

Competitive Paper accepted to EIBA, Annual Conference, December 10-12, Maastricht.
Conference theme: 3.1 Knowledge creation and transfer in inter-organizational networks

Work in progress – incomplete, please do not cite or quote!

PRODUCT COMPLEXITY AND KNOWLEDGE TRANSLATION IN THE INTERNATIONALIZATION PROCESS OF FIRMS: AN INTEGRATIVE MODEL

Soon-Gwon Choi
Uppsala University
Department of Business Studies
Box 513
S-751 20 Uppsala
Sweden
phone +46 18 4711613
fax +46 18 4716810
E-mail soon-gwon.choi@fek.uu.se

Anders Majkgård
Uppsala University
Department of Business Studies
Box 513
S-751 20 Uppsala
Sweden
phone +46 18 4713479
fax +46 18 4716810
E-mail anders.majkgard@fek.uu.se

ABSTRACT

This paper investigates the mechanisms through which firms translate knowledge in the internationalization process. Through a literature review we discuss knowledge development, knowledge transfer and knowledge translation. Three propositions are developed and presented. Then, the empirical method and LISREL are presented in order to develop a structural model. The structural model consist of three constructs, (1) product complexity, (2) experiential knowledge and (3) cost of knowledge translation. The results indicate that there is no direct effect of product complexity on cost of knowledge transfer. The results show an indirect effect of product complexity through experiential knowledge on cost of knowledge translation. Our preliminary findings indicate that complex products require an extensive contextual understanding in order to reduce the cost of knowledge translation in the internationalization process of firms.

PRODUCT COMPLEXITY AND KNOWLEDGE TRANSLATION

IAR Systems (IAR) develops, markets and sells a very complex development tool used in the production of microchips. These chips are found in mobile telephones, dishwashers, cars etc. There are many different kinds of chips on the market. IAR's major product is designed to eliminate the differences of these chips with respect to programming of microchips.

IAR has about 100 employees. 50 persons - several PhDs - working with product development in close cooperation with their large international customers (NEC, Philips, IBM, Motorola, Microsoft, Ericsson). IAR has arranged its sales organization in groups according to product type. Each chip has a product manager responsible for the products that support that chip. All regions have their own product manager for each chip. Product managers handle all contact with the chip manufacturers and the chip users, as well as coordinate activities with the development group. As with the subsidiaries abroad, the management of the parent company assumes the responsibility from these product managers in matters of complex or more essential business relations. Technical support is handled by both the regional subsidiaries and head office. Support operations are, similarly to sales, organized according to geographical region with the exception that technical support teams are assigned more than one product category. There are also resources allocated specifically to larger customers. IAR has several large Swedish and foreign international clients, i.e., clients who operate in many countries simultaneously. Foreign establishment started in 1982 in the neighboring Nordic countries.

The company sells in 35 countries, owns four subsidiaries in Scandinavia and have agents in the rest of the countries. 95% of its sales take place abroad. All their customers are engineers with specific high product requirements, who develop computers, mobile phones etc. IAR work in projects with the customers R&D personnel in order to train and educate them about the usefulness and functionality of the product and to develop new products in cooperation. IARs software enhances their customers competitiveness and reduces time to market through the improved usage of the manpower, established quality, programming knowledge and codes. IAR achieves this through giving their software a unique tailor-made user interface that can be used in all development environments regardless of the type of chip being programmed, and through providing means to translate program code.

The IAR case is an example of the phenomenon studied in this paper - the knowledge translation process in the internationalization process of firms. It also shows the importance of

foreign experience and the understanding of product characteristics and its functionality and usefulness in a specific context. The case shows that IAR supply an intangible, knowledge-intensive complex product to large multinational customers. The product itself is hard to understand regarding functionality, quality and usefulness. Well-educated, experienced and specialized engineers work in teams with the customer to develop, adapt, translate and implement the software according to unique requirements and needs held by the customer.

IAR started its foreign establishments in Scandinavia, followed by gradual establishment in more distant markets. IAR developed incrementally a base of experience and confidence in finding unique customer solutions. This has been reinforced by cooperation with large international customers and with large hardware suppliers. Through these business relationships, IAR acquire foreign experience about local markets. Also, product development is realized in the relationships with customers. In the case of IAR the knowledge embedded in the product is unique depending on the usefulness of the product in its own context, for example a mobile phone. It is only in its context the product can create value for IARs customers.

In this paper we define knowledge translation as a use of modified knowledge through the learning, adapting and assimilation process in interaction. It is an incremental and continuous learning process between business parties, assuming knowledge modification to a new context. That is, all knowledge has its own unique context, and it has to be changed and adapted to the new unique context in which that knowledge will be used (Choi and Eriksson, 2000).

The purpose of this paper is to analyze the effect of product complexity on knowledge translation in the internationalization process of firms. What is the effect of product complexity on knowledge translation? What are the individual components in the knowledge

translation process? We try to provide a theoretical and empirical contribution regarding knowledge translation.

The paper is structured as following. We begin with a discussion about knowledge development, knowledge transfer and knowledge translation in the internationalization process of firms. Then, three propositions are developed and tested. In the remaining of this paper we refer to perceived experiential knowledge, then we write knowledge.

INTRODUCTION

The importance of experiential knowledge in the international process is documented well (Johanson and Vahlne, 1977; Cavusgil, 1980; Kogut and Zander, 1993; Eriksson, Johanson, Majkgård, and Sharma, 1997; Madhok, 1997; Majkgård and Sharma 1998; Makino and Delios 1996; Luo, 1999). It has been observed that in the process of internationalization and foreign market entry decision in firms is driven by their experiential knowledge. By experiential knowledge is implied knowledge that firms accumulate by working in the international market (Penrose, 1959). Experiential knowledge is unique and firm specific. Objective knowledge can be acquired through textbooks and marketing courses and are of lesser importance in the internationalization process of firms. The term experiential knowledge in this context consists of all types of knowledge that firms accumulate by being active in foreign markets. Experiential knowledge are developed by interactions with firms, individuals, governmental organizations and non profit organizations. At an aggregate level experiential knowledge may concern business knowledge, i.e. knowledge on local business, institutional knowledge, i.e. knowledge about local institutions, norms, language etc and internationalisation knowledge referring to knowledge about the product, its uniqueness and specific experience (Eriksson, et. al., 1997).

Teece (1980) pointed out that the transfer of knowledge involves a strong element of learning by doing, and it may be necessary for human capital in an effective team configuration to accompany the transfer. This is of crucial importance in the internationalisation process of firms. When it is difficult to separate the different components in the knowledge transfer, then close contacts and interaction are important between the parties in order to achieve the intended outcome of the transfer. The value of knowledge is related to applications, e.g., to its usefulness for specific purposes (Eriksson, Johanson, Majkgård and Sharma, 2000). An important aspect of technology transfer consists of a description of procedures and operations to operate equipment, that is to say codifying. This means that experiential knowledge becomes more accessible and this in turn effect positively the transfer of knowledge across borders. We do not claim that all knowledge can be codified.

The knowledge development perspective explains how firms adapt to new environment, which is changing rapidly. For example, firms accept and modify the new technology to their products and services, and also introduce new processes and routines in their organizations. These efforts to learn new things make the firm develop and grow. Firms also learn about their markets and business actors by doing business. Firms have to learn how they overcome various kinds of situations in local market, and how they solve problems with business partners. Through this process firms will accumulate knowledge and know-how to treat these situations.

In the learning process, definition or view about the objective of learning has a special meaning. That is, by the definition of learning objective (knowledge) the whole learning process is effected. In case if the firms perceive knowledge as explicit, such as technology, firms will concentrate on acquiring new technology or objective knowledge. On the contrary if the firms perceive the importance of developing process of knowledge, they will try to develop relationship with business partners as well as to acquire objective knowledge. We

will discuss knowledge development and knowledge transfer, which explains different learning processes in internationalization of firms.

KNOWLEDGE TRANSFER AND KNOWLEDGE DEVELOPMENT

Kogut and Zander (1993), Makino and Delios (1997), and Choi and Lee (1997) stress knowledge transfer as a critical factor in international business. Teece (1977) showed that the cost of knowledge transfer was 2 to 59% of the whole costs of international business projects. Knowledge transfer is also important in improving firm's ability and competence (Forsgren, 1997; Kogut and Zander, 1993). Especially in the case of strategic alliance, such as international joint venture, successful knowledge transfer between partners is critical factor of duration of strategic alliance (Inkpen and Beamish, 1997; Lyles and Salk, 1997). Contrary, Hamel (1991) argue that it is asymmetry in perceptions of knowledge in alliances resulting in contextuality. Contextuality refers to the embeddedness of knowledge in social systems. His study suggests that not all partners are equally adapt at learning and the partners have different aims vis-à-vis each other and that the process is more important than structure in learning outcomes.

In the knowledge transfer perspective most of researchers concerned the knowledge as separate or formal one, such as technology (Kogut and Zander, 1993). They assumed that characteristics of the knowledge (technology) determine the level of cost of knowledge transfer. Zander and Kogut (1995) suggest that codifiability, teachability and complexity, system dependence, and product observability (imitability), are critical factors of knowledge transfer. That is, if the knowledge is more complex and tacit, the cost of knowledge transfer will be increased. Probably rationalism and characteristics of knowledge are focused on this perspective. The characteristics of knowledge are critical factor of knowledge development and transfer, and contents of knowledge is regarded as knowledge itself.

The perspectives of knowledge development and knowledge transfer suggest some important dimensions in knowledge management of firms. The knowledge development perspective make us realize the importance of knowledge development process, which means knowledge would be developed from business experience with others in foreign market. That is, knowledge is created and developed through the interaction process among various business actors, such as, customers, suppliers, institutions, and competitors. On the contrary, the knowledge transfer perspective suggests the importance of knowledge characteristics in knowledge transferring process. The specific properties of knowledge, which is difficult to transfer, are critical in knowledge transfer process.

As we can see in table 1, both perspectives are concerned about change of knowledge between organizations and reciprocal each other to conceptualize knowledge movement between firms. That is, the one (knowledge transfer perspective) emphasizes the contents, and the other (knowledge development perspective) emphasizes the process of knowledge development and modification in executing international business assignments.

TABLE 1. A COMPARISON OF KNOWLEDGE DEVELOPMENT AND KNOWLEDGE TRANSFER

	Knowledge development Perspective	Knowledge transfer perspective
Commonality	- Knowledge (technology) is a critical factor in international business (for growth and expansion)	
Differences	- process oriented - knowledge development as a determinant factor	- product/service oriented - characteristics of knowledge as a determinant factor

AN INTEGRATIVE MODEL, KNOWLEDGE TRANSLATION

In this paper we try to integrate both knowledge transfer and knowledge development perspectives within knowledge translation perspective. We argue that knowledge has its own specific characteristics within its organizational and market situation. It is quite firm specific and market specific. In this knowledge concept, not only the characteristics of knowledge itself from knowledge transfer perspective, but also the experiential knowledge such as procedural or relational knowledge from knowledge development perspective, are included. So, we insist that knowledge has to be translated to new context, not just transferred, otherwise it is quite difficult for knowledge, which is developed in different context, to be used in another organization or market situation.

Secondly, developmental characteristic of knowledge in transferring process of knowledge is emphasized in this integrative perspective. Knowledge will be developed and translated with incremental process through the interaction with business partners including knowledge source. That is, knowledge can not translated through just one or twice meetings or exchange of several documents. It accomplished by continuous interaction and feedback between knowledge source and translator. The width and depth of business relationship between organization can effect the quality of knowledge translation. In the case of IAR Systems in the introduction part, IAR let their researchers work in projects with the customer's R&D personnel in order to educate them about the usefulness and functionality of the product and to develop new products in cooperation. This co-work enhances knowledge translation between IAR Systems and its customers.

Consequently, knowledge translation means the adaptation and modification of existing knowledge through the relationship development process i.e. attracting, maintaining and enhancing business relationships. The characteristics of knowledge will seriously effect the knowledge development process, because in order to develop knowledge firms have to

understand the knowledge first. This knowledge development process, then effect to the knowledge translation process. Moreover, the characteristics of knowledge, such as complexity, will effect directly to the knowledge translation process also, as which knowledge transfer perspective emphasized.

THREE PROPOSITIONS

On the basis of the literature on knowledge development, knowledge transfer and knowledge translation three propositions can now be developed and specified. Shostack (1977) suggests that customer uncertainty in terms of customers' perception of risk is related to the characteristics of the product. Such characteristics directly influence customer's uncertainty by determining their perceptions of complexity associated with different products.

Eriksson, Johanson, Majkgård and Sharma (1977) found that the more complex product the higher perceived cost in the internationalization process. Moreover, several researchers showed that the characteristics of knowledge, such as complexity, effected the cost of knowledge transfer (Teece, 1977; Mansfield and Romeo, 1980; Kogut and Zander, 1993; Choi and Lee, 1997; Lyles and Salk, 1997). Especially, the characteristics of product technology effect the cost of knowledge transfer in the internationalization process of firms.

In this paper, we discussed knowledge translation as an integrative concept of knowledge transfer and knowledge development. Knowledge translation in internationalization of firms accompanies knowledge transfer from other organizations as well as the development of transferred knowledge into the new context. Consequently, the characteristics of knowledge will effect to the cost of knowledge translation. That is, if knowledge is more complex and

organizational specific, firms will need more time and cost to translate that knowledge. We propose

P1: The less product complexity, the less perceived cost of knowledge translation in the internationalization process of firms.

Experiential knowledge is defined as knowledge of business culture, governments, institutional frameworks, rules, norms and values that apply in the local markets where firms operate. Also, the use of language is one dimension of experiential knowledge (Marschan-Piekkari, Welch & Welch, 1999). O'Grady & Lane (1996) and Eriksson, Johanson, Majkgård & Sharma (2000b) recognize the importance of experiential knowledge and shows that new exporters are less aware of foreign settings. Firms frequently perceive a lack of experiential knowledge such as the international transfer of funds, documentation requirements and foreign business practices (Czinkota & Johnston, 1981), problematic. In addition, managers of firms may not be aware of the underlying assumptions of their own culture, which, in turn, may inhibit them from learning about new foreign environments. In the process of internationalization, misinterpretations may occur (O'Grady & Lane, 1996). Therefore, our second proposition is formulated:

P2: The less experiential knowledge the higher perceived cost of knowledge translation in the internationalisation process of firms.

Finally, the next proposition is our contribution to the efforts of integration between knowledge development and knowledge transfer. While in knowledge transfer only the effect of knowledge characteristics to the knowledge transfer is emphasized, the need of knowledge development in internationalization of firms is stressed. However, there is no discussion about

the effects of the characteristics of knowledge in its development process. That is, if the knowledge is complex and very firm specific, firms need to more efforts to understand that knowledge. Otherwise, firms will meet some difficulties to develop that knowledge. In line of this discussions, we assume that the use of complex products require more experiences in comparison to less complex products.

P3: The less product complexity the less perception of lack of experiential knowledge in the internationalization process of firms.

The three propositions are combined in a structural model, with perceived cost of knowledge translation in the internationalization process as dependent variable. The model is tested empirically on a sample of service and manufacturing firms.

THE EMPIRICAL METHOD

Data have been gathered by questionnaire within the framework of the ongoing research project Learning in the Internationalization Process of Firms. The questionnaire was sent to five countries, Sweden, Denmark, Finland, Korea and New Zealand. We received 176 usable questionnaires from Sweden, 201 from Denmark, 227 from Finland, 166 from Korea and 117 from New Zealand. The total amount of usable questionnaires was 887.

All of the questions are of a close-ended nature, using a 7-point Likert scale ranging from “agree completely” to “disagree completely”. Most of the indicators are perceptual measures, but there are also objective measures.

In the questionnaire, we asked the respondents about lack of perceived experiential knowledge in a specific international business assignments (see table 2, lack of experiential knowledge). Respondents were asked to select an assignment important to their firm and

through which their company is expanding internationally. The assignment should preferably be well underway so that the company already would have started doing business with the counterparts. Where this was not possible, the respondent was asked to choose a recently completed assignment. Examples of assignments that could be selected are: (1) a contract with a new distributor or agent in a new country; (2) a considerable expansion of the business conducted with an existing customer; (3) establishing business with one or more new customers within an existing market; (4) entering new country markets with existing customers; and (5) establishing business with new customers within a new market.

In another battery of questions we asked the respondents about their perceived cost of executing an additional assignment abroad (see table 2, Perceived cost of knowledge translation). These questions do not relate to any specific foreign assignment or product, as the above mentioned questions about experiential knowledge, instead they are based on the respondents previous general international business experience.

LISREL

The propositions are investigated by LISREL (Jöreskog and Sörbom 1993). LISREL has found a number of applications for building causal structures in international business. On the recommendation of Jöreskog and Sörbom (1993), we use LISREL for explorative as well as confirmatory purposes. The method utilizes this fact as it tests the statistical validity of putative structural relations against an error covariance matrix and a correlation matrix. By using both correlations and error covariances, the method provides a more complete estimate of the “true” variation of variables (Jöreskog and Sörbom 1993; Lord and Novick 1968). The variation of variables provides input for the analysis of structural relations in a set of data, which is why it is so important to obtain as complete picture as possible of the variation of variables.

Validity assessment is done in two steps. The first is to validate that the variables used are separate, and not highly intercorrelated (discriminant validity). This is assessed by studying correlations between variables, and forming approximate confidence intervals with the standard error (Jöreskog and Sörbom 1993, pp. 19, 117). The second step of validity assessment concerns the entire model (nomological validity), which includes the relations between variables within the model. The validity of the entire model is determined by measuring the distance between data variation and the structural model (χ^2 and degree of freedom), and a significance test (p-value) (Jöreskog and Sörbom 1993, p. 111-131). The validity of each relation in the model is judged by studying its t- and R^2 values. The R^2 value is a measure of the strength of a linear relationship estimate (Jöreskog and Sörbom 1993, p. 121).

In more complex causal structures, there may be systems of reinforcing and counteracting effects. For example, in a causal model $A \rightarrow B \rightarrow C$, B has a direct effect on C, and A has an indirect effect on C, via B. LISREL estimates the direct and indirect effects between variables in complex causal structures. Studying these effects can help us to better interpret complex causal structures.

CONSTRUCT ANALYSIS

The analysis of propositions is performed with these constructs and their indicators in Table 2.

TABLE 2: INDICATORS AND THEIR VALUES

Indicator	Factor Loading	T-value	R2-value
Product complexity			
What is the degree of standardization of the most import product/service of the chosen assignment?	1.00	-----	1.00
Lack of experiential knowledge			
<i>A lack of knowledge in the following host country conditions is an obstacle when taking and executing the chosen assignment abroad:</i>			
Business laws	0.68	20.39	0.47
Business culture	0.89	26.75	0.80
Language	0.66	19.65	0.43
Perceived cost of knowledge translation			
<i>Based on your previous international business experience, how would you assess the following costs of executing an additional assignment abroad?</i>			
Transfer of knowledge and skills to the host country	0.51	13.86	0.25
Establishing and maintaining customer relationships in host country	0.86	19.82	0.74
Establishing and maintaining relationships with intermediaries in host country	0.63	16.25	0.39

The first construct “Product complexity” consist of one indicator, which is “What is the degree of standardization of the most important product/service of the choosen assignment?”

The standardization level of the respondents most important product is used as a measure of the characteristics of knowledge, because the standardization level of product or service shows the complexity of knowledge and technology within business relationship with partner.

This question shows well the characteristics of their business activity. Usually, the uniqueness and depth of business relationship depends on the characteristics of their most important product or service, because, if their main product is very specific to their customer, they will probably have more frequent and close relationships with their customers. Otherwise, they will have more general relationships.

The second construct “Lack of experiential knowledge” represents the experiencing difficulties in executing assignments abroad, because of lack of experiential knowledge in a certain area. We used indicators, which are concerned about lack of experiential knowledge in specific areas; business laws, business culture, and languages. The knowledge development process was measured by the managers perception of lack of experiential knowledge. In the knowledge development perspective the possession of experiential knowledge is the most critical factor in the internationalization process of firms and experiential knowledge acquired from past business relationships make it easier to do business in that local market. The lack of experiential knowledge means not only shortage of knowledge, but also recognition of needs to develop knowledge more. It probably shows the success level of whole knowledge development process. If the firm perceive seriously lack of experiential knowledge, they will need additional efforts to translate knowledge successfully.

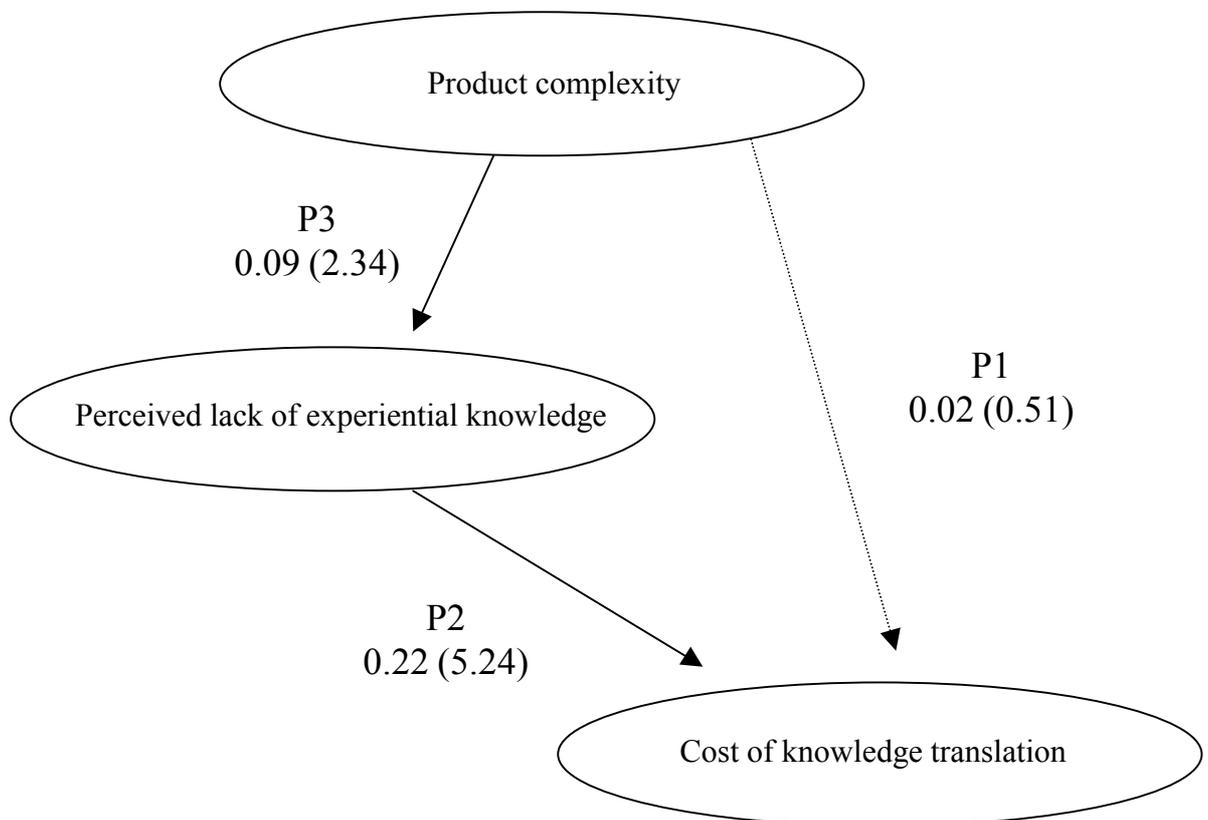
The third construct “Perceived cost of knowledge translation” consist of three indicators, which are about the perceived cost to translate knowledge to the host country. As we discussed earlier, knowledge translation means the adaptation and modification of existing knowledge through the relationship development process i.e. attracting, maintaining and enhancing business relationships. We used three indicators. One is concerned about the cost of knowledge and skill transfer to the host country, the second is related to the perceived cost of establishing and maintaining customer relationships in host country, and the third indicator is related to the perceived cost of establishing and maintaining relationships with intermediaries in host country.

The t-values of indicators are over 13.85, and the R2 values are over 0.42, which means that convergent validity is good.

RESULTS

The hypothesized causal relations are tested in a structural model that is displayed in Figure 1. The model is nomologically valid since the chi-square is 15.94, with 9 degrees of freedom, at a probability of 0.068. The t-values of all indicators in the structural model are over 19.64, and the R² values are over 0.38. These statistical values suggest that convergent validity is good for the constructs.

FIGURE 1: THE STRUCTURAL MODEL



Chi-square with 9 degrees of freedom = 15.94 (P = 0.068)

Proposition 1, the less product complexity, the less perceived cost of knowledge translation, is not supported. It means that the standardization level of the product itself has no significant effect on the perceived cost of knowledge translation in the internationalization process of firms. The result is not in line with existing research, because it is easy to induce that the characteristics of the main product in business relationship have some effects on the perceived cost of knowledge translation. Kogut and Zander (1995) showed positive relationship between characteristics of knowledge and the cost of knowledge transfer, and Lyles and Salk (1997) and Simonin (1999) reported a significant relationship between knowledge characteristics and knowledge transfer. Hamel (1991) argue that a firm's knowledge base is context-bound which refers to the embeddedness in social systems. Probably the reason of this result is that the indicators of the construct "Perceived cost of knowledge translation" asks about the general cost of knowledge translation from previous experience, not just for the translation cost of a particular product.

Proposition 2, The less experiential knowledge the higher perceived cost of knowledge translation, is supported by the significant t-value (5.24) and good factor loading (0.22). As we expected the construct perceived lack of experiential knowledge is positively related to the perceived cost of knowledge translation. That is, if the firm has more experiential knowledge, the firm perceive it less costly to translate knowledge from other organization. This result supports that experiential knowledge has significant role in executing international assignment (Eriksson et al., 1997). It means that firms, which have not sufficiently developed knowledge through business experience, have problems in translating knowledge.

Proposition 3, The less product complexity the less perception of lack of experiential knowledge, is supported by the analysis, even though the factor loading (0.09) is not high, but t-value (2.34) is significant. It shows that characteristics of the product effect the process of experiential knowledge development, which probably means that the characteristics of

knowledge have effects on the developmental process of that knowledge. This is an important common link between knowledge development and knowledge transfer, as we discussed in theoretical part. That is, this result, which is that the characteristics of knowledge effects to the process of knowledge development, supports our intents that both have to be integrated within same framework, knowledge translation.

CONCLUDING REMARKS

This paper contributes to our understanding about knowledge creation and transfer in internationalization of firms. We suggest and conceptualize new concept knowledge translation to develop knowledge transfer perspective by combining the knowledge development perspective and the knowledge transfer perspective in one framework. The preliminary results show that business relationships combined with technology in a unique context is fundamental of the knowledge translation process in internationalization of firms.

Based on the existing literature on knowledge development and knowledge transfer in the internationalisation process of firms, we have developed knowledge translation perspective and tested three propositions about the effects of product complexity on perceived cost of knowledge translation. These findings indicate that complex and unstandardised products require an extensive contextual understanding to reduce the cost of knowledge translation in the internationalization process of firms.

Our paper has several implications. Firstly, by combining the knowledge development theory and the knowledge transfer theory in the same framework we identified critical dimensions in the knowledge translation process. While we did not find significant direct effect of product complexity to the cost of knowledge translation, we confirmed the effect of experiential knowledge to the cost of knowledge translation. Moreover the results showed that product complexity has an effect to the cost of knowledge translation via knowledge development

process. So, even though the hypothesized model did not receive sufficient supports from the statistical analysis (not sufficient R^2 value), this research is quite significant as an explorative analysis of knowledge translation in the internationalization process of firms. In future research it can be fruitful to develop an integrative model for emphasizing both dimensions of knowledge creation and transfer, the characteristics of knowledge and the knowledge development process.

Secondly, our tentative results support our discussion about knowledge translation that firms have to modify and assimilate other's knowledge or their own knowledge for using it in new assignments, because knowledge always has its own specific context and unique development in interaction with others. Firms have to adjust that knowledge, which is developed in another context, to the new purpose and situation.

In relation to this, a specific context and purpose of knowledge is included in the knowledge itself. In order to understand the context of knowledge, firms have to understand earlier organization of knowledge source. It can be accomplished by several interactions with knowledge source and that is the reason of that knowledge translation perspective emphasizes modification and development process.

More research is suggested. Firstly, while we discussed quite a lot of knowledge creation and translation, discussion about knowledge itself was not enough. For example, what is knowledge and how can we perceive it? Secondly, qualitative studies may provide us with more detailed information concerning the mechanisms in the knowledge translation process. Specific case study of knowledge translation in internationalization of firms will be useful to understand this phenomena more precisely.

REFERENCES

- Cavusgil, S.T. 1980. On the internationalization process of firms. *European Research*, 8(November): 273- 81.
- Choi, C. J. & Lee, S. H., 1997, A Knowledge-Based View of Cooperative Interorganizational Relationships, In eds. Beamish, P. W. & Killing, J. P., 1997, *Cooperative Strategies: European Perspectives*, The New Lexington Press, San Francisco.
- Choi, S.-G. & Eriksson, K., 2000, forthcoming, The Internationalization Process as Knowledge Translation in International Business Relationships, in Håkansson, H. and Johanson, J. (eds.) *Learning in Business Networks*, Oxford: Elsevier Science.
- Czinkota, M. & Johnston, W. J. (1981). Segmenting U. S. firms for export development. *Journal of Business Research*, 9 (4), 353-366.
- Eriksson, K., Johanson, J., Majkgård, A. & Sharma, D. 1997. Experiential knowledge and cost in the internationalization process, *Journal of International Business Studies*, 28(2): 337-360.
- Eriksson, K., Johanson, J., Majkgård, A. & Sharma, D. 2000a forthcoming, The usefulness of network relationship experience, in Håkansson, H. & Johanson, J. (eds.) *Learning Business Networks*, Oxford: Elsevier Science.
- Eriksson, K., Johanson, J., Majkgård, A. & Sharma, D. 2000b Time and experiential knowledge in the internationalization process, *Zeitschrift Fur Betriebswirtschaft*, forthcoming.
- Forsgren, M., 1997, The Advantage Paradox of the Multinational Corporation, In *The nature of the international firm; Nordic contributions to international business research*, eds. Björkman, I. and Forsgren, M., Handelshojskolens Forlag, Copenhagen.
- Hamel, G. 1991. Competition for competence and inter-partner learning within international strategic alliances, *Strategic Management Journal*, 12: 83-103.
- Inkpen, A. C. & Beamish, P. W., 1997, Knowledge, Bargaining power, and the instability of international joint ventures, *Academy of Management Review*, 22(1): 177-202.
- Johanson, J. & Vahlne, J.-E. 1977. The internationalization process of the firm - A model of knowledge development and increasing foreign market commitments. *Journal of International Business Studies*, 8(1): 23-32.
- Jöreskog, K.-G. & Sörbom, D. 1993. *LISREL 8: Structural Equation Modeling with the SIMPLIS Command Language*. Chicago: Scientific Software Internationals.
- Kogut, B. & Zander, B., 1993, Knowledge of the firm and the evolutionary theory of the multinational corporation, *Journal of International Business Studies*, 24(4): 625-646.
- Lord, F. C. & Novick, M. R. (1968). *Statistical Theories of Mental Test Scores*, Reading, MA: Addison-Wesley.

- Luo, Y. 1999. Time-based experience and international expansion: The case of an emerging economy, *Journal of Management Studies*, 36 (4): 505-534.
- Lyles, M. A. & Salk, J. E. 1997, Knowledge acquisition from foreign parents in international Joint Ventures; An empirical examination in the Hungarian context, In *Co-operative strategies; European perspectives*, eds. Beamish, P. W. & Killing, J. P., The New Lexington Press, San Francisco.
- Madhok, A., 1997, Cost, value and foreign market entry mode: The transaction and the firm, *Strategic Management Journal*, 18: 39-61.
- Majkgård, A. & Sharma, D.D. 1998. Client-following and market-seeking strategies in the internationalization of service firms, *Journal of Business-to-Business Marketing*, 4(3): 1-41.
- Makino, S. & Delios, A. 1996. Local knowledge transfer and performance: Implications for alliance formation in Asia, *Journal of International Business Studies*, 27(5): 905-927.
- Mansfield, E. & Romeo, A. 1980. Technology transfer to overseas subsidiaries by U.S.-based firms, *The Quarterly Journal of Economics*, 95: 737-750.
- Marschan-Piekkari, R., Welch, D. & Welch, L. 1999. In the shadow: The impact of language on structure, power and communication in the multinational, *International Business Review*, 8 (4): 421-440.
- Penrose, E. T., 1959, *The Theory of the Growth of the Firm*, Oxford: Basil Blackwell.
- Shostack, G.L. 1987. Service positioning through structural change. *Journal of Marketing*, January: 34-43.
- Simonin, B. L., 1999. Ambiguity and the process of knowledge transfer in strategic alliances, *Strategic Management Journal*, 20(7): 595-623.
- Teece, D., 1977. Technology transfer by multinational firms: The resource costs of transferring technological know-how, *Economic Journal*, 87: 242-261.
- Teece, D., 1981. The market for know-how and the efficient international transfer of technology, *The Annals of the American Academy of Political and Social Science*, 458: 81-96.
- Zander, U. & Kogut, B., 1995, Knowledge and the Speed of the Transfer and Imitation of Organizational Capabilities: An Empirical Test, *Organization Science*, 6(1): 76-92.