Learning from foreign subsidiaries: An empirical investigation of headquarters’ benefits from reverse knowledge transfers

Tina C. Ambos a,*, Björn Ambos b,1, Bodo B. Schlegelmilch b,2

a School of Management, University of Edinburgh, 50 George Square, Edinburgh EH8 9JY, UK
b Vienna University of Economics and Business Administration, International Marketing and Management, Augasse 2-6, 1090 Vienna, Austria

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Abstract

Within MNCs, the traditional role of headquarters as prime source of knowledge and competencies is changing. Increasingly, headquarters act as a receiver of knowledge from their internationally dispersed subsidiaries. But what drives the benefits headquarters can gain from such reverse knowledge transfers? Drawing on an empirical sample of 294 intra-MNC knowledge transfers, we identify the key variables impacting on headquarters’ ability to benefit from reverse knowledge transfer. Taken collectively, our findings indicate that the efficiency of the MNC as a knowledge integrating institution is being driven by changes in both, the subsidiary’s context and its capabilities to process knowledge. We discuss the implications of our analysis on the emerging knowledge based theory of the firm, draw out inferences for the strategic agenda of MNCs and suggest avenues for future research.

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Keywords: Reverse knowledge transfer; Knowledge management; Subsidiary headquarters relationship

1. Introduction

Today, the relevance of knowledge is well recognized in the management literature (cf. Conner & Prahalad, 1996; Davenport, 1998; Drucker, 1992; Grant, 1996; Kogut & Zander, 1993; Nonaka
In an international context, the importance of transferring knowledge to overseas subsidiaries has also long been emphasized (Dunning, 1958; Vernon, 1966). A series of valuable empirical contributions already focused on how to facilitate intra-organizational knowledge transfers in MNCs in general (e.g. Becerra-Fernandez & Sabherwal, 2001; Gold et al., 2001; Gupta & Govindarajan, 2000; Kogut & Zander, 1993; Tsai, 2001), or researched the characteristics of knowledge transferred (e.g. Simonin, 1999; Szulanski, 1995). However, until today, our knowledge on how firms can best ‘learn at the periphery’, i.e. benefit from subsidiaries’ knowledge (Doz & Santos, 1997) is still scarce.

In contrast to the more traditional ‘forward’ transfer (i.e. from the headquarters to the subsidiary) and the less conventional ‘lateral’ transfer (from subsidiary to subsidiary), ‘reverse knowledge transfers’, i.e. transfers from the subsidiary to the headquarters, have been explicitly investigated by very few studies (Frost, 1998; Hakanson & Nobel, 2000, 2001; Zhou & Frost, 2003). And while these studies already provided valuable insights on the determinants of reverse flows, none of these studies explicitly focused on the benefit of these flows to headquarters. This is regrettable, since reverse transfers are likely to contribute extensively to the creation of the firm’s competitive advantage as well as to our theoretical understanding of the differentiated MNC. As Zhou and Frost (2003, p. 4) observe, reverse knowledge transfers are “a realistic and perhaps even necessary ‘stepping stone’ in the evolution of the multinational toward a true distributed innovation network, one that may not necessarily involve a coordinating center.“

Building on these observations, the objective of this paper is to advance the state of our theoretical as well as empirical understanding of reverse knowledge transfers. First, we aim to provide new firm level evidence on this important issue. In addition, the paper also challenges a common assumption shared by almost all studies, namely that knowledge transferred is, per definition, beneficial for the recipient unit (cf. Doz & Santos, 1997; Jensen & Meckling, 1995). In particular, we will argue that transfer and benefit are two separate dimensions and that beneficial knowledge transfer is dependent on many other factors than mere knowledge inflows.

The paper is organized as follows. Section 2 sets out the conceptual framework for the analysis of reverse knowledge transfers and, building on that literature, advances testable research propositions. Section 3 briefly describes our data and measures. Sections 4 and 5 are followed by the analysis and discussion of the empirical results. Finally, Section 6 concludes by providing a set of specific managerial implications as well as some avenues for future research.

2. Conceptual background

2.1. The knowledge-based MNC

Over the last decades, two largely competing streams of research have dominated the discussion on why MNCs exist. Following Buckley and Casson (1976) the very existence of a MNC lies in its ability to internalize externalities by putting together resources and activities at a more efficient rate than markets do. The argument that firms create value through combining dispersed knowledge fits this perspective well, especially if one accepts that markets often fail to transfer this knowledge at a price (Caves, 1982; Hymer, 1976; Teece, 1979). Following a very different logic, Kogut and Zander (1993) come to a similar conclusion regarding the MNC as a knowledge integrating institution. Building an evolutionary theory of the firm, they state that knowledge exists in social relations among cooperating members of a community without fixed boundaries. In this school of thought, the MNC is seen as a social community, whose productive knowledge defines a competitive advantage. These assumptions fit well with the emergent
literature on transnational, heterarchical or multi-focal firms (Bartlett & Ghoshal, 1988; Forsgren, 1990; Ghoshal & Nohria, 1993; Hedlund, 1994). Rather than seeing the MNC as a result of market failures, these authors emphasize the MNCs’ ability to integrate, combine and create new knowledge. Taken collectively, both economic and capability-based theories of the MNC emphasize the role of knowledge integration as a basis for a competitive advantage, thus, providing ample justification for further, and more systematic, research in this field. In this paper, we subscribe to the view of the firm as a network of differentiated roles and responsibilities in which the access to internal and external knowledge networks enables it to continuously create and renew its competitive advantage (Nohria & Ghoshal, 1997).

2.2. Reverse knowledge transfers and their benefits

In the early stages of research on the internationalization of firms, authors (e.g. Vernon, 1966) emphasized that the international exploitation of MNCs’ competitive advantage was aimed at host country markets and, thus, involved knowledge transfers from the headquarters to the subsidiary. In attempting to exploit this knowledge, firms typically bounded their knowledge management task by limiting the type of knowledge they integrated across borders and the range of locations between which knowledge has to be combined (Doz & Santos, 1997). This, of course, restricted the connectivity and knowledge process capabilities of individual organizational units, but enabled efficient coordination and control of dispersed units. The strategic importance of this phenomenon has led to a multitude of theoretical as well as empirical investigations of these ‘forward’ knowledge transfers (Patel & Pavitt, 1992; Vernon, 1966). However, as Doz and Santos (1997, p. 4) argue “leveraging internationally the know-how advantages derived from a home country competence cluster is no longer sufficient to underpin competitive advantage unless the home base remains the only crucible of new technologies, competencies and leading customers.” As knowledge creation gets more dispersed, the assumption of home-base supremacy holds true for fewer and fewer companies. Subsidiaries tap domestic sources of knowledge which have to be diffused and exploited within the MNC (Foss & Pedersen, 2002; Hakanson & Nobel, 2001) in order to sustain a competitive advantage. Despite the recognition that subsidiaries interact with their local environment (Almeida, 1996; Frost, 2001; Porter, 1990) and exchange knowledge on this level, the MNC-internal dissemination of subsidiaries’ knowledge stock has only rarely been investigated systematically (Hakanson & Nobel, 2001). And while there seems to be an emerging interest in the investigation of lateral knowledge transfer between subsidiaries (e.g. Ghoshal, Korine, & Szulanski, 1994; Nohria & Ghoshal, 1997), the reversed direction of hierarchical knowledge flows (between headquarters and subsidiaries) has rarely been considered. An investigation of this specific direction of knowledge flow is warranted in order to understand which types of knowledge provided by subsidiaries are most beneficial to headquarters.

The assumption that knowledge flows are beneficial has been implicit in most studies (e.g. Becerra-Fernandez & Sabherwal, 2001; Gold et al., 2001; Gupta & Govindarajan, 2000; Kogut & Zander, 1993; Tsai, 2001). However, it is likely that not every knowledge flow will be equally beneficial to the recipient. Some units might receive a lot of knowledge, but, for one reason or the other, this knowledge may not translate into an improvement of their operations. Others might receive only little inflows, but benefit greatly. In this paper we will deconstruct knowledge transfers and distinguish inflows from benefit. Headquarters can benefit from their subsidiary knowledge in various ways: Local knowledge can help headquarters to fine-tune and coordinate a global strategy, improve processes in their own or other units in the network, or simply provide the missing link in the quest to develop a new product. It might stem from different knowledge
domains, e.g. marketing, purchasing or technology. In this paper we take an aggregate view on headquarters’ benefits. We define benefit as the overall value of a knowledge transfer as perceived by headquarters. With this definition, we intend to capture benefit in its most holistic way: through the eyes of the beneficiary of this knowledge.

Analogous to other knowledge flows in the MNC, the creation of value through combination of dispersed knowledge conceptually builds on three assumptions: (1) There is a (potentially valuable) stock of knowledge in organizational entities inside the firm. (2) This localized knowledge is amenable to transfer, i.e. knowledge needs to flow to other parts of the organizational network. (3) Finally, the firm has to develop certain capabilities to benefit from the pieces of knowledge and thus ultimately create value.

While we will relate back to these theoretical underpinnings in the successive section, the nature of knowledge and its transfer deserves a brief reflection. In line with the resource based-view, we argue that knowledge is the MNC’s primary resource and include procedural (know-how) and declarative (know-what) knowledge into our study (see also Becerra-Fernandez & Sabherwal, 2001; Gupta & Govindarajan, 2000; Kogut & Zander, 1993; Simonin, 1999). Moreover, the investigation of knowledge transfers between dispersed settings has led to the recognition that the transfer of knowledge does not imply a ‘full’ replication of knowledge in a new location (cf. Doz & Santos, 1997). Indeed, ‘transfer of knowledge is often associated with modification of the existing knowledge to the specific context’ (Foss & Pedersen, 2002, p. 54).

2.3. Hypotheses

Knowledge flows within a MNC may be best understood from a source–target perspective (Mudambi, 2002). In our case, where we are concerned with flows from the subsidiary to the headquarters, such a nodal and dyadic perspective is valuable to structure our ideas. Beginning with the context of the source unit, we will subsequently develop four propositions regarding benefits from reverse knowledge transfers. We will first elaborate on the subsidiaries’ geographic location as a potential source of value (Foss & Pedersen, 2002; Frost, 2001; Sölvell & Zander, 1995) before turning to the subsidiaries’ own role and strategic position in the MNC network (Ambos, 2002; Gupta & Govindarajan, 2000; Hansen, 1999; Tsai, 2001). Acknowledging that not every target unit will be able to benefit equally in this process, we introduce the headquarters’ absorptive capacity as a final contingency (Cohen & Levinthal, 1990) after discussing the impact of cultural and organizational distance as two prominent impediments (noise in the transmission) of international knowledge transfers (cf. Asakawa, 1995; Bhagat et al., 2002).

2.3.1. Source country competitive strength

As countries strive for higher economic development, they build up more sophisticated resource endowments (Gupta & Govindarajan, 2000; Porter, 1990). In terms of knowledge flows, this usually implies transfers from the more developed nation to the less developed nation (e.g. Gupta & Govindarajan, 2000). While this flow is probably the most widely researched and supported inside the international business domain, knowledge flows are equally common among industrialized nations. Porter (1990) and many others (Cantwell & Janne, 1999; Chiesa, 1996; Krugman, 1990; Kuemmerle, 1999) show that knowledge often resides in highly specialized industry clusters. Knowledge originating from subsidiaries located in these ‘pockets of innovation’ will contribute to enhanced corporate capabilities. Thus, we would expect the host countries’ economic development to impact on the benefit from the knowledge transferred. Or,
more specifically, among highly developed nations, knowledge from subsidiaries residing in host countries that have a high competitive strength will be most beneficial. Thus:

**H1.** Headquarters’ benefits from reverse knowledge transfers will be positively related to the competitive strength of the host country.

### 2.3.2. Subsidiary role

Viewing the MNC as a differentiated network of roles and responsibilities also implies that network actors (subsidiaries) fulfill very different tasks. While some subsidiaries are mandated to contribute to the MNC by generating and disseminating new knowledge, others may primarily aim to implement or exploit headquarters’ knowledge in the local context (Asakawa, 2001; Birkshaw, 2002; Gupta & Govindarajan, 1991; Kuemmerle, 1997). Consequently, it can be assumed that headquarters’ benefit from local knowledge will depend on the role of the subsidiary. Focusing explicitly on knowledge flows, Gupta and Govindarajan (1991, 1994) propose four strategic roles: Integrated Players, Global Innovators, Implementers and Local Innovators. Viewed from a network perspective, integrated players should possess the most valuable knowledge resources. Characterized by high inflows and outflows of knowledge, they serve as ‘knowledge brokers’ (Burt, 1992, 1997) or ‘regional innovation relays’ that span structural holes between local units and global headquarters (Asakawa, 2001; Asakawa & Lehrer, 2003). Thus, knowledge benefits associated with the inflow of knowledge from integrated players are expected to be highest. Similarly, global innovators contribute extensively to the knowledge base of the firm. Generating knowledge of high value for the MNC, they heavily engage in intra-firm knowledge transfers (Gupta & Govindarajan, 1991). Thus, given their strategic task, we assume this knowledge to be almost equally beneficial for headquarters. In contrast, implementers are charged with a clear role to implement corporate strategy. Knowledge is seldom transferred back to corporate headquarters, and we expect the benefits of such transfers also to be relatively low. Finally, Gupta and Govindarajan (1991) define local innovators as units dealing with idiosyncratic knowledge resources. As the term already implies, this knowledge is most likely not very beneficial for headquarters. Building on this reasoning, we advance the following hypothesis:

**H2.** Headquarters’ benefits from reverse knowledge transfers will depend on the strategic role of the source unit (subsidiary). Compared to local innovators and implementers, the benefits of reverse knowledge transfers are expected to be highest for integrated players and global innovators.

### 2.3.3. Context similarities

Doz and Santos (1997) argue that in MNCs, knowledge management becomes ‘eventful’ because of the dispersion in space and time and differentiation of context. Capability-based theories and product innovation literature hypothesize that a higher degree of interaction between units leads to more familiarity, and subsequently to a better understanding of the knowledge transferred (Subramaniam & Venkatraman, 2001). A lack of context similarities requires knowledge to be transformed so that it conforms to existing expectations (Tenkasi, 2000). Thus, without putting explicit efforts into such a transformation, the likelihood of correctly understanding and subsequently benefiting from distant knowledge sources might be lower.

In this paper, we conceptualize the context dissimilarities in terms of organizational and cultural misfit and hypothesize that both, cultural and organizational distance, will have a negative effect on headquarters’ benefits from reverse knowledge transfers. Specifically, we view organizational distance as the difference between organizational units (i.e. in our context
between headquarters and subsidiaries) in terms of structures, processes and values. Asakawa (1995) suggests that institutional isomorphism has a strong impact on a local unit’s approach to structure knowledge. Moreover, we link cultural distance to the benefit from reverse knowledge transfers, arguing that the reception of knowledge from another cultural context is likely to be easier when the system of underlying conventions fits the system of meaning of those expected to implement these procedures (Macharzina, Oesterle, & Brodel, 2001). Thus:

H3a. Headquarters’ benefits of reverse knowledge transfers will be negatively related to the organizational distance between the subsidiary and the headquarters.

H3b. Headquarters’ benefits of reverse knowledge transfers will be negatively related to the cultural distance between the subsidiary and the headquarters.

So far, we only considered factors related to the specific characteristics of the subsidiary as a source unit. As stated by Cohen and Levinthal (1990), Gupta and Govindarajan (2000) and Tsai (2001), the absorptive capacity of the target unit might have a bearing on the benefits as well.

2.3.4. Absorptive capacity

According to Gupta and Govindarajan (2000), a target unit’s capacity to absorb incoming knowledge is a prime factor in determining knowledge inflows. We aim to extend this notion to the potential benefits of the transferred knowledge. Cohen and Levinthal (1990) define absorptive capacity as the ability to use prior knowledge to recognize the value of new information, assimilate it, and apply it to create new knowledge and capabilities. Moreover, absorptive capacity can also be seen as a firm’s ability to deal with the tacit component of transferred knowledge (Mowery & Oxley, 1995).

Each node of the MNC network possesses a certain knowledge stock, which has to be non-duplicative and useful for other units’ purposes (Gupta & Govindarajan, 2000) in order to benefit the recipient. If prior knowledge in a certain area exists in the target unit (headquarters), managers will find it easier to understand and apply incoming knowledge. Thus, it could be less problematic to integrate knowledge. Moreover, the recipient (i.e. the headquarters) will also be able to assess the value of knowledge more critically, as managers are more familiar with the topic. We follow the argument of Zahra and George (2002), who point out that complementarity of knowledge is essential. Thus, to be beneficial, incoming knowledge has to be related to but also different from the unit’s existing knowledge.

Headquarters will vary in terms of absorptive capacity because of the differences in prior related knowledge and because of the extent of inter-unit homophily of the receiving vis-à-vis the sending unit (Gupta & Govindarajan, 2000). Consequently, benefits resulting from reverse knowledge transfers will vary as well. In general, we assume that the higher the absorptive capacity of the target unit (headquarters), the higher the potential benefit. Building on this line of reasoning, we propose the following.

H4. Headquarters’ benefits from reverse knowledge transfers will be positively related to its absorptive capacity.

3. Methodology

3.1. Sample and data gathering

Our sample consists of 294 knowledge transfers of 66 overseas subsidiaries to their respective headquarters. The subsidiaries belong to 33 MNCs headquartered in Europe. The European Top 500 served as a sample frame. To ensure variety, both in terms of subsidiaries and industries
involved, we restricted our sampling efforts to those firms known to operate at least six overseas subsidiaries (Vernon, 1966), while using direct proportional strata on 10 industries to ensure industry variety. Because of resource limitations, an initial target sample of 60 MNCs was set. Data collection started in May 2002. Firms within each strata were contacted in descending order. Whenever a company declined to cooperate in the survey, the next largest company in terms of turnover was approached. Starting with the largest corporations, senior managers from the headquarters were contacted by phone and asked to cooperate. Upon agreement, a standardized questionnaire was mailed out. Despite their initial agreement, and two rounds of follow up calls, 27 MNCs did not provide sufficient data by October 2002, the time we finished data collection. The final sample involved leading MNCs representing such diverse industries as manufacturing (54.5%), finance and insurance (21.2%), services (including consultancies) (11.1%), trade (8.1%) transport and warehousing (6.1%). Eighty-seven percent of the respondents filled in the questionnaire personally, whereas 13% delegated it to a their subordinates, usually at the director’s level. Thus, the key-informant approach can be judged successful. As many other empirical studies (e.g. Ghoshal & Nohira, 1989; Nobel & Birkinshaw, 1998; Roth, Schweiger, & Morrison, 1991), we have to acknowledge the potential of a common method bias. To assess common method bias in our sample, we used Harman’s one-factor test (Podsakoff & Organ, 1986). The factor analysis of the variables used in the regression modes revealed four factors with eigenvalues greater than 1, with no sign of a ‘general’ factor explaining a disproportional large share of the common variance. This result indicates that common method bias is not a serious problem. On average, managers reported on 4.45 individual knowledge transfers per subsidiary. The geographical distribution of subsidiaries is shown in Table 1.

3.2. Operationalization of variables

The questionnaire was designed to measure various determinants of headquarters’ perceived benefits from subsidiary knowledge. Data were obtained on the strategic role of the subsidiary, the type, amount and benefits from knowledge transferred, the perceived cultural distance between headquarters and the respective subsidiary, and the absorptive capacity of headquarters. Additionally, information on the competitive position of the source country was obtained using secondary data. Whenever feasible, we used measures which have been applied in major previous studies. Individual variables were measured as follows:

3.2.1. Benefits from subsidiary knowledge

To estimate the benefits from subsidiary knowledge, we followed the following procedure. First, we assessed the different types of knowledge which were reverse transferred. This was achieved by asking managers to indicate, whether their operations had received any inflow of knowledge from specific subsidiaries. We followed Gupta and Govindarajan’s (1994) approach and distinguished six different types of knowledge: (1) market data on customers; (2) market data on competitors; (3) marketing know-how; (4) distribution know-how; (5) technology know-how and (6) purchasing know-how. The measures ranged from ‘not at all’ to ‘a very great deal’ on a seven point scale. Similarly, in a different section of the questionnaire, we addressed the issue of how the headquarters’ operations had benefited from the knowledge of the local subsidiary, using the same dimensions: ‘Headquarters’ operations have benefited greatly from the transfer of …’ to be assessed on a seven point scale ranging from ‘I strongly disagree’ to ‘I
strongly agree’. This question aimed at the actual value of the knowledge transferred for the recipient, i.e. the headquarters.\(^3\)

### 3.2.2. Subsidiary roles

Following Gupta and Govindarajan (1991, 1994), we operationalized the subsidiary role as a product of knowledge outflows and knowledge inflows. Knowledge flows were assessed on a six-item instrument adapted from Gupta and Govindarajan (1994, 2000). Taking the overall knowledge inflow and outflow over all knowledge types, we derived the four subsidiary roles discussed previously by using median splits along these two composite measures. Consistent with Gupta and Govindarajan (1994, p. 450), the resulting four types were termed ‘global innovators’, ‘integrated players’, ‘implementers’ and ‘local innovators’.

### 3.2.3. Source country competitive strength

Given the diverse set of countries included in our sample, sophisticated competitiveness measures were not available for all countries. For this reason, we finally used a rather crude measure in the analysis but also applied more fine-grained procedures. Relying on the

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\(^3\) On definitional grounds, we assumed that benefits would only preside in areas where knowledge was transferred in the first place and learning had occurred. A cross-tabulation of the relevant variables confirmed this notion, as areas where no knowledge was transferred were judged to be non-beneficial or left blank altogether. For further analysis, we subsequently decided to exclude these cases and focus on benefits of actual knowledge transfers only.
assumption that knowledge is more beneficial when transferred from economically more developed to less developed countries, we differentiate between G7 countries versus the rest of the world. To control for the validity of this measure, two robustness checks were used. First, to model differences between highly developed countries, the World Competitiveness Index (IMD, 2002) was used. A dummy variable was introduced, denoting those cases where the source country ranked higher than the headquarters’ home country in terms of competitiveness. Second, acknowledging that competitiveness usually resides at the industry level (Porter, 1990), we established a revealed competitive advantage measure by calculating the difference between industry-specific exports of the source country and industry specific exports of the home country, normalized by industry-specific world exports (Kuemmerle, 1999). Export figures were drawn from the relevant OECD Trade Statistics (OECD, 2001). As this detailed data was available only for the manufacturing sector in our OECD sub-sample, this measure only serves as a robustness check.

3.2.4. Context similarities
Following our theoretical reasoning above, context similarities were operationalized along two dimensions: organizational distance and cultural distance. In measuring the former, a two item scale, capturing the degree of dissimilarity between the partners’ business practices, institutional heritage, and organizational culture was used. Items were adopted from Simonin (1999): “Generally, business practices and operational mechanisms are very similar.” “Generally, corporate culture and management style are very similar.” Both questions were answered on a seven-point scale ranging from ‘I strongly disagree’ to ‘I strongly agree’.

Given the controversy regarding cultural distance measures (Shenkar, 2001; Stöttinger & Schlegelmilch, 1998), we opted for a dual strategy. Following many authors in the field (Ambos & Schlegelmilch, 2004; Hakanson & Nobel, 2001; Harzing, 1999; Hennart & Larimo, 1998), we utilized Kogut and Singh’s (1988) cultural distance index. Second, taking into account of Shenkar’s (2001) and Au’s (2000) critique, we measured perceived cultural distance. Specifically, headquarters managers were asked to indicate whether they perceive the subsidiaries as culturally close or distant. This classification was subsequently coded as 0 and 1 to be used in the analysis.

3.2.5. Absorptive capacity
Headquarters’ absorptive capacity was assessed as a function of the unit’s familiarity with the incoming knowledge (Gupta & Govindarajan, 2000). To this end, we decided to directly assess headquarters’ prior knowledge by asking: “Generally, compared to all your subsidiaries, the headquarters’ knowledge stock in the following area is...”. The areas distinguish between different knowledge types and were measured on a 7-point Likert scale ranging from ‘much lower’ to ‘much higher’.

3.2.6. Industry
Industry specific contingencies are likely to have an impact on knowledge transfer practices within a firm. Sector specific studies focussing on technology-based industries like semiconductors and pharmaceuticals (Almeida, 1996; Crioscuolo, 2003), or service-based industries (Grosse, 1996; Lathi & Beyerlein, 2000) produced varying results. Thus, in line with Gates and Egelhoff (1986), Gupta and Govindarajan (2000), Jacob and Ebrahimpur (2001), Kuemmerle (1999) and Subraminam and Venkatraman (2001), we deemed it important to control for industry effects as well. As a result of the sampling procedure, five digit NAICS
industry codes were available for all sampled firms. For further analysis, industries were aggregated and dummy coded as ‘1’ for manufacturing and ‘0’ for all service industries.

4. Results

Initially, we investigated to what degree subsidiaries actually engaged in reverse knowledge transfers. Our results indicate that almost all subsidiaries engaged at least in some kind of knowledge transfer, although the intensity varied considerably. To gain a more detailed representation of what kind of knowledge was transferred, we computed the means of knowledge inflows and benefit separating different types of knowledge (Table 2). It appears that the occurrence of knowledge flows does by no means equal the benefit generated for the recipient. Especially striking is the fact that headquarters seem to benefit most from the type of knowledge they get least. Marketing know-how is the most frequently transferred knowledge, followed by distribution know-how and technological know-how. Market data on customers and market data on competitors, in turn, were transferred less frequently, but generated more benefit for the recipient. This preliminary analysis strengthens our theoretical considerations that it is important to investigate the ‘benefit from reverse knowledge transfers’ instead of focusing on the existence of knowledge flows.

Addressing the core issue of this paper, we then turned to estimating the benefits of reverse knowledge transfers. Hypotheses were tested using a series of multivariate OLS regressions. Data were carefully examined with respect to linearity, equality of variance and normality by plotting standardized residuals against predicted values. No serious deviations were detected. Data were also carefully examined for multicollinearity among our independent variables. Zero-order correlations revealed a relatively high correlation (0.510) among our two context similarity measures, cultural distance and organizational distance, and between Integrated Player and Implementer (0.580) (see Table 3). A detailed examination of tolerance and VIF ensured that multicollinearity was not an issue. The highest VIF value in our model is 4.469 for Integrated Player, well below the usual threshold of 10 (Hair, Anderson, Tatham, & Black, 1998 and Wooldridge, 2003). The VIF scores are also shown in Table 4.

Due to the fact that all knowledge transfers occurred within one of 33 MNCs our study potentially suffers from non-independent error terms, thus violating an assumption of OLS regression. To assess the potential impact of firm effects, we examined the MNCs’ variance across our dependent variable. This analysis showed that almost all MNCs exhibit considerable

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4 While including firm dummies for all 33 MNC would have been desirable, high correlations between firm dummies and our industry measure made this procedure infeasible. For similar reasons, the use of a fixed effect model had to be ruled out.
variance. Only three cases (firms) raised suspicion, i.e. lacked within firm variance. However, rerunning our regression without these cases, as well as controlling directly for correlations of standard errors using STATA 8 software did not significantly change our results. We also computed a model using only the first knowledge transfer per company avoiding the caveats of high correlations between dummy variables and circumventing the potential problem of non-independent error terms. The model results show almost identical signs and significance level as the full model and thus confirm the robustness of our results (see Appendix). These observations suggest that firm effects are unlikely to impact our model and that OLS regression is the appropriate method of analysis.

Table 3
Mean, median, standard deviation and correlations of all independent variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>s.d.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<tbody>
<tr>
<td>1. Economic development</td>
<td>.45</td>
<td>.00</td>
<td>.498</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2. Implementer</td>
<td>.38</td>
<td>.00</td>
<td>.485</td>
<td>.203*** 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3. Global innovator</td>
<td>.02</td>
<td>.00</td>
<td>.124</td>
<td>-.115** -.098* 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4. Integrated player</td>
<td>.36</td>
<td>.00</td>
<td>.480</td>
<td>-.158*** .580*** -.094* 1</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>5. Absorptive capacity</td>
<td>4.63</td>
<td>5.00</td>
<td>1.572</td>
<td>.099* .098* .024 .057 1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>6. Perceived cultural distance</td>
<td>.50</td>
<td>1.00</td>
<td>.501</td>
<td>.282*** .194*** .126** -.358*** .000 1</td>
<td></td>
<td></td>
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<tr>
<td>7. Organizational distance</td>
<td>9.16</td>
<td>10.00</td>
<td>3.228</td>
<td>-.284*** -.065 -.099 .281*** .164*** -.510*** 1</td>
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</tbody>
</table>

*p<0.1; **p<0.05; *** p<0.01.

Table 4
Regression model

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>VIF</th>
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<tbody>
<tr>
<td>Industry</td>
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<tr>
<td>Economic development</td>
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<td>Implementer</td>
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<td>Global innovator</td>
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<td>Integrated player</td>
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<td>Absorptive capacity</td>
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<tr>
<td>Perceived cultural distance</td>
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<td>Organizational distance</td>
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</table>

Model statistics

| R Square                       | 0.171|
| Adj. R Square                  | 0.145|
| F-Score                        | 6.548|
| Sign                           | 0.000|

*p<0.1; **p<0.05; *** p<0.01, Local innovators were used as a baseline. Dependent variable: benefits of reverse knowledge transfers
The regression model is presented in Table 4. The model presents the overall results controlling only for industry type and using the perceived cultural distance measure. Dummies were created for the four subsidiary roles with local innovators serving as the baseline.

Turning to our four hypotheses, the results reveal a consistent, albeit only partially supportive pattern. Overall, three hypotheses are supported (H1, H2 and H4), while no support is found regarding the remaining hypothesis (H3). In the following, we will discuss the results relating to each hypothesis in turn.

In the conceptual part of this paper, we proposed that subsidiaries’ strategic role will influence the benefit from the knowledge transferred. Overall, it was assumed that due to their role, integrated players and global innovators possess more valuable knowledge, and consequently headquarters would benefit more from these inflows than from local innovators and implementers. Our results clearly confirm this pattern. Using local innovators as a baseline, our regression shows that integrated players, as predicted, provide significantly higher benefit for headquarters. However, we could not detect a significant effect for global innovators. While we will outline the implications of our findings in more depth in the discussion section, we take the high and significant results regarding integrated players as support for our Hypothesis 2.

Similarly, strong support was found concerning our Hypothesis 4, predicting that headquarters’ absorptive capacity will be positively related to the benefits of the knowledge transferred. In all models, absorptive capacity oscillates around the $p<0.05$ threshold. We see this as a support for our Hypothesis 4.

Knowledge transfers were assumed to be more beneficial when the source unit’s country possesses a higher competitive strength than the target country. Using the distinction between G7 countries and others as a proxi, we obtained support for this notion. In all models, standardized betas are positive and significant, thus confirming the positive impact. Given the operationalization used, these results provide support for our Hypothesis 1. Using the World Competitiveness Index (not reported here) did not alter results much. However, significance levels barely reached the $p>0.15$ threshold. The more sophisticated measure of the revealed competitive advantage, which was applied for the manufacturing subsample in order to check robustness, led to similar results only marginally supporting our hypothesis.

Finally, following the literature on cross-border knowledge transfers (Inkpen & Dinur, 1998; Morosini, 1998; Quintas, 2001), it was assumed that cultural and organizational distance will influence the benefit from knowledge transfers negatively. Our data do not confirm this pattern. Cultural as well as organizational distance failed to reach significance. These results stayed robust even when we excluded one of the two measures in turn, or used Kogut and Singh’s cultural distance measure instead. However, it is interesting to observe that bivariate results suggest a negative relationship between cultural distance and the benefit from knowledge transfers. The correlation coefficients are $-0.136$ for the perceptual measure and $-0.218$ for Kogut and Singh’s index (both significant at $p<0.05$). Thus, the general verdict

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5 Rerunning the regression by using Kogut and Singh’s cultural distance index instead of the perceived cultural distance measure did not change our results. Thus, we only report on the models using the perceived cultural distance measure.
for H3 is still outstanding and further research on the role of cultural and organizational distance is needed.

5. Discussion

Arguably, a striking aspect of our empirical investigation is that the quantity of knowledge inflows is by no means equal to the benefit. Headquarters in our sample seem to benefit most from what they get least. In general, our descriptive statistics show that the quantity of knowledge flows differs from their respective qualitative benefits. This supports our reservations about merely measuring intensity to assess knowledge transfer and indicates that research has to consider the value of knowledge transferred.

The MNCs industry, our control variable, does not seem to have an impact on the benefits of knowledge transfer. Thus, the drivers determining the benefits headquarters perceive from reverse knowledge transfers appear to be independent of the type of industry involved.

Probably, the least surprising result is that knowledge within a MNC is primarily transferred from higher developed local knowledge bases to less developed countries. This permits the exploitation of competitive advantages in transition economies. Our results (H1) show that this also holds true in cases of reverse knowledge transfers. Thus, headquarters profit more from their subsidiaries in highly developed ‘lead’ countries than from those which are lagging behind. Interestingly, our two alternative—and supposedly more fine-grained measures—do not improve but rather weaken our findings. Possibly, the indices are still too coarse-grained to capture the effects of industry competitiveness.

Of our results, the strong impact of the subsidiaries’ strategic role is probably most striking. Our data demonstrates that from a headquarters’ view, knowledge received from integrated players is most valuable. In this respect, our results add to the recent literature on centers of excellence, corporate leaders, and regional innovation relays (Asakawa & Lehrer, 2003; Holm & Pedersen, 2000; Moore & Birkinshaw, 1998). As most authors analyze knowledge inflows, not benefits, our results extend the support for these findings on a higher level. Moreover, Nahapiet and Ghoshal (1998) highlight the importance of social capital. They argue that social capital facilitates knowledge transfer and accounts for the firms’ combinative capability. Our findings are well in line with such a view, as they show that those units which are deeply integrated in the MNC network, i.e. exhibit high inflows and high outflows, contribute significantly more to headquarters’ benefits. The lack of integration in the MNC network could explain why global innovators do not contribute significantly to headquarters’ benefit.

Our findings also confirm that the headquarters’ absorptive capacity significantly impacts the benefits from this knowledge. The higher the headquarters’ capacity to absorb new knowledge, the higher the benefits of a reverse knowledge transfer. This result is of some practical relevance, as it demonstrates that not all attempts to source local knowledge might be successful. Headquarters lacking the capability to understand local knowledge will not benefit. This argument is in line with the complementarity of knowledge proposed by Zahra and George (2002).

Surprisingly, we find no significant relationships with respect to our two measures of context similarity (cultural and organizational distance) (H3), and our two control variables industry and knowledge type (except the previously discussed competitor and customer data). Although the impact of cultural differences has long been highlighted in the knowledge management literature
neither cultural nor organizational distance seems to have an impact in our study. Recent research, using secondary data, seems to mirror our results. For example, Zhou and Frost (2003) did not find any support for an impact of cultural distance in their study either. At this stage, we can only speculate why. It is plausible that with respect to context similarities, two contravening forces are at work. In line with our hypothesis, it is reasonable to assume that this knowledge will also be harder to transfer. In contrast, the network school (cf. Granovetter, 1973), argues that units with weak network ties, which are not in regular contact with the rest of the organization, operate in a different context and, thus, are able to introduce new knowledge. To this end, they are viewed as an important source of innovation. This could explain why we were not able to see any effects at the bottom line. However, when it comes to transfers of complex knowledge that tends to be characterized by a high degree of tacitness, the instrumental benefits of weak ties are called into question (Hansen, 1999). Thus, to shed more light on this issue, the different characteristics of the knowledge transferred have to be investigated in relation to the network ties.

All our findings show that reverse knowledge transfers in MNCs are, indeed, beneficial to headquarters. However, it might not always be easy to transfer this insight into practice. Following Doz and Santos (1997, p. 12): “Perhaps even more critically, this flow reversal seems difficult to accomplish once the MNC has matured into a set pattern of relationships, typically with a strong centre which muffles peripheral voices or with autonomous dispersed units which become increasingly self-sufficient.”

5.1. Limitations

To a large extent our research has been exploratory. New concepts are introduced and operationalized; several of the variables are measured with single item indicators and the size and type of data available did not allow us to control for a whole set of co-founding factors. Thus, it might be advisable to regard the empirical results more as an illustration of theoretical ideas than a full-blown effort to rigid hypothesis testing. Nevertheless, the results presented are robust across models and offer some important new insights. We are confident that they will encourage future studies that develop more elaborate scales and gather more comprehensive data. Such efforts could, for example, aim for larger datasets to increase the statistical power in order to detect smaller and medium size effects (Cohen, 1982), while simultaneously obtaining data from both sides of the dyad: senders and recipients.

With all observations stemming from 66 subsidiaries of 33 large MNCs, our study may potentially suffer from non-independent error terms. While including firm dummies for all MNCs would have been desirable, high correlations between firm dummies and our industry measure made this procedure infeasible. For similar reasons, the use of a fixed effect model had to be ruled out. To assess the potential impact of firm effects, we examined the MNCs’ variance across our dependent variable. This analysis showed that almost all MNCs exhibit considerable variance. Only three cases (firms) raised suspicion, i.e. lacked within firm variance. However, rerunning our regression without these cases, as well as controlling directly for correlations of standard errors using STATA 8 software did not significantly change our results. In addition, we computed a model using only one knowledge transfer per firm thus circumventing the problem with non-independent observations. All coefficients closely correspond to the full model, thus confirming the robustness of our results.
Collectively, these observations suggest that firm effects are unlikely to impact our model. However, it would be desirable to replicate our study with datasets not suffering from these constraints.

While our results demonstrate an independent confirmation of three postulated hypotheses, the relatively low $R$-square (0.145) suggests that other, not included, variables explain a fair share of the non-accounted variance. This limitation also bears the largest potential for further research. In particular, controlling for more characteristics of the individual units (e.g. size and age), as well as including relational variables such as the power of subsidiary managers (Mudambi & Navarra, 2004), motivations to share knowledge (Mahnke, Pedersen, & Venzin, 2004) or the specific task context (Haas & Hansen, 2005) would enrich our study.

6. Conclusion

A central question in the current debate on value creation in the MNC is to what extent, and through which determinants, headquarters benefit from knowledge transfers stemming from their foreign subsidiaries. In this paper, we aimed to shed light on several factors impacting headquarters’ ability to learn from their subsidiaries. Our results show that headquarters’ benefit from reverse knowledge transfer depends on the subsidiaries’ strategic mission, the economic development of the source country, as well as the absorptive capacity of the headquarters. Context similarity, in turn, had no significant impact on the benefits of knowledge transfer.

These results, we suggested, have important implications for practitioners and further scholarly research alike. For managers who have to shape the global knowledge management processes of their firms, it might be worth noting that more knowledge inflow does not necessarily lead to more benefits. Incoming knowledge is filtered according to certain criteria. Thus, a contingency approach, which treats different sources of knowledge differently, might be warranted. In this respect, managers may find it most convenient to focus on strategic lead units, as it is their knowledge that is rated as most beneficial. Headquarters managers should ensure that this type of knowledge inflow receives the organizational attention necessary to extract all valuable information. Second, given the discrepancy of the (low) amount of competitor data transferred compared to the benefits of this knowledge, reporting routines should be designed in such a way that competitor information is called for on a regular basis.

In addition, our results confirm the importance of headquarters’ own (prior) knowledge in the field. In other words, while local knowledge might be potentially beneficial, firms trying to fully rely on subsidiary knowledge are bound to fail as a result of their inability to utilize this knowledge properly. This finding might also spur additional research in a related field, as it seriously questions MNCs’ abilities to outsource their knowledge competences completely. Without a capability to absorb (i.e. understand) offshore knowledge, strategies attempting to acquire knowledge ‘on the market’ are also likely to fail (Zaby, 1998).

Our findings also show that building the competitive advantage on knowledge as a primary resource is a delicate issue. Focusing on headquarters’ benefits from reverse transfers is an important step to deepen our understanding. However, valuable knowledge generated in subsidiaries might be ignored because it does not slip through headquarters’ filters. Thus, relaxing the condition of hierarchical relationships might be another avenue for future research.
Appendix. Reduced model: $N=33$

<table>
<thead>
<tr>
<th>Independent variables</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td>$3.644 \times 10^{-2}$</td>
</tr>
<tr>
<td>Economic development</td>
<td>$-1.014$</td>
</tr>
<tr>
<td>Implementer</td>
<td>$1.248$</td>
</tr>
<tr>
<td>Global innovator</td>
<td>$-0.881$</td>
</tr>
<tr>
<td>Integrated player</td>
<td>$2.334^{**}$</td>
</tr>
<tr>
<td>Absorptive capacity</td>
<td>$0.713^{***}$</td>
</tr>
<tr>
<td>Perceived cultural distance</td>
<td>$-0.648$</td>
</tr>
<tr>
<td>Organizational distance</td>
<td>$0.156$</td>
</tr>
</tbody>
</table>

**Model statistics**

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<table>
<thead>
<tr>
<th></th>
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</tr>
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<tbody>
<tr>
<td>$R^2$</td>
<td>0.712</td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>0.559</td>
</tr>
<tr>
<td>$F$-Score</td>
<td>4.638</td>
</tr>
<tr>
<td>Sign.</td>
<td>0.005</td>
</tr>
</tbody>
</table>

*p < 0.1; **p < 0.05; ***p < 0.01, Local innovators were used as a baseline. Dependent variable: benefits of reverse knowledge transfers.

References


IMD (2002). World Competitiveness Yearbook, Lausanne.


