

Means of Knowledge Acquisition and Knowledge Transfer Mechanism in the Internationalization Process

LINK-Working Paper

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Abstract

This large-scale study explores the performance implications of different combinations of knowledge sourcing and transfer mechanisms of multinational corporations (MNCs). The focus is on transfer of internationalization knowledge. After having acquired knowledge in foreign markets, the MNCs face a choice as to the mechanism used for transferring this knowledge to other units of the corporation. MNCs can use “rich communication media” that are able to transfer experiential knowledge as acquired originally. Alternatively, the MNCs may aim to codify the knowledge in written media in order to transfer it to other units. A wrong choice of transfer mechanism may result in unnecessarily high communication costs or impaired quality of the knowledge subject to transfer. On the basis of data on Danish MNCs the performance implications of the transfer mechanism choice is examined.

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Introduction

There is an increasing interest in investigating knowledge, its sources and transfer in multinational companies (MNCs). The existence of knowledge and competencies is a central theme in many theories on MNCs. In the works by Hymer (1976) and Dunning (1988) it appears under the heading 'firm specific advantage'. Other theories (Buckley and Casson 1976; Caves 1982) also emphasize the central role of knowledge and capabilities in MNCs. Also, the behavioural theories (e.g. Johanson and Vahlne 1977) presume that the acquisition of knowledge is the driving force in the internationalization process. However, the perception of knowledge and the scope for managerial discretion on the acquisition, articulation and transferability of knowledge differ in these theories.

The internationalization theory (Bilkey and Tesar 1977; Johanson and Vahlne 1977) propose that the knowledge required in the internationalization process is mainly acquired as experiential and context-specific knowledge that is hardly capable of being articulated and transferred to other MNC units. This leaves limited scope for essential activities like organizational learning and global exploitation of the acquired knowledge. In contrast more recent contributions emphasizes that the ability to create and transfer knowledge internally is one of the main competitive advantages of multinational firms compared with their domestic counterparts (Anand and Kogut 1997; Ghoshal 1987). A common theme in this line of research is that MNCs create knowledge in one country and then exploit it in another country, which implies international transfer of knowledge by MNCs. Indeed, one of the very reasons why MNCs exist is that they are an efficient vehicle for creating and transferring knowledge (Kogut and Zander, 1993).

The internationalization theory (Johanson and Vahlne 1977) emphasizes the basic characteristics of the internationalization knowledge as being either experiential or objective and that this has severe implications for the feasibility of articulating and transferring the knowledge. They propose that either the knowledge is available in the form of objective knowledge that are capable of being articulated and transferred, or the firm has to acquire the knowledge through its ongoing business activities which cannot be articulated or transferred. In this paper we argue that rather than look at experiential contra objective knowledge as basic characteristics that determines the management of the knowledge it is more appropriate to look at experiential contra objective knowledge as two alternative means of acquiring the requisite knowledge. While the implication of the internationalization theory is that (the lack

of) managerial choices are more or less given by the basic characteristics of the requisite knowledge we on the contrary propose that managers discretion do matter. Managers have to decide: 1) the mode of knowledge acquisition (experiential or objective), 2) to what extent experiential knowledge should be articulated, and 3) the mechanism of knowledge transfer (face-to-face communication or written media).

We posit that the requisite internationalization knowledge can in some cases be acquired as objective knowledge (e.g. by attracting external expertise) and even in the cases where the knowledge has to be acquired as own experiential learning the MNCs that want to transfer the knowledge do have a choice. They can either apply transfer mechanism as rich communication media that are able to handle the complex transfer of experiential knowledge or aim to articulate (codify) the knowledge in written media in the transferring process. We, therefore, analyze the relative reliance of firms on two alternative mechanisms for transferring knowledge, namely, (1) knowledge transfer through face-to-face, informal and team based modes and (2) knowledge transfer based on written media like manuals and blueprints. Moreover, as the effectiveness of these transfer mechanisms may vary depending on the means of knowledge acquisition we analyze the performance effect of the interaction between means of knowledge acquisition and transfer mechanism. A basic purpose behind transferring knowledge is to improve the performance of the firm. But, to the best of our knowledge, researchers have not investigated the relationship between knowledge transfer and performance.

The aim of this paper is twofold. *First*, we fill the gap for large-scale studies on the relationship between the means of knowledge acquisition and the mechanism of knowledge transfer across international borders. *Secondly*, we investigate the relationship between knowledge transfer mechanism and performance. The focus will be on one specific type of knowledge, namely the internationalization knowledge. The internationalization knowledge includes a broad range of knowledge on conducting activities abroad such as knowledge on customer-preferences, supplier-structure, culture, and standards in the foreign markets.

The paper is structured as follows. In the first section we discuss the importance of experiential knowledge in the internationalization process. The second section focuses on the transfer issue. In this section we explore the different transfer mechanisms and develop

testable hypotheses on the relationship between knowledge source and transfer mechanism. In the third section we review previous studies on the effectiveness of knowledge transfer and some variables determining the effectiveness of the transfer are identified. The fourth section covers the empirical part of the paper. It includes method, presentation of data and the results of the statistical tests.

Acquisition of Knowledge in the Internationalization Process

The prominent theory regarding the sequencing of international expansion is internalization theory (Bilkey and Tesar 1977; Johanson and Vahlne 1977). Based on the behavioral theory of the firm (Cyert and March 1963; Aharoni, 1966), this theory describes international expansion as a trial and error based learning process and that firms expand overseas through a series of gradual investments as they gain local market knowledge. It is basically a learning-based theory, postulating that *"International expansion is inhibited by the lack of knowledge about markets and such knowledge can mainly be acquired through experience from practical operations abroad."* (Forsgren and Johanson 1992, p. 10). They posit that knowledge of the market, the clients, the problems and the opportunities abroad are acquired by operating in the foreign market.

Knowledge is divided into objective knowledge and experiential knowledge (Penrose, 1959). Objective knowledge is acquired on the 'market' as external expertise, i.e. market research or recruitment of knowledgeable individuals or teams. A critical assumption of the model is that objective knowledge is of minor importance in the firm's internationalization process, while the on-going acquisition of experiential knowledge determines the gradual commitment in the internationalization process. According to the model the choice of in what form the requisite knowledge should be acquired is more or less given: either the knowledge is available in the form of objective knowledge, or the company has to acquire it through the ongoing business activities. In the first case, the firm can use consultants or, in some cases, get it from e.g. public institutions. While, accumulating experiential knowledge is time-consuming and costly (Eriksson *et al*, 1997).

Presumably, the choice between acquiring objective knowledge versus acquiring experiential knowledge is not that straightforward, but very much depending on cost-benefit considerations. The need for time-consuming experiential learning can probably be brought down to a negligible minimum if the company is willing to pay the (considerable) costs, for example to the use of export consultants. Managers can also make important ‘shortcuts’ to acquiring crucial knowledge by recruiting individuals (or even teams) with valuable international knowledge from other companies organisations (Huber, 1991). The implication is that in some cases the acquisition of objective knowledge may be a substitute for own experiential learning. In this situation the managerial discretion is about the trade-off between relatively slow international expansion in pace with own knowledge accumulation and fast, but expensive expansion.

Accordingly, we can formulate a hypothesis on the managerial choice on how to acquire the requisite knowledge:

H₁ *Firms do have a choice on to what extent they acquire the requisite internationalization knowledge as objective or experiential knowledge.*

Articulation of Knowledge

The internationalization theory emphasizes the individuals as holders of knowledge and the idiosyncratic nature of experiential knowledge. As such experiential knowledge is not articulable *per se*, but characterized by its tacitness. Johanson and Vahlne (1977) propose that knowledge is highly dependent upon individuals and therefore difficult to transfer to other contexts. Or as the model builders maintain by referring to Penrose (1959): "*experience itself can never be transmitted, it produces a change - frequently a subtle change - in individuals and cannot be separated from them*" (Johanson and Vahlne 1977, p. 30). It is through interaction with specific clients and other market actors that firms accumulate experiential knowledge. Consequently, the problems and opportunities intrinsic to a certain market and specific customers will primarily be discovered by those who are working in that market e.g. people in the sales subsidiary or some other front-line unit. However, the context-specific nature of this knowledge makes it of limited use in other markets.

The implication of this strong emphasis on the context-specificity of the acquired knowledge is that there is very limited scope for MNCs to exploit knowledge developed in one country in another country. In the same vein, there is limited scope for organizational learning in the Internationalization theory because the learning is mainly associated with the individual holder of the specific knowledge and not the organization as such. Therefore, decision-making is almost absent in relation to knowledge management issues like articulation and transfer of knowledge. In the Internationalization theory the tacitness of (vital) internationalisation knowledge is predetermined. The knowledge acquired in connection with the international venture is either ‘objective’ or ‘experiential’. The argument in the Internationalization theory is that some characteristics are intrinsic to the experiential knowledge, context-specificity and uncodifiability, which makes it impossible to transfer the knowledge to other locations. In other words, the possibility of transferring the knowledge is hindered by the characteristics that are intrinsic to the knowledge. There is little attention to the possibility of transforming experiential knowledge into objective knowledge, i.e. the process through which tacit skills and knowledge are made explicit¹. However, the almost total absence of studies attempting to refine and empirically verify these concepts and their strong implications is striking. As Kogut and Zander (1992, p. 383) note "... *the idea of tacit knowledge has been widely evoked but rarely defined*". Moreover, the current interests in the experiential and tacit aspects of knowledge has tended to divert attention from the economically more important issue on how the MNCs can exploit their knowledge.

In the same vein, Hedlund (1994) emphasises the opportunities for – and thereby the managerial choice of – transforming tacit knowledge into explicit knowledge:

“The current, and justified, fascination with the tacit component of knowledge must not cloud the fact that organizations to a large extent are ‘articulation machines,’ built around codified practices and deriving some of their competitive advantages from clever, unique articulation. In fact, much of industrialization seems to have

¹ A similar view is found in some versions of the learning literature that emphasizes the tacit nature of knowledge and defines tacit knowledge as knowledge that is not capable of articulation and codification (see e.g. Grant 1996). In this case the knowledge is supposed to be uncodifiable and therefore almost impossible to transfer to another location.

entailed exactly the progressive articulation of craftsman-like skills, difficult but not impossible to codify.” (Hedlund, 1994: 76).

As Håkanson (2000) points out, most tacit skills of economic interest are at least potentially articulable. These include both simple technical skills as well as more complex ones which include also a tacit cognitive dimension. The notable exceptions are the creative skills and capabilities of innovation and entrepreneurship. Thus, knowledge codification – the process of conversion of knowledge into messages which can then be processed as information (Cowan and Foray, 1997) – changes some fundamental aspects of the economics of knowledge generation and distribution. The codification process entails high initial, fixed costs but allows firms to carry out distribution/transfer at very low marginal costs.

Knowledge Transfer and Transfer Mechanism

The term ‘transfer’ is difficult to define. By transfer is implied ‘to carry, convey, remove, or send from one person, place, or position to another’ (Webster’s New Twentieth Century Dictionary, 1979, p. 1938). The term ‘knowledge transfer’ is here used to suggest the dissemination and use of knowledge in MNCs and transfer of knowledge does not imply a ‘full’ replication of knowledge. Indeed, transfer of knowledge is always associated with modification of existing knowledge and creation of some new knowledge. This implies that knowledge is transferred as a particular practice following certain rules and procedures that originate in the knowledge sending unit and then undertaken in the recipient unit. In the recipient unit these practices may or may not be infused with the same values as in the knowledge sending unit. In such cases acquisition of knowledge in the recipient unit may be marginal based on single loop learning (Argyris and Schön, 1978). But, these changes are accommodated within the current institutionalized practices of the firms. The basic characteristics of the old knowledge in the recipient firms remain unchanged. In other cases, a double loop learning takes place and the basic characteristics of the knowledge in the recipient unit is changed. This may lead to changes in the routines and practices in the knowledge recipient unit.

Firms can transfer knowledge across nations through a variety of different modes. We identify two extreme mechanism of knowledge transfer. On one extreme lies “rich communication

media” such as face-to-face, informal interaction, and team based mechanisms. This will require individual or team level visits, sharing of experience and face-to-face interaction or socialization (Nonaka, 1987). On the other extreme, knowledge is transferred in written forms involving transfer based on manuals, data base development, written instructions, and blueprints. In this case little individual level interaction is required. These are only the two extremes on a scale and in most cases the actual transfer of significant knowledge will include both face-to-face communication and written media (reference ?).

The choice of transfer mechanism is obviously related to the characteristics of the particular knowledge in the sense that for some knowledge it would be more appropriate to apply one transfer mechanism than another e.g. it may be more appropriate to apply written media in the transfer of objective knowledge. The appropriability of the transfer mechanism may differ depending on the characteristics of knowledge, as discussed in next section, but the choice of transfer mechanism is still not given by the characteristics of knowledge. It becomes blurred when knowledge is defined by its ability of being transferred as sometimes seen with experiential and tacit knowledge (e.g. Johanson and Vahlne 1977 and Grant 1996). Both because the characteristics of knowledge and the transfer mechanism are logically two separate issues, and because as discussed earlier the characteristics of knowledge are not static i.e. knowledge might be codified. This is in line with Hedlund and Nonaka (1993) that distinguish between: the storage of knowledge (as a stock), the transfer of knowledge (as a flow), and the transformation of knowledge (as interactions). Storage indicates that a stock of knowledge resides in a particular person/organisation. Transfer refers to knowledge that is communicated from one unit/person to another. Transformation indicates a process by which knowledge is "*added, restructured, recontextualized, reinterpreted, etc., or through which new knowledge is generated*" (Hedlund and Nonaka 1993: 123). In the same vein, we propose to logically disentangle the ability of codifying knowledge and the transfer mechanism as two separate issues both open for managerial discretion. Accordingly, we can formulate the hypothesis:

H₂ *Firms do have a choice on to what extent they transfer the internationalization knowledge through face-to-face communication or by written media.*

It is pointed out that the transfer mechanism for the internationalization knowledge is not given, but on the contrary a matter of managerial discretion.

Usefulness of Transfer Mechanism

Face-to-face interaction between individuals and firms allows communication and facilitate knowledge transfer that is experience-based, permits interactive communication, questioning, flexibility, and adaptation (Daft and Huber 1987; Bresman, Birkinshaw, and Nobel, 1999). Almeida and Kogut (1996) show that transfer of people allow exploitation of experiential and tacit knowledge in new locations. Rich communication media also allows a better transfer of knowledge that the owner of the knowledge may be unaware of or is unable to express on a written media. Rich communications media is also suitable when partners need to adapt. These adaptations may concern international differences in culture, laws, and business practices, for example. But, this is a costly mode to transfer knowledge. Face-to-face communication is made difficult due to travelling costs involved and due to differences in organizational culture, and differences in language. Face-to-face communication is easier to facilitate when two units have an identical organizational culture and differences in language are minimal. This media is also more suitable for transferring more 'holistic' types of knowledge, that is knowledge based on words but also facial expression (Huber, 1991; Sharma, 1998), and creating trust between those who transfer knowledge and those who receive it. Face-to-face interaction is required when the knowledge is experience-based.

Knowledge transfer based on manuals etc. implies that the knowledge is objective and codified and the cause-effect relationship is established. It should be possible to separate knowledge from the person who acquired it first, and to separate a particular piece of knowledge from its context, too. However, the more tacit and context-specific the acquired knowledge the less efficient the use of manuals and other written media to transfer knowledge. Manuals and other written media are cost efficient transfer mechanisms. However, these media are less usable when it comes to transfer of knowledge that requires mutual adaptation between the knowledge recipient and the knowledge transferring units. Furthermore, the use of non-personal media requires that the knowledge receiving unit has already developed sufficient 'absorptive capacity' so that it can decide on which knowledge

the firm wants to import from outside and how to integrate knowledge from the outside in firms. Thus, these two means of transferring knowledge across international borders may differ with respect to their operation costs and ability to keep the knowledge intact during the transfer process. In other words, as argued earlier, in international knowledge transfer decisions, managers have a choice and the suitability of the two transfer mechanisms depends on the character of the knowledge subject to transfer. Accordingly, we can formulate the following two hypotheses:

H₃ *Knowledge that has been acquired as experiential knowledge will be transferred mainly through rich communication media.*

H₄ *Knowledge that has been acquired as objective knowledge will be transferred mainly by written media.*

Stickiness of International Knowledge Transfer

Prior research on international knowledge transfer has attempted to identify factors that inhibit or facilitate knowledge flows between MNC units. Ghoshal, Korine and Szulanski (1994) found that informal networking activities such as direct contact among managers through joint work in teams, task forces, etc., were the main determinants of knowledge flows in MNCs. More recently, Szulanski (1996) explored “internal stickiness” of knowledge, i.e., factors that impede the intra-firm transfer of knowledge. He identified two sets of factors that create internal stickiness of knowledge in firms and impede their internal transfer: motivational factors and knowledge-related factors. The latter stem from the tacit, context-specific and ambiguous kind of knowledge which is difficult to transfer from one location to another, while the former is related to the motivation of the subsidiary to apply the necessary time and resources to conduct the transfer. Motivation to acquire knowledge is important as the new knowledge may disrupt current organizational practices and working routines. Knowledge acquisition may require substantial investments in time and effort (Szulanski, 1996).

Transfer of knowledge is influenced by socio-cultural or institutional distance between the target market and the home market of firms (Adler, 1995). Factors such as differences in language, business culture, and the institutional framework constitute psychic distance between countries (Johanson and Vahlne, 1977). Knowledge in firms is contingent on their socio-cultural environment (Hofstede, 1984). The knowledge that is appropriate in one country may not be appropriate for others. This may create problems in transferring knowledge. As the psychic distance between nations increases it is more difficult for firms to acquire knowledge from abroad (Mowery, et. al., 1996). Thus, a clash between national cultures may jeopardize the international transfer of knowledge. Knowledge acquisition is lubricated when the new knowledge is consistent with the recipient's current stock of knowledge. Otherwise, the knowledge recipient unit may not catch the incoming signals.

The current stock of accumulated knowledge in firms shape their 'absorption capacity' (Cohen and Levinthal, 1990), which determines their capacity, speed, and direction to transfer as well as absorb knowledge. Simonin (1999) found that experience with particular partners eases subsequent transfer of marketing knowledge to the same firm. He also found that general experience in transferring knowledge eases future transfers of knowledge. The larger the gap between the accumulated knowledge in the transferring and the recipient firm the more difficult and less effective the transfer. If the gap between the knowledge base of the two firms is large then the recipient will fail to catch and decode the incoming signals from the knowledge transferring firm.

In addition, developing knowledge transferring routines demands repetition. Repetition in transfer implies standardization of the transfer process. Teece (1977) found that the principal factors determining the transfer of knowledge are the degree of previous experience of transferring knowledge of firms, the cost of transfer, the age of the technology, and the number of firms using similar technology. Davidson and McFetridge (1985) found that transfer to unaffiliated firms is promoted if the firms have transferred knowledge in past. Kogut and Zander (1992) found that international transfer of knowledge is explained by the tacitness of the knowledge. They operationalized tacitness along codifiability, teachability, and complexity of knowledge. Firms having previous experience of knowledge transfer have developed procedures for codifying and transferring knowledge. Similarly, with age knowledge becomes less tacit and more codifiable. Transferring experiential knowledge is

more difficult than transferring objective knowledge (Zander, 1991; Szulanski, 1996). Similarly, recipients with past experience of knowledge acquisition have developed routines for absorbing and learning knowledge. They may also have a positive orientation towards knowledge acquisition. Knowledge transfer is also inhibited by firm level factors such as a lack of perceived reliability of the knowledge transferring firm.

Performance of Knowledge Transfer

In Teece's (1977) seminal study of knowledge transfer, he estimated that the cost of international transfer of knowledge vary from 2 to 59% of the total cost. These costs declined with successive transfers, and with the increasing experience of firms. As stated by Kogut and Zander (1993) '*...these costs are derived from the efforts to codify and teaching complex knowledge to recipient..*' (p. 630). We posit that the cost of international transfer of knowledge varies depending on the fit between the character of the knowledge and the transfer mechanism of knowledge.

Objective knowledge is transferred most efficiently through manuals and blueprints, because it will save the unnecessary communication costs associated with face-to-face communication. These costs are related to such aspects as international travelling and managerial time spent on documentation. Experiential knowledge, on the other hand, is transferred most efficiently through face-to-face communication, because otherwise the organization will incur a substantial knowledge loss. This is because not all knowledge in firms can be expressed in symbols and text. In their study of Disney, Branen and Wilson (1996), found that Disney in its internationalization process was unable to replicate its knowledge elsewhere. Due to the historical nature of the knowledge accumulation process the firm was not fully aware of all its knowledge. Choosing the appropriate transfer mechanism is important if the firm is to transfer knowledge efficiently. Therefore, we can formulate the following hypothesis:

H₅ *The transfer performance is maximized when experiential knowledge is transferred by rich communication media and objective knowledge by written media.*

The logic of the hypothesis on the performance fit between the character of knowledge and the transfer mechanism is shown in Table 1.

Table 1. The performance fit between means of knowledge sourcing and transfer mechanism

		Means of knowledge sourcing	
		Experiential ↔ Objective	
Knowledge Transfer mechanism	Rich communication media ↕ Written media	Fit	Misfit (excessive communication costs)
		Misfit (knowledge loss)	Fit

The Data

Data have been gathered by questionnaire within the ongoing research project Learning in the Internationalization Process that includes researchers from Denmark, Finland, New Zealand, Korea, and Sweden. A pilot study was conducted in 1997 in which ten Swedish were asked to answer the questionnaire in an interview situation. The final standardized questionnaire was sent out in August 1998 to all Danish firms with 20-200 employees that had international operations i.e. export or subsidiaries abroad. The database CD-Direct was used to identify all the Danish companies that were applying to the two criteria (1) having 20-200 employees in Denmark and (2) conducting international operations. The population comprised 723 firms that vary in size (between 20-200 employees), industry (both manufacturing and service firms

are included) and geographical location (of their international operations). The reason for choosing this population is that these firms are actively involved in foreign operations and the transfer of the required internationalization knowledge.

The questionnaires were mailed personally to the CEO. Most questionnaires were completed by CEOs or other top executives. A reminder was mailed one month after the initial mailing. Upon this follow-up procedure the number of replies reached 246, corresponding to 34 per cent response rate. For various reasons (e.g. no foreign activities anymore) a number of returned questionnaires were inadequate. After exclusion of incomplete questionnaires a total of 198 replies - making up a net response rate of 27,4 per cent - were usable for data processing. A test was conducted to check the sample for possible non-response bias. Regarding size and number of foreign subsidiaries no statistically significant differences between respondent and non-respondent were found.

An average profile of the firms in the sample is shown in Table 2. Reflecting a considerable variation the average size of the sample is 192 employees (in Denmark and abroad) providing turnover of DKK 238,000,000 (US \$ 28,000,000). One seventh of the personnel is employed outside Denmark and almost half of the average turnover originate from overseas activities.

Table 2. Characteristics of the sample (N=198)

Company characteristics	Mean (1998)	Standard deviation
Total turnover (mill. DKK)	DKK 238 m. (US \$ 28 m.)	488
- proportion of sales abroad (per cent)	42.9 %	31.2 %
Total number of employees	192	419
- proportion employed overseas (per cent)	14 %	23 %
Number of foreign countries in which the company operates	18 countries	17
Years of export experience	21 years	18

The average firm is indeed highly internationalized and possesses considerable experience in conducting foreign operations. However, the sample includes also a number of what one may call novice exporters.

Operationalization of Variables

In the questionnaire respondents were asked to select one recent business assignment (e.g. entering a new market or considerable expansion of existing business) that is important to their firm and through which their company is expanding internationally. This assignment should preferably be well underway so that the company would already have started doing business in the foreign location. Given this focus, the companies should indicate the amount and character of the internationalization knowledge required for this particular foreign expansion. Following Erikson *et al.* (1997) the required internationalization knowledge is of three different kinds: Institutional knowledge on the host country, knowledge on counterparts in the host country and organizational knowledge on managing foreign operations. All three kinds of internationalization knowledge are required to conduct foreign activities. Furthermore, each of these three kinds of internationalization knowledge are divided into 6-7 items - or as we label them knowledge components. The means of knowledge acquisition and the knowledge transfer mechanism is then assessed for all twenty knowledge components (these are listed in Table 3) that taken together covers all aspects of internationalization knowledge.

The *means of knowledge acquisition* was measured by asking the firms to indicate for each of the twenty knowledge components to what extent the required knowledge to conduct the particular assignment were acquired as own experiential knowledge contra acquisition of external expertise. For each knowledge component they were asked to indicate the means of knowledge acquisition on a 7-point Likert scale going from 1 (=own experiential knowledge) to 7 (=acquisition of external expertise).

The applied *mechanism of knowledge transfer* was measured in a similar way by asking the firms to indicate to what extent the required internationalization knowledge for that particular foreign assignment was transferred by face-to-face communication contra written media.

They were asked to indicate this for each of the twenty knowledge components on a 7-point Likert scale going from 1=daily face-to-face communication to 7=manuals or other written media.

In order to test the hypothesis on performance fit we have asked the firms to indicate the perceived performance of the particular foreign assignment on different dimensions of performance. The firms have indicated the expected gains from the particular foreign assignment on a 7-point Likert scale going from 1=no gains to 7=substantial gains in relation to *profitability* and to *acquisition of new knowledge*.

Results

Our first hypothesis is proposing that firms do have a choice in the way they acquire the knowledge that are important for conducting their foreign activities. As the two extremes on a scale they can either choose to acquire the knowledge by own time-consuming experiential learning or they can acquire it by buying external expertise (objective knowledge). In Table 3 is shown how the responses are distributed on the 7-point Likert scale (1=own experience and 7=external expertise) for each of the twenty knowledge components. The lower the value the larger the propensity to acquire the specific knowledge component as experiential knowledge and the larger the value the more the firms tends to acquire the knowledge by means of external expertise. The values 1-2 are indicating that the knowledge is mainly acquired as by own experience, the values 3-4 are indicating that the firms are acquiring both own experiential knowledge and buying external expertise, while the values 5-7 are indicating that the knowledge is mainly acquired through external expertise.

Table 3. The means of knowledge acquisition for each knowledge components.

Components of Internationalization Knowledge	Means of knowledge acquisition (1=own experience and 7=external expertise) Number of firms (per cent of all 198 firms in parenthesis)		
	1-2	3-4	5-7

Knowledge on the host country on....	Technology standards	121 (61%)	51 (26%)	26 (13%)
	Laws on products and quality standards	84 (43%)	64 (32%)	50 (25%)
	Business legislation	62 (31%)	67 (34%)	69 (35%)
	Financial practice and currency rules	82 (42%)	66 (33%)	50 (25%)
	Business culture	119 (60%)	63 (32%)	16 (8%)
	Infrastructure	93 (47%)	76 (38%)	29 (15%)
	Structure of industry	95 (48%)	74 (37%)	29 (15%)
Knowledge on....	Customers in Denmark	150 (76%)	23 (11%)	25 (13%)
	Customers abroad	134 (68%)	39 (20%)	25 (12%)
	Suppliers in Denmark	126 (63%)	39 (20%)	33 (17%)
	Suppliers abroad	118 (59%)	45 (23%)	35 (18%)
	International organizations	70 (35%)	77 (39%)	51 (26%)
	Authorities abroad	57 (29%)	66 (33%)	75 (38%)
Overall knowledge on	Human resource management abroad	113 (57%)	59 (30%)	26 (13%)
	Financing abroad	59 (30%)	81 (41%)	58 (29%)
	Development and adaptation of products	136 (69%)	50 (25%)	12 (6%)
	Development and adaptation of production	125 (63%)	56 (28%)	17 (9%)
	Making business with new customers	137 (69%)	54 (27%)	7 (4%)
	Making business on new markets	121 (61%)	62 (31%)	15 (8%)
	Collaboration with other companies	101 (51%)	81 (41%)	16 (8%)

As can be seen in Table 3 own experiential knowledge (values 1-2) is clearly the main way of acquiring the internationalization knowledge. For twelve out of the twenty knowledge components more than fifty percent of the responses are on the values 1-2. This confirms the high importance attached to own experiential learning as proposed by the internationalization theory (Johanson and Vahlne 1977). The knowledge that is needed to conduct the foreign expansion is to a larger extent acquired as experiential knowledge than as objective knowledge. However, the distribution in Table 3 is also showing that not all the required internationalization knowledge is acquired through own experiences. In fact, if we take all twenty knowledge components together then a little more than half of the responses (53 per cent) are on the values 1-2, about one third (30 per cent) are on the values 3-4, and the remaining one sixths (17 per cent) are on the values 5-7. We can therefore conclude that far from all the internationalization knowledge is gained through own experiential learning. Managers do have a choice in the way they acquire the necessary knowledge and the empirical evidence cannot justify the sole focus on experiential knowledge.

The extent of the needed experiential contra objective knowledge varies for the knowledge components. The knowledge components with the highest level of objective knowledge are

those areas with most codified information available. Those are areas such as knowledge on foreign business legislation, financing abroad and authorities abroad. At the other end of the spectrum we have areas such as knowledge on product adaptation and customers which are the areas with the highest level of experiential knowledge. These are the areas where the firms have to acquire the needed knowledge by their own learning-by-doing processes, because no objective knowledge exists on the specific context in these areas. Rather than being based on one sole type of knowledge it seems like what matters is the combination of the experiential and objective.

In table 4 is shown which knowledge transfer mechanism is applied for the particular knowledge required for the international assignment. The values 1-2 indicate that face-to-face communication (rich communication media) is applied, values 3-4 that both rich communication and written media are applied, and finally values 5-7 that mainly written media is applied in the knowledge transfer process. For ten of the twenty knowledge components more than fifty per cent of the respondents indicate face-to-face communication as the applied transfer mechanism. Taking all the twenty knowledge components together a little less than half of the respondents (48 per cent) indicates that they have applied face-to-face communication (values 1-2), a third (33 per cent) indicates both rich communication and written media (values 3-4), and the remaining one fifths (19 per cent) indicates written media as the proper transfer mechanism. This distribution is quite similar for all three kinds of internationalization knowledge, however, with a slightly higher proportion of firms applying written media in the transfer of institutional knowledge on the host country (first seven knowledge components). The fact that the firms apply a variety of knowledge transfer mechanism when they transfer the required internationalization knowledge confirms Hypothesis 2 that the firms do have a choice when it comes to the mechanism of knowledge transfer.

Table 4. Mechanism of knowledge transfer for each knowledge components

Components of Internationalization Knowledge	Knowledge transfer mechanism (1=face-to-face and 7=written media) Number of firms (per cent of all 198 firms in parenthesis)
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		1-2	3-4	5-7
Knowledge on the host country on....	Technology standards	81 (41 %)	55 (28 %)	62 (31 %)
	Laws on products and quality standards	63 (32 %)	52 (26 %)	83 (42 %)
	Business legislation	73 (37 %)	69 (35 %)	56 (28 %)
	Financial practice and currency rules	75 (38 %)	67 (34 %)	56 (28 %)
	Business culture	125 (63 %)	57 (29 %)	16 (8 %)
	Infrastructure	95 (48 %)	80 (40 %)	23 (12 %)
	Structure of industry	96 (48 %)	79 (40 %)	23 (12 %)
Knowledge on....	Customers in Denmark	118 (59 %)	47 (24 %)	33 (17 %)
	Customers abroad	110 (55 %)	49 (25 %)	39 (20 %)
	Suppliers in Denmark	107 (54 %)	52 (26 %)	39 (20 %)
	Suppliers abroad	100 (50 %)	63 (32 %)	35 (18 %)
	International organizations	76 (38 %)	82 (42 %)	40 (20 %)
	Authorities abroad	71 (36 %)	73 (37 %)	54 (27 %)
Overall knowledge on	Human ressource management abroad	110 (55 %)	59 (30 %)	29 (15 %)
	Financing abroad	71 (36 %)	77 (39 %)	50 (25 %)
	Development and adaptation of products	100 (51 %)	64 (32 %)	34 (17 %)
	Development and adaptation of production	93 (47 %)	68 (34 %)	37 (19 %)
	Making business with new customers	111 (56 %)	71 (36 %)	16 (8%)
	Making business with new customers	107 (54 %)	74 (37 %)	17 (9 %)
	Making business on new markets	103 (52 %)	73 (37 %)	22 (11 %)
	Collaboration with other companies			

Our hypotheses 3 and 4 are proposing a relationship between the character of the acquired knowledge and the applied transfer mechanism where experiential knowledge is proposed to be mainly transferred by rich communication media and objective knowledge mainly by written media. A test of Hypotheses 3 and 4 is conducted by estimating the correlation coefficients between the means of knowledge acquisition (experiential contra objective knowledge) and the transfer mechanism (face-to-face contra manuals) for each knowledge component. Following the hypotheses the correlation coefficients are expected to be significantly positive. The coefficients are shown in Table 5, fifth column. 18 out of the 20 coefficients are, as expected, significantly positive. All in all, this is giving strong support for the hypotheses that knowledge acquired as experiential knowledge tends to be transferred by rich communication media, while objective knowledge is rather transferred through written media.

Table 5. The means of knowledge acquisition and the transfer mechanism for each knowledge component

Knowledge components		Experiential - objective	Face-to-face – manuals	Correlation Coefficients
		Mean	Mean	
Knowledge on the host country on....	Technology standards	2.54	3.50	-0.10
	Laws on products and quality standards	3.19	3.86	0.02
	Business legislation	3.63	3.41	0.16**
	Financial practice and currency rules	3.17	3.42	0.22***
	Business culture	2.43	2.35	0.15**
	Infrastructure	2.80	2.73	0.22***
	Structure of industry	2.86	2.77	0.22***
Knowledge on....	Customers in Denmark	2.12	2.66	0.30***
	Customers abroad	2.35	2.84	0.34***
	Suppliers in Denmark	2.39	2.72	0.46***
	Suppliers abroad	2.54	2.85	0.35***
	International organizations	3.32	3.20	0.36***
	Authorities abroad	3.82	3.40	0.33***
Overall knowledge on	Human resource management abroad	2.48	2.57	0.40***
	Financing abroad	3.48	3.29	0.39***
	Development and adaptation of products	2.18	2.93	0.27***
	Development and adaptation of production	2.36	2.98	0.19***
	Making business with new customers	2.15	2.59	0.23***
	Making business on new markets	2.37	2.61	0.32***
	Collaboration with other companies	2.61	2.72	0.41***

***, ** and * indicates 1%, 5% and 10% level of significance, respectively.

The coefficients are highly significant, which confirms hypotheses 3 and 4, but the coefficients vary from 0.15 to 0.46 indicating that the relationships are far from perfect. Expressed in another way, the mechanism of knowledge transfer is not given by the character of the knowledge, because although there is a strong relationship between the character of the knowledge and the transfer mechanism, a substantial number of firms indicate that they do transfer experiential knowledge by written media or objective knowledge by rich communication media. One way to explore this further is by splitting both the character of knowledge and the transfer mechanism into two groups (values 1-3 and values 4-7) and look at the relationships for all the twenty knowledge components in each firm (20 x 198 = 3960 relationships). Then we can divide all the relationships into a two by two matrix along the same lines as in Table 1. This is done in Table 6.

As shown in Table 6, the main part of the relationships follows the predicted pattern (quadrant 1 and 4). 1.307 relationships (33 per cent) follows the pattern proposed in

Hypothesis 3 of experiential knowledge transferred through rich communication media and 1.303 relationships (32,9 per cent) follows the pattern predicted in Hypothesis 4 of objective knowledge transferred by written media. So all in all two thirds of the relationships follows the predicted pattern. However, it is still a significant number of relationships that follow another pattern (the remaining one third). In 721 (or 18,2 per cent) of the relationships the experiential knowledge is transferred by written media and in 630 cases the objective knowledge is transferred by rich communication media.

Table 6.

		Means of knowledge acquisition	
		Experiential	Objective
Knowledge Transfer mechanism	Rich communication media	1.307 (33,0 %)	630 (15,9 %)
	Written media	721 (18,2 %)	1.303 (32,9 %)

In order to test Hypothesis 5 on the performance fit we have conducted a regression analysis for each of the twenty knowledge components. We apply the following regression model:

$$Performance = f (knowledge, transfer\ mechanism, knowledge*transfer\ mechanism, controls)$$

that includes the interaction term between the character of the acquired knowledge and the transfer mechanism. Following Hypothesis 5 we expect this interaction term to be significantly positive indicating that performance will increase when the character of knowledge and the transfer mechanism fit together.

We have included four control variables in the model reflecting the variables affecting the performance of the knowledge transfer that have been identified in the literature. These four control variables are: 1) Transfer experience (measured as number of previous knowledge transfers to the particular market); 2) Transfer capability (measured as the perception of the costs of knowledge transfer in relation to foreign expansions on a 7-point Likert scale); 3)

International experience (measured as number of foreign markets where the company is active); and 4) Psychic distance (measured as a dummy with the value 0 for neighboring countries and 1 otherwise).

The model was conducted for all twenty knowledge components and with two different performance variables, namely profitability and acquisition of new knowledge for the foreign assignment. This is forty different models. However, in Table 7 is shown the results in the case where all the twenty knowledge components are added together into one single variable (Alpha=0.89 for knowledge acquisition and Alpha=0.92 for transfer mechanism). Table 7 shows the results of the regression analysis in the case where all the twenty knowledge components are collapsed into one single variable, although more rigorous analyses were conducted for all the twenty knowledge components.

As can be seen in Table 7, the interaction term is only significant (on a 10% level) for the performance dimension of increased knowledge, while it is insignificant when performance is measured as profitability of the foreign expansion project. The same picture holds when looking at the similar regression analyses for the individual knowledge components. When performance is measured as acquisition of new knowledge in thirteen out of the twenty knowledge components the interaction term between knowledge acquisition and transfer mechanism is significantly positive, as expected. This is only the case in two out of twenty knowledge components when profitability is the applied performance measure. All in all, the data support Hypothesis 5 on the better performance when the character of knowledge and transfer mechanism fit together in the case where performance is measured more directly as the outcome in the form of increased knowledge. This indicates that knowledge transfer is not a one-way flow of knowledge. The transferring process includes adaptation and modification of the knowledge to the new context which generates new knowledge that flows back to the firm. The reason why firms do not expect any significant effects on the profitability is probably that the profitability is a very overall performance measure determined by many other factors than the knowledge transfer that is our focus in this paper.

Table 5 Regression analysis of the hypothesized model

	Performance dimensions	
	Profitability	Increased knowledge
Intercept	5.13*** (0.96)	6.89*** (1.07)
Knowledge source (experiential – objective)	0.008 (0.10)	-0.32*** (0.11)
Transfer mechanism (Face-to-face – manuals)	0.11 (0.10)	-0.08 (0.11)
Knowledge source*Transfer Mechanism	-0.007 (0.01)	0.19* (0.11)
Transfer experience	0.002 (0.004)	-0.001 (0.003)
Transfer capability	-0.03 (0.09)	-0.05 (0.08)
International experience	-0.001 (0.008)	-0.007 (0.009)
Psychic distance	0.09 (0.24)	0.25 (0.27)
F-value	0.46	2.11**
N	198	198
R-square	2.5%	10.7%

***, ** and * indicates 1%, 5% and 10% level of significance, respectively.

Conclusion

The last decade has generated an increasing interest in investigating the role of knowledge in the internationalization process of firms. While a substantial part of the literature has focused on the efficiency of knowledge transfers inside the MNCL this paper is focusing on the means of knowledge sourcing. This paper discusses the proper transfer mechanism, while prior research has attempted to identify some factors that inhibit or facilitate knowledge flows between MNC units. The main hypothesis of the paper is that the more knowledge has been acquired as experiential knowledge/objective knowledge the higher the propensity of applying face-to-face communication/manuals as the transfer mechanism. This hypothesis was confirmed when tested on data gathered from 198 Danish companies with international operations and cross-border knowledge flows. Furthermore, a third hypothesis on the better transfer performance when experiential knowledge/objective knowledge was transferred by rich communication media/written media was confirmed when performance was measured as gaining new knowledge.

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