. *Journal of Management Studies, 45*(4), 714–744.

Phillips, N., & Tracey, P. (2009). Institutional theory and the MNC. *The Academy of Management Review, 34*(1), 169–171.

Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of Management, 12*(4), 531–544.

Polanyi, M. (1967). *The tacit dimension* (Vol. 4). London: Routledge.

Schulz, M. (2003). Pathways of relevance: Exploring inflows of knowledge into subunits of multinational corporations. *Organization Science, 14*(4), 440–459.

Silverman, D. (2010). *Doing qualitative research: A practical handbook*. London: Sage.

Simonin, B. L. (1999). Ambiguity and the process of knowledge transfer in strategic alliances. *Strategic Management Journal, 20*(7), 595–623.

Szulanski, G. (1996). Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic Management Journal, 17*(S2), 27–43.

Teece, D. J. (1977). Technology transfer by multinational firms: The resource cost of transferring technological know-how. *The Economic Journal, 87*(346), 242–261.

Vahlne, J.-E., & Johanson, J. (2017). From internationalization to evolution: The Uppsala model at 40 years. *Journal of International Business Studies, 48*(9), 1087–1102.

Xu, D., & Shenkar, O. (2002). Institutional distance and the multinational Enterprise. *The Academy of Management Review, 27*(4), 608–618.

Yeung, H. W. (1995). Qualitative personal interviews in international business research: Some lessons from a study of Hong Kong transnational corporations. *International Business Review, 4*(3), 313–339.

Yin, R. K. (2009). *Case study research: Design and methods*, *Applied social research methods* (Vol. 5, 4th ed.). Los Angeles: Sage.

Zaheer, S. (1995). Overcoming the liability of foreignness. *Academy of Management Journal, 38*(2), 341–363.

Zander, U., & Kogut, B. (1995). Knowledge and the speed of the transfer and imitation of organizational capabilities: An empirical test. *Organization Science, 6*(1), 76–92.