Activity Specific Knowledge Characteristics in the Internationalization Process

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Activity Specific Knowledge Characteristics in the Internationalization Process[1]

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Abstract

Purpose - The purpose of this paper is to investigate differences in the characteristics of knowledge, which is very important for the internationalization of different business activities. In particular, the focus is on internationalization in emerging markets such as China and India.

Design/methodology/approach – The paper presents a framework primarily based on knowledge management theory, which is illustrated in relation to interesting cases of four companies that are global leaders.

Findings – An R&D knowledge gap still exists in China and India. Differences across business activities exist in terms of the characteristics of the knowledge, which is most important for the internationalization in emerging markets within multinational corporations (MNCs). The most important knowledge for the internationalization of R&D activities is more tacit than it is for manufacturing activities and international purchasing activities. The source of the most important knowledge for the internationalization of R&D activities, as well as manufacturing activities, is more likely to be the MNC itself, than when marketing activities or purchasing activities are internationalized to emerging markets.

Originality/value – A model is developed that illustrates differences between the most important knowledge for the internationalization of key business activities within MNCs. It is proposed that the technical dimension of tacit knowledge is more easily codified than the cognitive dimension of tacit knowledge. The cognitive dimension of local tacit knowledge is crucial for the internationalization of marketing activities, whereas the technical dimension of tacit R&D knowledge from the home base is crucial for the internationalization of R&D activities.

Keywords – Knowledge transfer, Knowledge characteristics, Internationalization, Business activities, Tacit knowledge, China, India, Knowledge management, Emerging markets

Paper type - Research paper

1. Introduction

The premise of this paper is the need for further empirical research regarding internationalization into emerging markets, in particular the internationalization of research and development (R&D) in emerging markets (Lewin and Peeters, 2006). The central question of this paper concerns how the internationalization of R&D activities to emerging markets differs from the internationalization of other business activities to emerging markets, within multinational companies (MNCs) originating from developed markets.

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Generally, the literature assumes that the exact nature of the business activity being internationalized is of little importance in the internationalization process. Theory concerning internationalization processes, such as the Uppsala model (Johanson and Vahlne, 1977), focuses on marketing and sales activities and disregards R&D activities (Forsgren and Johanson, 2010). Differences among countries in terms of national values (Lunnan et al., 2005), culture (Hofstede, 2001), psychic distance, and institutional distance are often assumed to have similar implications for the internationalization process of business activities. This is so even though distinct differences are likely to exist in terms of the characteristics of the knowledge, which are most important for the internationalization of different business activities. A gap in the literature exists concerning how the internationalization process of business activities differs depending upon the nature of the business activity that is being internationalized. Knowledge sharing within MNCs has become increasingly important (Pihl, 2008). Differences in the characteristics of the knowledge, which is very important for the internationalization of different business activities, is likely to impact the extent to which the related knowledge transfer should be considered an act of replication or of re-creation (Lervik et al., 2005). Studies focusing on strategy in developed markets (Pehrsson, 2010) and international joint ventures (Lane et al., 2001) suggested that the sources of the knowledge and the extent to which knowledge is tacit in the internationalization process differ across different business activities. These findings provide indications that differences exist in terms of which knowledge is most important in the internationalization process of different business activities. However, the issue has been under explored in relation to fully-owned foreign invested R&D subsidiaries in emerging markets such as China and India. The conditions for knowledge transfer between home base and fully-owned foreign invested subsidiaries often differ from the conditions for knowledge transfer between home base and international joint ventures. Therefore, it is necessary to further develop our understanding of internationalization of business activities to fully-owned newly established foreign invested R&D centers. Previous research has mainly focused on developed markets. This study is particularly relevant, as it relates to emerging markets such as China and India.
The paper applies a knowledge perspective because this perspective is particularly relevant in relation to an inquiry that focuses on how the internationalization of a knowledge intensive business activity, such as R&D, differs from the internationalization of other business activities. The following sections of the paper present a relevant theoretical framework in order to shed light on the research question. The framework is then illustrated and applied in an analysis of empirical material from four MNCs. Finally, relevant implications and conclusions are outlined.

2. Theoretical framework

Knowledge that is important for the internationalization of R&D activities concerns knowledge that is important for the innovation performance of newly established foreign invested R&D centers. The following section outlines how knowledge, which is very important for the internationalization process, tends to differ across different business activities in terms of its source and the extent to which it is tacit.

2.1. Knowledge sources

Knowledge and its sources (Foss and Pedersen, 2002) are generally considered to be important for the internationalization process. However, there is disagreement within

the literature concerning what is the source of the most important knowledge in the internationalization process. Competitors and other companies may serve as indirect sources of knowledge in the internationalization process for companies that imitate successful early entrants in new markets (Forsgren, 2002). However, the literature has generally evolved from a focus on market specific knowledge (Johanson and Vahlne, 1977) to general internationalization knowledge (Petersen et al., 2003; Blomstermo et al., 2004a, b). Market knowledge enables activities to be carried out efficiently (Kogut and Zander, 1992), and it builds up over time (Delios and Beamish, 2001). If knowledge is market specific it implies that knowledge about one new market may not be useful concerning another market. On the contrary, if general internationalization knowledge is crucial for the internationalization process, it implies that companies develop knowledge about how to internationalize, which can be used in several markets.

Distinct sequential patterns have been identified in relation to the internationalization processes of business activities within firms (Johanson and Vahlne, 1977, 2009). Certain business activities seem to be internationalized prior to the internationalization of other types of business activities. Typically, the offshoring of lower-level work such as information technology (IT) applications, accounting, and call centers can be followed in due course by the offshoring of higher-levelwork such asR&D, product design, and human resource management (Lewin and Peeters, 2006). R&D activities are therefore normally among the last business activities a company offshores (Mansfield et al., 1979). Activities that have the purpose of developing new technical innovations may often benefit from relatively close co-location (Sölvell, 2003). However, the resulting technical innovations may often be applicable across the globe. This constitutes an important difference between R&D and downstream business activities. Contrary to technology-related business activities, downstream business activities such as marketing have high-location specificity (Anand and Delios, 1997). Pehrsson (2010) investigated business relatedness between business activities in foreign invested subsidiaries in developed markets and their home bases in developed markets. His findings suggested that technological knowledge, which is important for the internationalization of R&D and manufacturing, is highly related to the home base. This relationship is dissimilar to the knowledge that is important for many other types of business activities.

In order to understand these differences, the concept of location specificity, mentioned above, is relevant. Within low-location specific business activities, the MNC itself, rather than the new local context, is likely to be an important source of knowledge in the internationalization process. Location specific business activities such as marketing tend to make use of fewer expatriates than do other business activities (Anand and Delios, 1997). In a newly established subsidiary, the use of expatriates in relation to certain activities may be particularly relevant when the efficient operation of these activities relies on tacit knowledge, which does not originate from the local context. Thereby, the use of expatriates in the internationalization process may indicate transfer of tacit knowledge that is not location specific.

Although the host country's knowledge base may be exploited to some extent, knowledge from the home base is extensively relied on in the internationalization process (Hymer, 1976). This is the case concerning internationalization of R&D between the EU and the USA (Criscuolo et al., 2005). It may be even more so for newly established R&D centers in emerging markets. A characteristic of emerging markets is that they normally experience a transition period in which the percentage of gross domestic

product (GDP), which is spent on R&D, takes a great leap upwards (Jian and Jefferson, 2007). In other words, emerging markets are most often places where R&D investments have not been made very much in the past. Innovation-related knowledge may therefore have had few chances to accumulate (Simon, 1989; Baark, 2007). An R&D knowledge gap is therefore likely to exist in emerging markets. The availability of local R&D knowledge for a new R&D center to tap into may be scarcer than it is in more developed markets. Thus, home base R&D knowledge may be even more important for newly established R&D centers in emerging markets, than for similar R&D establishments in developed markets. When establishing R&D activities, this may have implications for the extent to which it is possible to make use of the local context as a source of innovation-related knowledge. It may be relevant to assume that more experience, as well as a better level of R&D-related knowledge, can be found in the developed market home base location, than in the new location. Home base R&D knowledge may therefore be very important for the internationalization of R&D to emerging markets within MNCs, as shown in Figure 1. It may be so even more in relation to emerging markets than concerning the internationalization of R&D between developed markets.

2.2. Tacit knowledge

The most important knowledge for different business activities in an international context, tends to differ in terms of the extent to which it is tacit (Lane et al., 2001). Tacit knowledge can be defined as knowledge that can only be revealed by its application (Polanyi, 1966; Tsoukas, 2003). If knowledge is tacit, it indicates that the knowledge is "sticky" (Von Hippel, 1994; Szulanski, 1996, 2000), and therefore challenging to transfer within the MNC. Knowledge transfer can be defined as "the process through which one unit (e.g. group, department, or division) is affected by the experience of another" (Argote and Ingram, 2000, p. 151). If knowledge is tacit, it also indicates that it is challenging for the MNC to absorb this knowledge from the new local context in which the MNC is present. In such situations, people can be utilized as an effective means for the transfer of explicit as well as tacit knowledge to new contexts (Nonaka, 1994; Argote and Ingram, 2000; Riusala and Suutari, 2004; Sölvell, 2009). This is especially true concerning technical knowledge (Argote and Ingram, 2000).

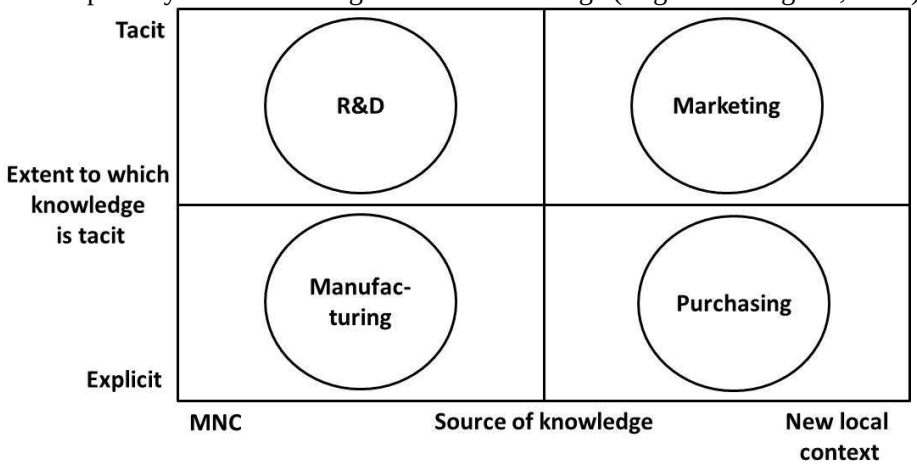

Figure 1: Propositional model outlining characteristics of the knowledge that is the most important for the internationalization of different business activities, from developed markets to emerging markets.

Scholars who have proposed that codification of tacit knowledge is most often possible have questioned the ineffable aspect of tacit knowledge. However, it may not always make economic sense (Nelson and Winter, 1982; Hedlund, 1994). Codification concerns "the process of conversion of knowledge into messages which can be then processed as information" (Cowan and Foray, 1997, p. 596) Recent technological advances have lowered the costs of codification (Cowan and Foray, 1997). What may confuse this discussion is that it centers on something that is assumed a uni-dimensional construct. Tacit knowledge, however, has two dimensions. The technical dimension of tacit knowledge concerns know-how, and the cognitive dimension of tacit knowledge concerns belief systems and mental models (Nonaka and Konno, 1998). Technological advances may to a larger extent ease the codification of the technical dimension of tacit knowledge more than they ease the codification of the cognitive dimension of tacit knowledge. In other words, know-how may be more easily codified than mental models and belief systems. This may be one reason why location specificity differs across different business activities.

R&D knowledge is largely tacit (Cohen and Levinthal, 1990; Petersen et al., 2003). R&D know-how within the MNC is likely to be important for a newly established foreign invested R&D center in an emerging market in order to succeed. Hence (the technical dimension of), tacit knowledge in the R&D home base is likely to be particularly important for the internationalization of R&D activities to emerging markets as shown in Figure 1. When marketing activities are conducted, dominating mental models and belief systems in the local context need to be understood. Hence (the cognitive dimension of), local tacit knowledge may be particularly important for the internationalization of marketing activities as proposed in Figure 1.

International purchasing concerns, "a commercial purchase transaction between a buyer and a supplier located in different countries" (Trent and Monczka, 2003, p. 29). International purchasing is likely to be more challenging than domestic purchasing. Companies should expect difficulties in terms of "increased rules and regulations, currency fluctuations, customs requirements, and a host of other variables such as language and time differences" (Trent and Monczka, 2003, p. 29). A common denominator of all these challenges is that they essentially concern getting access explicit knowledge or information from the local context. As an example, it may be crucial to obtain information about prices and so forth concerning goods to be purchased in the local context. Codified or explicit local knowledge is thereby likely to be particularly important for the internationalization of purchasing activities, as shown in Figure 1. Similarly, manufacturing and production process knowledge is largely explicit as it is codified in manuals and procedures. Marketing knowledge, technological knowledge, and product development knowledge tend to be more tacit (Shenkar and Li, 1999; Lane et al., 2001). However, when an MNC establishes manufacturing activities in a new local context, the MNC itself may often constitute the most important source of knowledge for these activities, as shown in Figure 1.

Figure 1 integrates the above discussion and outlines characteristics of the knowledge that is the most important for the internationalization of key business activities to emerging markets within MNCs. In summary, this framework proposes that the most important knowledge for the internationalization of different business activities is the following:

- tends to be tacit knowledge within the MNC when R&D activities are internationalized;
- tends to be explicit knowledge within the MNC when manufacturing activities are internationalized;

- tends to be tacit knowledge from the new local context when marketing activities are internationalized; and
- tends to be explicit knowledge from the new local context when purchasing activities are internationalized.

3. Methodology

Martinkenaite (2011) recommended to make use of longitudinal data collected from multiple cases in relation to further research on knowledge transfer. This data collection method was used in this study.

The abductive approach (Alvesson and Sköldberg, 1994; Dubois and Gadde, 2002) is the methodological strategy behind this research project. The abductive approach emphasizes theory development as an iterative process of matching theory with reality and vice versa, moving back and forth between empirical findings and theoretical framework, whereby both co-evolve. In order to secure good empirical support for the theoretical framework, empirical findings triggered the search for further theories whereby a continuous interchange between empirical data and theory took place. In terms of analytic techniques, pattern matching (Yin, 2003) has primarily been utilized. This technique is well suited for a research field where little prior research has been done. However, existing theory may still have some relevance. Qualitative data is relevant in this context in order to get "deep" data that is suitable due to the complex nature of the investigated topic, and since so far the amount of prior research is not extensive. However, using pattern matching as an analytic technique is relevant in order to leverage, evaluate, and refine existing theory in relation to the topic at hand.

The basis for this process is an exploratory holistic multiple case study (Yin, 2003), including extensive qualitative empirical material, which has been collected from four Scandinavian companies. The case companies were chosen for good access to the companies, due to both the fact that they are globalized R&D intensive companies with R&D activities in emerging markets, and the leading positions these companies have on a global scale within their respective industries. A case study is a preferable methodological approach for inquiries into complex social phenomena (Yin, 2003; Eisenhardt and Graebner, 2007). 45 semi-structured qualitative interviews were conducted with 31 interviewees in the four case companies from January 2007 until June 2011. Several rounds of interviews were conducted with the case companies in order to be better able to track the development of the cases over time. Each interview normally took around $1\frac{1}{2}$ hours; they were then recorded and fully transcribed. Pack Tech, Med Tech, and Mechanic Tech have established R&D centers in China, and Wind Tech has established a R&D center in India. In all the case companies, R&D employees were interviewed, both in the R&D centers in Asia and in Scandinavia. Interviews were conducted with managers in charge of the overall R&D internationalization process on different levels, as well as expatriates and lower level employees. The interviewees predominantly have technically oriented educations at the Master's or PhD level. However, the list of interviewees also includes, for example, product managers and people who do not work with R&D.

The design is strong in terms of its ability to enable a good in-depth understanding of internationalization processes within different industries, in particular concerning R&D activities. The interview questions relate to R&D internationalization as well as broader questions concerning innovation challenges in general for the company, including the role of the new R&D center in relation to these innovation challenges.

Questions also concern networking and interaction within and beyond the company, and how the internationalization of R&D activities differs from the internationalization of other business activities. Secondary data was also collected, but the empirical data are mainly of a primary kind. Through the use of multiple sources for the case studies, internal validity was addressed for the case studies in terms of number of interviewees and their positions in the organizations. The purpose of presenting quoted responses from a number of interviewees is to add verisimilitude (Tichý, 1974) and represent a wider network of the different interviewees across multiple levels in the four cases. The issues of construct validity and reliability were addressed as key informants have reviewed the case reports. External validity is enhanced by covering four relativity different industries and by developing a relatively industry independent theoretical framework, using the abductive approach outlined in this section.

4. Case presentation

In general, the case companies seem to be content with their R&D establishments in China and India. All companies experienced very low levels of employee turnover in relation to the R&D activities that they have established in these countries.

4.1. Pack Tech

For Pack Tech, the main objective of the establishment of the R&D center in China in 2007 was to support local manufacturing in the country. Some new things have been developed in China, but they are not the key purpose of the R&D center as such.

4.1.1. Knowledge sources

An example of a local source of knowledge the company has tried to leverage in China is that the company arranged a collaborative university competition. Three universities competed against each other in order to come up with new concepts for distribution equipment solutions. Interesting concepts were thereby developed. However, for such collaboration to succeed, it was necessary to share knowledge with the universities. Otherwise, the risk was that the results of such collaboration were not relevant for business applications.

Although information can be provided by going to exhibitions as well as looking at developments made by competitors, the technology used in the company is not easy to grasp. Regardless of educational background, a European engineer or a Chinese engineer, for example, has a long road to follow in order to obtain the knowledge needed in order to understand the technology of the company. This knowledge is concentrated in Europe.

The manager of the R&D center expressed the problem in the following way:

> *In China I had the problem that when I employed people, then they did not have anyone to learn from.* (Expatriate R&D Center Manager, 31 March 2010).

A solution for the problem mentioned above is described in the following quote:

> *You need to have someone from your home organization who has the knowledge* (Interview with Product Manager, 21 September 2010)

However, it was also expressed that expatriates from Scandinavia or Europe are not equally relevant to utilize in relation to business activities other than R&D. For example, concerning activities where there was more direct customer contact, the local market experience of local Chinese employees is indispensable as illustrated by the following quote:

As an expatriate you cannot come there and try to understand the market (Interview with Product Manager, 21 September 2010).

4.1.2. Tacit knowledge

Within internationalized R&D activities, expatriates are more utilized than within other internationalized business activities of the company. Expatriates are always located in the Chinese R&D center, and many exchanges of R&D personnel take place between China and Europe in order to improve the knowledge level of the R&D employees in China. Concerning training in the R&D center, the experience is predominantly that it is beneficial to mix education and work. For example, the training is better if it includes three weeks of education, followed by three weeks of work, which is followed by two weeks of education. This system is better than having five weeks of education followed by three weeks of work.

4.2. Wind Tech

The company established the R&D center in India at the end of 2006. Among other things, the R&D center works with aerodynamics, structural design and calculations, finite element analysis, quality control processes, construction, and reliability. A few inventions concerning wind turbines have been created in the R&D center.

4.2.1. Knowledge sources

R&D activities are considered more knowledge intensive than other types of business activities within the company. The company has internationalized manufacturing to both India and China in similar ways, which was done in accordance with the same set of instruction guidelines, forms, and so forth from Scandinavia.

R&D employees within the R&D center in India expressed that they considered technology to be country specific within the company, due to the vast experience that has accumulated in Scandinavia concerning the technology utilized in the products of the company. From time to time, R&D employees of the company discuss ideas with local university professors. However, large-scale industry-university collaborations do not currently take place, but they may develop in the future.

4.2.2. Tacit knowledge

In terms of developing the knowledge level of the Indian R&D employees, different things are considered instrumental. In order to get “hands on” understanding of the products of the company, the R&D center has the advantage of relative proximity to the manufacturing activities, which are also located in India. In terms of developing deeper understanding, personnel exchanges take place, mainly from India to Scandinavia. Joint project work with home base R&D within the company is also emphasized as being particularly important to this end. When Scandinavian R&D employees visit the R&D center in India, it is normally for a period of three weeks. Some of the R&D employees in India expressed that they would like the Scandinavian R&D employees to stay longer sometimes, in order to have more time to learn from them.

4.3. Med Tech

The company established the R&D center near Beijing by the end of 2001 among other things in order to get closer access to the developing talent base in China. The main activity of the center is to do early-stage biotechnological protein research. Innovative process improvements have been created in the R&D center.

4.3.1. Knowledge sources

From the R&D home base in Scandinavia, the R&D employees in China receive project protocols describing processes they can attempt to improve further. The Chinese R&D employees have shown impressive abilities

to develop their knowledge level. However, home base R&D headquarters remain an important source of knowledge. The Scandinavian part of the company has much experience within various fields of pharmaceutical R&D. Sometimes the Chinese R&D employees have to wait for input from Scandinavian R&D employees before they can proceed. R&D employees from the R&D center try to establish some collaboration with professors from local universities. They write project proposals together in order to apply for research funding. So far, this has not yet developed into close industry-university collaborations.

The company carries out manufacturing in different places of the world. Internationalization of manufacturing activities within the company requires that many procedures be followed. These procedures are most often documented within the company. Internationalization of R&D activities, on the other hand, is knowledge intensive in particular in terms of accumulated trial and error knowledge, which needs to be transferred to the new R&D center. It is the experience of the company that it is easier to internationalize marketing or sales in the new place than it is to establish R&D activities, as exemplified by the following quote, which further illustrates differences between internationalization of different business activities:

> *I think it is much easier to establish marketing or sales in a new place, because then you have a finished product. Then you can hire experienced salespeople, you can hire people who have market understanding* […]. *So I think it is easier to hire resources because you have a finished product, which you need to sell. However, if it is research and development then there is a lot of knowledge, and it is about having the right people. It is about hiring the right people, having the right brains in place* (Interview with Global Product Manager, 9 June 2011).

4.3.2. Tacit knowledge

Scandinavian expatriates have been located in the Chinese R&D center, but none have been located there permanently at all times since the R&D center was established. Exchanges of personnel take place for shorter and longer periods of time. Joint project work with the home base R&D center is emphasized as being particularly important in order to develop the knowledge levels of the employees in the R&D center.

4.4. Mechanic Tech

This company is a leader in automation equipment, and it has established R&D activities in China. An important reason for the R&D establishment there is that it makes possible the better support of local manufacturing, such as adapting existing products to the Asian market. The R&D establishment is part of the overall strategy of the company to increase its global footprint, which makes it easier to carry out sourcing in low-cost countries. However, to enable the use of Chinese engineers for development of new products was also a motivating factor.

4.4.1. Knowledge sources

Internationalization of R&D on the one hand and manufacturing on the other hand is considered to be quite similar within the company. One reason may be that close interaction between R&D and manufacturing is needed for the successful development of the company's products. In relation to both the internationalization of manufacturing and R&D activities, there is a need to train new local recruits. However, when it comes to internationalization of R&D, the challenges of training people are bigger than when internationalizing manufacturing activities, as illustrated by the following quote:

> *The real challenge is to get them to understand the products, which we are developing. To understand better the products and the know-how, and to get a network with the R&D department in Europe. Then that is really the challenge* (Interview with the President of the Chinese Research Center, 19 March 2007).

It is important for the activities of the R&D center to have good interaction with the home base R&D headquarters. The R&D employees in China have a hard time completing projects on their own. Seemingly, they lack experience in terms of managing R&D projects and ensuring that the developed products can be manufactured in a good way. Therefore, they rely on the home base R&D headquarters in Scandinavia to take charge over certain aspects of projects that otherwise take place in China.

4.4.2. Tacit knowledge

The Chinese engineers working in the R&D center develop experience by learning from people from Europe who are also located in the Chinese R&D center. Although this learning process takes place continuously, R&D employees in the Chinese R&D center expressed that it would be beneficial to have more opportunities to develop. In this regard, exchanges of personnel also take place from China to Europe.
The R&D activities of the company in China make more use of expatriates than other business activities as illustrated by the following quote:

> *Concerning production in China, we do not have anyone at all. Within procurement outsourcing, I do not think either that we have anyone. It is more within development that we have a few* (Interview with R&D Strategy Manager, 19 April 2011).

The main problem in terms of training the new R&D recruits in China is that the experienced people in Europe have little time to share the knowledge they have with the Chinese engineers.

5. Analysis

5.1. Lack of "cutting edge" science to tap into in emerging markets

Although the case companies interact to some extent with local universities, innovation-related knowledge does not seem to be locally available to a great extent. Pack Tech R&D China was able to leverage local Chinese universities as sources of knowledge to some extent as indicated in Table I. However, in order to collaborate, the company needed to share quite a bit of knowledge with the universities. One should therefore not necessarily expect local universities in China to be important repositories of innovation-related knowledge. Similarly, Wind Tech has also made use of local professors at Indian universities. Sometimes engineers from the company discussed new ideas with these professors as indicated in Table I. Scientists from Med Tech sometimes wrote project proposals with local university professors, as indicated in Table I. However, large-scale collaboration as such had not yet taken place. Across the cases, the notion that science is not yet "cutting edge" within emerging markets seems to find support. The local context may thereby be less important as a source of knowledge for newly established foreign invested R&D activities in emerging markets than it is in developed markets.

5.2. Knowledge sources

Table I outlines examples of important knowledge for the cases of newly established R&D activities investigated in this paper. The table distinguishes between tacit knowledge and

explicit knowledge.

Table 1: Examples of important R&D knowledge that the R&D subsidiaries receive from home base and the local context

Type of knowledge	Tacit knowledge		Explicit knowledge	
Source	HQ/MNC	Local context	HQ/MNC	Local context
Pack Tech R&D China	Know-how		IT/project platform	Concepts developed with universities
Wind Tech R&D India	Know-how		IT/project platform	Ideas discussed with few professors at universities
Med Tech R&D China	Know-how		IT/project platform Project protocols	Project proposals developed with few professors from local universities
Mechanic Tech R&D China	Know-how		IT/project platform	

It also distinguishes between whether the knowledge is available in the local emerging markets context or in the home base/headquarters of the MNC.

As shown in Table I, new R&D establishments receive explicit knowledge embedded in project platforms and IT infrastructure. This infrastructure tends to be similar in the newly established R&D centers and in the home base R&D headquarters. Although this can be seen as important knowledge, it is merely something that facilitates the utilization of the company's know-how. Hence, the know-how may seem even more important. All the investigated R&D centers received know-how from their home base R&D headquarters, which can be considered tacit knowledge, as indicated in Table I. The importance of know-how from the Scandinavian and European R&D home bases has been emphasized across the cases. Pack Tech experienced that the new R&D employees in China had no one to learn from and that the needed knowledge was not locally available when the company established its R&D center in China. Within Pack Tech, the mix of training and work proved particularly beneficial. The employees needed actively to apply the new knowledge in order to grasp it, and in order to develop know-how of their own. This can be seen as an indication that the knowledge in focus is somewhat tacit. Wind Tech had a similar experience in India, where the engineers in the newly established R&D center needed to build up industry-specific innovation related know-how, which is available in the Scandinavian part of the organization. In order to do so, frequent exchanges of personnel between Scandinavia and Asia, took place. In addition, collaborative project work with the R&D home base is emphasized as important within both Wind Tech and Med Tech in order to build up the knowledge level in the newly established R&D centers.

Med Tech also makes use of expatriates and the exchange of R&D personnel. However, the company is active within an industry characterized by strict documentation requirements from the authorities' side (e.g. US Food and Drug Administration (FDA)). A positive consequence is that well-documented project protocols can be sent to China, thereby easing the buildup of the knowledge level in the newly established R&D center. The R&D employees in the R&D center in China can further improve the processes described in the project protocols and contribute to the innovation performance of the company. However, even though well documented R&D project protocols can help newly established foreign invested R&D centers, the project protocols as such may be of little

help if the know-how needed in order to further improve such protocols is unavailable. It was therefore still very important for the newly established R&D center that tacit innovation related know-how from the Scandinavian part of the company was transferred to the newly established R&D center in China. The experience of Mechanic Tech was similar. R&D employees in the Chinese R&D center expressed that more expatriates from Europe would help them build up their innovation related know-how. This was the case even though the company already made use of many experienced expatriates, as illustrated in Table II. In summary, innovation-related tacit know-how from the R&D home bases seem to be particularly important for newly established R&D activities in emerging markets, as shown in Figure 1.

5.3. R&D versus other business activities

The case companies make more extensive use of expatriates within their R&D activities than within other types of offshore business activities in China and India, as Table II illustrates.

The findings presented in Table II may indicate that R&D activities are less location specific than other business activities, as well as the importance of the transfer of tacit R&D knowledge from the R&D home bases.

Mechanic Tech experienced similar challenges of training people when internationalizing manufacturing and R&D activities. For both types of activities knowledge already present within the company needed to be transferred and shared with new local recruits. However, these challenges seemed particularly difficult in relation to R&D activities, which may be due to the tacit nature of much innovation-related knowledge. It has been expressed by the case companies that it is important to transfer knowledge from within the company to the newly established business activities when internationalizing both manufacturing activities and R&D activities to emerging markets. For example, Wind Tech internationalized their manufacturing activities to both

Table 2: Expatriates within the case companies.

	Pack Tech R&D China	**Wind Tech R&D India**	**Med Tech R&D China**	**Mechanic Tech R&D China**
Expatriates in China/India R&D	Four expatriates There are visits back and forth in China and Scandinavia	The first six months, the R&D center was managed by a Scandinavian expatriate Three week visits are often used in both Scandinavia and India	More than five long contract expatriates have been used. Currently there are two Scandinavian expatriates located in the R&D center There are visits back and forth in China and Scandinavia	At least two expatriates are on contracts for several years. Many expatriates have been utilized since the company established the R&D center There are visits back and forth in China and Scandinavia
Expatriates within other business activities	Approximately 15 high-level expatriates (finance manager, sales manager, etc) out of 1,800 employees in China. Expatriates are relatively less used	Expatriates appear to be relatively less used	Expatriates appear to be relatively less used	Expatriates appear to be relatively less used

China and India in accordance with the same set of instruction guidelines forms provided by the home base of the company in Scandinavia. Similarly, Med Tech experienced that internationalization of manufacturing activities to a large extent required that many procedures were followed. These procedures are largely already well documented. The most important knowledge in the transfer of manufacturing activities thus seems to be codified or explicit knowledge as proposed initially in Figure 1.
With regard to Med Tech, in relation to internationalization of marketing and sales activities, it is important to hire experienced salespeople with market understanding. It thereby seems that local knowledge is of particular importance for this type of business activity. Pack Tech also emphasized that it is very difficult for foreigners to interact with customers in China, which is due not only to language differences. Because Med Tech also emphasized the importance of experience, it may be that the tacit dimension of local knowledge is of particular relevance when internationalizing marketing activities, as proposed in Figure 1.

6. Implications

6.1. Managerial implications

The developed framework can help managers to focus attention on which knowledge is most important for the internationalization of the business activities they are dealing with. For example, tacit knowledge from the home base R&D activities of the MNC is likely to be of particular importance for internationalization of R&D to emerging markets. Knowledge transfer mechanisms, which are particularly suited for the transfer of tacit knowledge, may thereby be especially relevant in relation to the internationalization of R&D activities. It may therefore be relevant to make more extensive use of expatriates in a newly established R&D center than within other types of offshore business activities. Such expatriates may be productive in terms of transferring important know-how, as well as building up relationships between the different places where R&D is conducted within the company. This may further ease the knowledge flows within the organization.

6.2. Implications for further research

In terms of further research, low-location specificity business activities are more interesting to inquire into in relation to knowledge transfer theory than high-location specificity business activities. Low-location specificity business activity knowledge is more likely to be applicable at a low-cost in contexts where it is not yet concentrated than high-location specificity business activity knowledge may be. When a business activity has low-location specificity, it is likely that sources of knowledge that are applicable in other contexts can be identified and transferred such that they create value. However, it is interesting to explore further differences between the characteristics of the knowledge that is most important for the internationalization process across different business activities. This paper has provided and illustrated a framework that further research may attempt to test and validate. It could be relevant to develop a survey in order to do so. This survey could be directed at employees across different business activities in a larger number of internationalizing companies than it was possible to investigate in this study. Thus, it might be possible to improve the external validity of the conclusions of this paper. Such efforts may also help to mitigate an inherent drawback of the case study approach utilized in this paper.

It also could be interesting if further research inquired into whether the conclusions of this paper are particularly relevant in relation to internationalization between developed markets and emerging markets or whether they are also relevant in relation to internationalization between developed markets and other developed markets.

6.2.1. Imitative behavior not a source of knowledge?

Pack Tech, Med Tech, and Mechanic Tech seem to have internationalized into China before their competitors from developed markets have taken similar initiatives. This indicates that imitation of other companies does not seem to constitute an important indirect source of knowledge that the case companies make extensive use of in their internationalization processes. It is therefore not easy to find support for the "imitative behavior" suggested by Forsgren (2002), at least not in terms of imitation of companies from the same industry. However, further research may look into internationalization across industries (Harryson and Søberg, 2009; Søberg, 2010), that is, how imitation takes place beyond immediate competitors.

7. Conclusion

The specific type of business activity has important implications for the type of knowledge that is most important in the internationalization process. Focusing on R&D activities, the paper started out by asking a unique question: how does the internationalization of R&D activities to emerging markets differ from the internationalization of other business activities to emerging markets within MNCs?

A framework primarily based on knowledge management theory was presented and illustrated in relation to four cases. A cornerstone of this framework is Figure 1, which illustrates differences in terms of knowledge characteristics of the most important knowledge for the internationalization of different key business activities. The framework and empirical research suggest that a R&D knowledge gap still exists in China and India. Distinct differences exist in terms of source and the extent to which the knowledge, which is most important for the internationalization of key business activities to emerging markets within MNCs, is tacit. The findings of this study provides support for the claim that technical knowledge, which is important for manufacturing as well as R&D activities, is often locally accumulated. At the same time, it is globally applicable, indicating that the MNC itself is likely to be an important source of knowledge for the internationalization process of manufacturing as well as R&D activities. The most important knowledge for the internationalization of R&D activities is tacit to a greater extent than it is for manufacturing activities and international purchasing activities. Furthermore, the source of the most important knowledge for the internationalization of R&D activities as well as manufacturing activities within MNCs is more likely to be the MNC itself, than when marketing activities or purchasing activities are internationalized to emerging markets. The technical dimension of tacit knowledge is likely to be particularly important for the internationalization of R&D activities. The cognitive dimension of tacit knowledge is likely to be particularly important for the internationalization of marketing activities.

8. Limitations

Parsimony is a characteristic of a good theory (Eisenhardt and Graebner, 2007). As with many theoretical models, Figure 1 can be perceived as simplifying the relationships

it illustrates. However, also characteristic of theory development is that it provides a relevant simplification of reality that enables us to better understand, discuss, and inquire into various subjects.

9. References

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