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Address

EFI, Box 6501, SE-113 83 Stockholm, Sweden • Website: www.hhs.se/efi/
Telephone: +46(0)8-736 90 00 • Fax: +46(0)8-31 62 70 • E-mail efi@hhs.se

INTERACTION ACROSS BORDERS

A study about experiential knowledge development
in internationalizing SMEs

Emilia Rovira Nordman



EFI THE ECONOMIC RESEARCH INSTITUTE



Dissertation for the Degree of Doctor of Philosophy, Ph.D
Stockholm School of Economics 2009.

Keywords:

Interaction, Business relationships, SMEs,
Born globals, Internationalization modes,
Business networks, Personal networks,
Personal interaction

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ISBN 978-91-7258-812-7

Cover photo: Matton Bildbyrå

Author photo: Nils Nordman

Printed in Sweden by:

Intellecta Infolog, Göteborg 2009

Distributed by:

EFI, The Economic Research Institute
Stockholm School of Economics
Box 6501, SE-113 83 Stockholm, Sweden
www.hhs.se/efi

PREFACE

This report is a result of a research project carried out at the Centre for Marketing, Distribution and Industry Dynamics at the Economic Research Institute at the Stockholm School of Economics.

This volume is submitted as a doctor's thesis at the Stockholm School of Economics. As usual at the Economic Research Institute, the author has been entirely free to conduct and present her research in her own ways as an expression of her own ideas.

The institute is grateful for the financial support which has made it possible to fulfill the project. The institute would like to thank the Jan Wallander and Tom Hedelius' Foundation, Handelsbanken.

Filip Wijkström
Director of the Economic Research Institute
at the Stockholm School of Economics

Björn Axelsson
Director at the Centre for Marketing,
Distribution and Industry Dynamics
at the Stockholm School of Economics

Acknowledgments

This dissertation would not have been completed without the help and assistance of firms, faculty, friends, and family. I would, therefore, like to express my gratitude to them for their support during my dissertation process.

First, I would like to thank the founders and managers at the numerous SMEs all over Mälardalen who have been generous with their time and have given me insights into their international operations. This dissertation could never have been written without your support.

I consider myself to be very fortunate to have had the opportunity to work with the various members of my dissertation committee. I would first like to express my gratitude to the late Associate Professor Anders Blomstermo, who gave me the opportunity to become a Ph.D. student. Anders had a special ability to transfer the enthusiasm he felt about conducting research, and I will always regret that I did not get the chance to know him better.

Professor Dharma Deo Sharma has provided me with excellent supervision. Deo has been a firm and supportive primary supervisor to me throughout this process and has always given me the freedom to pursue independent ideas. I want to thank Deo for always making me feel welcome whenever I barged into his office with questions and for expending great effort to improve the quality of this dissertation.

Assistant Professor Angelika Lindstrand has also been an outstanding supervisor. From the beginning, she has always been exceptionally generous with her time and provision of good ideas. I would especially like to thank Angelika for patiently granting my last-minute reading requests and for promptly getting back to me with constructive comments and valuable suggestions. Thank you also for the constant encouragement and for your efforts to keep me focused on the important issues.

While writing this dissertation, I have also had the great privilege of receiving assistance from both Professor Lars-Gunnar Mattsson and Professor Jan Johanson. I am deeply grateful to Lars-Gunnar for investing his time and energy in reading so many versions of my papers and dissertation summary drafts. His insightful comments often made me rethink how I presented my ideas. Thank you for your constructive feedback and generosity.

I am also very grateful for Janne's encouragement during all stages of the dissertation-writing process, and I always felt uplifted after meeting with him. Thank you so much for investing your time and for sharing your great ideas about how to improve my work.

Furthermore, I would like to express my gratitude to Dr. Niklas Arvidsson for his careful reading of my dissertation draft and his constructive comments about how to improve it at the internal defense seminar in September 2009. Moreover, I would like to thank the numerous anonymous reviewers who have read through and commented on the various papers that are included in the dissertation. I have benefited greatly from their advice.

Sara Melén and I started our Ph.D. studies at the same time, and throughout our dissertation processes, Sara has been the best colleague imaginable. She has always helped me solve the problems that emerged and listened when I needed to talk. Sara, thank you for offering your friendship and guidance, for providing endless amounts of fun at stressful times, and for co-authoring so many papers with me.

I am also particularly grateful for the many diversions I have enjoyed by sharing a room with my friends and colleagues, Daniel Nilsson and Daniel Tolstoy. Without them, I would not have looked forward to going to work as much as I did. Thank you for participating in numerous exciting discussions and fun outings and for providing so much needed humor and entertainment during this process.

Being a part of the research project “Internationalization in Networks” (Inet) with Kent Eriksson, Jukka Hohenthal, Sara Jonsson, Jessica Lindbergh, Angelika Lindstrand, Angelika Löfgren, Sara Melén, Dharma Deo Sharma, and Daniel Tolstoy has provided me with the opportunity to work with quantitative data and learn more about this type of research. Thank you for your feedback and encouragement during this process.

Furthermore, I would like to extend my gratitude to my former and current colleagues at the Department of Marketing and Strategy for engaging me in stimulating, enjoyable discussions and for providing me with support and valuable feedback. Special thanks to my fellow Ph.D. students, with whom I have been able to share the ups and downs of the dissertation-writing process. Thank you for all the good times we have shared during these past couple of years.

In addition to working on this dissertation, I have, over the past couple of years, worked with the SSE Ph.D. program in business administration. I have also been involved in teaching for the SSE bachelor’s degree program in business and economics. Even though combining dissertation work with other tasks has been very stressful at times, I am glad to have had the opportunity to learn about so many new and important aspects of academic life during this period. I particularly want to thank Per Andersson, Carina Johansson, Catharina Melian, Anna Nyberg, Lovisa Näslund, Örjan Sölvell, Marie Tsujita Stephenson, and Richard Wahlund for being so helpful and showing me the ropes.

I am very grateful for the way that my friends have taken an interest in my work. More importantly, they have allowed me to let off steam. I risk doing them a disservice by not mentioning all of them here but plead limitation of space. Still, I particularly want to thank my splendid and imaginative friends, Jonas Bylund, Jenny von Knorring, Ylva Mälarstig, and Anna Nord, for always coming up with such nice activities.

During the dissertation process, my family was always there to remind me to enjoy life. I would especially like to thank my parents, Annika and Magin Rovira, for providing me with nice diversions and inviting me to many family dinners.

Finally, this dissertation would not have been possible without my wonderful husband, Nils Nordman, whose support and encouragement have helped me overcome many setbacks. I cannot express enough gratitude for your love, sacrifice, and ability to fake an interest in my research in a convincing manner. You and Måns could not possibly mean more to me because you already mean everything.

Emilia Rovira Nordman
Solna, November 2009

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Introduction

At the end of the 1990s, a large international pharmaceutical company was planning to terminate one of its largest research projects. The head of the research department strongly argued for creating a separate firm to keep pursuing the project. Sanctioned by the large pharmaceutical company, a new firm (here called Biocorp) was therefore founded in January 2000. Biocorp aimed to develop and sell products for microfluidic solutions in the life sciences industry. The management of Biocorp consisted of a group of employees from the large pharmaceutical company, who, combined, had about 15 to 20 years of industrial experience, as well as solid experience in managing international operations. They decided that Biocorp needed to set up its own sales organizations in the most important target markets at least 12 to 18 months before the products were ready to hit the market. The establishment of sales subsidiaries was necessary for allowing close interaction in local network relationships, which would provide sufficient feedback regarding potential customers' needs for products and applications.

During their careers, the different members of the management team had, moreover, developed large international personal and business networks. By using these relationships as a springboard, Biocorp could rapidly internationalize. Just one year after the firm was formed—before it even had any product ready to sell—Biocorp's first foreign sales subsidiary was established in the United Kingdom. The sales subsidiary was formed around an Englishman who was an old colleague of Biocorp's marketing manager. This locally rooted manager had many useful network connections in Great Britain, and by interacting with them, he brought Biocorp its first British customers. Shortly after Biocorp's start, two additional sales subsidiaries were established, one in the United States and one in Germany.

From the start, Biocorp's strategy was to open its own sales subsidiaries in the most important target markets and let distributors handle the rest. As in the case of the English manager, all of the local sales staff members in the foreign sales subsidiaries were recruited locally. These staff members were integrated in local networks and, therefore, had the necessary knowledge about how to interact in local business relationships.

Interaction Across Borders

The case of Biocorp reflects the phenomenon that is the focus of this dissertation: the influence of interaction on the experiential knowledge development and internationalization of small and medium-sized enterprises (SMEs). The case shows that the management team's previously developed experiences and networks influenced which means of interaction Biocorp applied in different foreign markets during its internationalization. The means of interaction chosen also affected the future experiential knowledge development and internationalization of the firm.

The case of Biocorp shows that during the course of their internationalization, SMEs face many new challenges. This dissertation discusses how internationalizing SMEs go about overcoming some of the obstacles that may accrue throughout this process. To do this, the dissertation highlights certain interaction means: high-commitment internationalization modes, low-commitment internationalization modes, business network relationships, personal network relationships, and personal interaction. (These concepts are further explained and defined in the following section of the dissertation). The dissertation builds on the argument that the ability of internationalizing SMEs to leverage its means of interaction in foreign business relationships spurs the development of experiential knowledge (i.e., a tacit knowledge¹ resource that can be developed only through interaction in foreign business relationships in a foreign market), which ultimately pushes their internationalization forward.

The relationship between experiential knowledge development and increased internationalization has been emphasized in many previous studies (Eriksson, Johanson, Majkgård, & Sharma, 1997; Erramilli, 1991; Johanson & Vahlne, 1977). Although interaction is necessary for internationalization, research has not yet supplied in-depth insights into how interaction influences experiential knowledge development and internationalization. Against this background, it is vital to investigate the relationships that exist among interaction, experiential knowledge development, and internationalization in SMEs. By writing this dissertation, I seek to enhance the understanding of how SMEs internationalize and, in so doing, contribute to theory on the behavioral internationalization processes of firms by unraveling their underpinnings in the dynamic relationships among interaction, experiential knowledge development, and internationalization. I also seek to contribute to the development of theory that focuses on the rapid internationalization of SMEs.

The next section of the introduction uses the Biocorp case to illustrate further the abovementioned concepts. This case is also used to highlight how important it is for SMEs to interact in local business relationships so as to develop experiential knowledge and further their internationalization.

Interaction via Foreign Network Relationships

Biocorp is an example of the type of firm that is the focus of this dissertation—namely, SMEs that are faced with the challenge of interacting in business relationships in foreign markets during their internationalization. SMEs are defined as firms with a maximum of 250 employees (OECD, 2002). Internationalization is regarded as “a process in which firms gradually increase their international involvement” (Johanson & Vahlne, 1977, p. 23). Hence, internationalizing SMEs are smaller firms that gradually increase their involvement in foreign markets.

¹ Tacit knowledge resides in the mind, behavior, and perception, and as such, it evolves from interaction and requires skill and practice (Nonaka, 1994).

A business relationship can be defined as a mutually oriented interaction between two reciprocally committed parties (Agndal & Nilsson, 2007; Håkansson & Snehota, 1995). Hence, interaction is necessary for the development of business relationships. Wagner (1994) defined interaction as “reciprocal events that require at least two objects and two actions. Interaction occurs when these objects and events mutually influence one another” (p. 8). Although Wagner’s definition of interaction captured the major components of reciprocity and multiple actors, it did not mention the exchange of resources that is the foundation for interaction between business relationships. Homans (1958), however, described interaction as a process in which two participants carry out activities directed toward one another and exchange resources. On the basis of these ideas, interaction is defined as a process that occurs when two or more firms influence each other, for example, by engaging in knowledge resource exchanges. Interaction means are defined as the interaction vehicles that firms use to influence other firms.

The Biocorp case indicates that it is challenging for an internationalizing SME to interact in business relationships in foreign markets. Differences in knowledge about the technology that Biocorp sells and differences in ways of conducting business in different local markets are examples of the difficulties that Biocorp faces in its internationalization. To overcome these difficulties, Biocorp’s management must use its pre-existing knowledge and interact with its network of personal and business relationships. A business network is regarded as a set of two or more connected business relationships (Emerson, 1981), whereas personal networks are defined as networks characterized by personal, as opposed to business, relationships (McDougall, Shane, & Oviatt, 1994).

Previous internationalization studies have highlighted the importance of interacting in business networks for the internationalization of firms (Blankenburg Holm, Eriksson, & Johanson, 1996; Blomstermo & Sharma, 2003; Chen & Chen, 1998; Coviello & Munro, 1997; Johanson & Mattsson, 1988; Majkgård & Sharma, 1998). For example, firms often interact with business network partners as a way to extend and integrate their presence in certain foreign markets. Interaction in networks can also help internationalizing firms expose themselves to new opportunities, obtain knowledge, learn from experiences, and benefit from the synergetic effects of pooled resources (Chetty & Blankenburg Holm, 2000). Much of the knowledge used by a firm comes from interaction with other firms in business networks (Blomstermo & Sharma, 2004; Granovetter, 1985). Empirical evidence has even shown that experience accumulated within networks has often served as the primary vehicle for the development and performance of firms (Blomstermo, Eriksson, Lindstrand, & Sharma, 2004; Dyer & Singh, 1998).

As previously mentioned, both business network relationships and personal network relationships are regarded in this dissertation as interaction means that SMEs can use to further their experiential knowledge development and internationalization. In addition to the use of business network relationships, previous studies have highlighted how important it is for newly

started and smaller firms like Biocorp to draw on the personal networks of their management teams during their internationalization (Crick & Spence, 2005; Moen, Gavlen, & Endresen, 2004). The importance of personal network relationships as a means of interaction has been particularly highlighted in studies that focus on internationalizing SMEs that experience early and rapid internationalization almost from their inception. In the literature, these firms have been called born global firms (Andersson & Wictor, 2003; Knight & Cavusgil, 1996; Madsen & Servais, 1997) or international new ventures (McDougall et al., 1994; Oviatt & McDougall, 1994). Here, the concept of born globals is used when referring to these early and rapidly internationalizing firms. Influenced by other scholars (Autio, Sapienza, & Almeida, 2000; Knight & Cavusgil, 1996), I define a born global as a firm that, from inception, discovers and exploits opportunities in multiple countries.

One factor that explains why firms can be international from early in their development could be that their founders and managers possess an unusual constellation of competences. These founders and managers can, therefore, be considered key employees who drive the internationalization of the firm. Previous research about the pre-export activity of firms has also suggested that the key employees of small firms may have gained experience from previous international ventures, which can be useful in future endeavors of internationalization (Melén, 2009; Wiedersheim-Paul, Olson, & Welch, 1978). These personal network relationships consist of customers and contacts, with whom key employees can interact to acquire business advice and discover opportunities when starting the new firms (Crick & Jones, 2000; Sharma & Blomstermo, 2003). Nummela (2004), however, argued that the significance of the personal network probably decreases as a firm grows. Relationships with new actors are established to acquire necessary resources, and at the same time, some old relationships may be dissolved.

The research highlighting the importance of business and personal networks is supported by the case of Biocorp, as this firm's newness and lack of organizational experience is compensated for by an abundance of managerial experience. By interacting in their previously developed personal network relationships, Biocorp's management receives help in recruiting new staff members in local markets. This staff facilitates the interaction between Biocorp and new business network relationships in the most important markets.

Interaction via Internationalization Modes

The foreign markets on which Biocorp focuses can be seen as arenas within which business relationships interact with each other (Håkansson, 1982; Turnbull, Ford, & Cunningham, 1996). The interaction between these parties enables an organization to learn what is required by its counterparts, as well as what it can expect in return. When interacting, each party in a business relationship will increase his or her knowledge and experience—not only regarding the interaction itself but also about the counterpart in the business

relationship (Ford, Håkansson, & Johanson, 1986). Experiential knowledge is, moreover, a resource that has been particularly highlighted in the behavioral internationalization process theories of the firm (Bilkey & Tesar, 1977; Johanson & Vahlne, 1977; Reid, 1981). The Uppsala behavioral internationalization process theory (i.e., the Uppsala theory) states that when a firm enters a new foreign market, it initially lacks experiential knowledge about how to conduct business there (Johanson & Vahlne, 1977). However, this knowledge is gradually built up as the firm acquires experience while interacting in local business relationships and participating in business exchanges in local markets. As the level of experiential knowledge increases, uncertainty about the market is reduced, and the firm dares to increase its resource commitments to that specific market, for example, in the form of time and travel costs.

For firms to want to make commitments to certain markets, trust must first be induced. Therefore, trust can be seen a prerequisite for commitment (Morgan & Hunt, 1994), as well as a particularly important ingredient for successful learning and the development of new knowledge in business relationships (Johanson & Vahlne, 2009). In this dissertation, trust is defined as the “willingness to rely on an exchange partner in whom one has confidence” (Moorman, Zaltman, & Deshpande, 1992, p. 315).

When firms internationalize, they use different internationalization modes; this refers to the organizational method used to enter foreign markets (Johanson & Wiedersheim-Paul, 1975). These internationalization modes differ in terms of the resource commitments they require from a firm. Different internationalization modes can also be seen as different interaction means that firms can employ to interact in foreign business relationships in certain markets. Internationalization modes can include direct exporting, exporting via foreign intermediaries, licensing and franchising, strategic alliances/joint ventures, and sales or manufacturing subsidiaries. In line with previous studies, exporting modes (including licensing and franchising) are categorized as low-commitment internationalization modes, whereas strategic alliances, joint ventures, and subsidiaries are categorized as high-commitment internationalization modes (Agndal & Chetty, 2007; Pedersen & Petersen, 1998).

The Uppsala theory states that an increased level of interaction and development of experiential knowledge about one foreign market leads to an increase in resource commitments to even more distant markets. As companies acquire more experiential knowledge about foreign markets, they are able to progress to other and more highly committed modes of internationalization, which, in turn, require increased resource commitments. This theory implies that the internationalization process is incremental and that a firm will internationalize gradually as its employees interact more in local business relationships and learn more about foreign markets (Johanson & Vahlne, 1977). Hence, experiential knowledge development is regarded as critical for the internationalization of firms (Bilkey & Tesar, 1977; Eriksson et al., 1997; Erramilli, 1991; Lindstrand, 2003a), and a vital task for internationalizing

SMEs is the development of experiential knowledge about foreign markets through interacting in the business and personal relationships of the employees.

Experiential Knowledge Development

Internationalizing SMEs must act in a world made up of networks, and interaction in network relationships is, therefore, an important means for SMEs to acquire and develop experiential knowledge (Scozzi, Garavelli, & Crowston, 2005; Van Gils & Zwart, 2004). The case of Biocorp brings empirical substance to the argument that interaction in different network relationships and the development of experiential knowledge resources are of significant importance for firms' internationalization. The experiential knowledge of Biocorp's management team has, for instance, taught them the importance of entering major foreign markets in a direct manner for successful internationalization to occur. Furthermore, by opening sales subsidiaries in the most important markets, Biocorp promotes rapid and direct interaction between its sales staff and the most important customers. Thereby, Biocorp can develop experiential knowledge about the markets and receive immediate feedback regarding potential customers' needs for their products. As a consequence, Biocorp can also develop product applications that fulfill their customers' wishes. Through these kinds of interactions with customers or suppliers, firms often obtain access to external knowledge (Turnbull et al., 1996) that they can combine with their existing knowledge. Prior related knowledge also facilitates the development of new knowledge (Eriksson & Chetty, 2003). This new knowledge can be used, for example, to develop new products or technologies in cooperation with foreign business relationships because the bulk of knowledge development—such as product or technological development—does not take place solely on the supplier or customer side in a business relationship but rather interactively between them (Thorpe, Holt, Macpherson, & Pittaway, 2005). In some situations, knowledge does not even exist until suppliers and customers have developed it together (Johanson & Vahlne, 2009).

In the case of Biocorp, the management team based its internationalization decisions on their own experiential knowledge. Another way for firms to acquire knowledge is through grafting (Forsgren, 2002). Huber (1991) described learning through grafting as the process of learning through the hiring of new staff members who possess knowledge not previously available within the organization. The experiential knowledge that Biocorp's management team had developed during previous work positions can also be regarded as their human capital. The human capital of employees encompasses the resources embodied in the skills and knowledge that they have previously developed (Coleman, 1988). Human capital is thus traditionally constructed from components such as formal education and experience (Davidsson & Honig, 2003).

Personal Interaction

Within all business relationships, a motivation for interaction between firms is communication about the resources that the firms are allocating to or using in the relationships (Wynstra, Axelsson, & Van der Valk, 2006). Previous research about interaction has shown that communication media differ in the richness of the information processed. The quality of communication media is based on the media's feedback capability, the utilized communication channels, language variety, and personal focus; the more a medium incorporates these characteristics, the richer it is (Daft & Lengel, 1986; Suh, 1999). In the hierarchy of media richness, face-to-face communication is richest, followed by telephone, e-mail, and print communications (Treviño, Webster, & Stein, 2000). The top modes of rich modality interaction (i.e., face-to-face communication and telephone communication) are defined as personal interaction. Previous research has shown that personal interaction has unique traits that can enhance the development of tacit knowledge, which is based on experience (Murray & Peyrefitte, 2007; Tödting & Kaufmann, 2001).

Because different means of interaction differ in quality (Daft & Lengel, 1986; Suh, 1999), the choice of which interaction means to use influences business relationships. Previous research has also shown that increased frequency of interaction has an effect on business relationships (Heide & Miner, 1992). Building on this research, the quantity of interaction is regarded as a resource commitment in the form of time (frequency of interaction), and the quality of interaction is regarded as a resource commitment in the form of interaction mode. To measure the quality and quantity of interactions in this dissertation, the construct of personal interaction was used. Personal interaction is seen as higher in quality than leaner types of interaction (e.g., email). Thus, the more time a firm spends interacting in business relationships via face-to-face and telephone meetings, the higher the quantity and quality of the interaction.

When firms internationalize, they use different internationalization modes to achieve different qualities and quantities of interaction. The case of Biocorp shows that the management team's decision to invest in highly committed internationalization modes by opening their own sales subsidiaries in the most important markets forces them to make large resource commitments to specific foreign markets. By investing in these high-commitment internationalization modes, the management can facilitate personal interaction with important foreign business partners. Firms like Biocorp that have their own staff present in the most important markets create a higher quantity and quality of interaction in important business relationships than do firms that, for example, only internationalize by using low-commitment direct export modes.

Dissertation Purpose

The goal of this dissertation is to explore how SMEs use interaction to develop experiential knowledge and thereby promote internationalization. A review of existing theory about the knowledge development and internationalization of firms indicates that learning about how to conduct business in foreign markets and how to interact in business relationships in a specific market are regarded as key issues in firms' internationalization processes from both a theoretical (Johanson & Vahlne, 1990) and a practical perspective. Interaction with business counterparts to develop stable business relationships is also considered to be a time-consuming and complex process that requires a great deal of resources from a firm (Johanson & Vahlne, 2003). Seen in this light, SMEs' lack of both financial and human capital resources in comparison with large firms can, of course, be a serious impediment, which may hamper their experiential knowledge development and internationalization. There are, however, studies that show that a firm's size does not necessarily correlate with its international activity (Reuber & Fischer, 1997; Wennberg & Holmquist, 2008). Even though SMEs tend to have limited funds to use for research and development (R&D) or to speed up production processes, their flexibility, lack of bureaucracy, rapid decision-making, and motivated employees may give them an advantage over larger firms (Allocca & Kessler, 2006; Koskinen & Vanharanta, 2002). Because small firms generally are more adaptive than large firms, they may also find it easier to find niches in their interaction with highly internationalized business networks (Johanson & Mattsson, 1987). To achieve these advantages, SMEs often internationalize in different ways than do larger, more resource-rich firms, for example, through the use of key employees' experiential knowledge and through interaction with personal network relationships.

Given the differences between internationalizing SMEs and larger firms, internationalizing SMEs require academic investigation in their own right. More research has also been requested regarding knowledge development in SMEs, as opposed to the multitude of studies that investigate knowledge development in the context of larger firms (Van Gils & Zwart, 2004). Researchers interested in the field of SME internationalization have, moreover, requested more longitudinal studies about born global firms in particular (Coviello & Jones, 2004; Rialp, Rialp, & Knight, 2005). Furthermore, multiple-method studies that could provide a fuller picture of the phenomenon of SME internationalization have been called for (Coviello & McAuley, 1999). Chaston, Badger, and Sadler-Smith (1999) even argued that SME research requires both quantitative and qualitative studies to permit more holistic and realistic conclusions.

Although previous literature has indicated that interaction in business relationships influences experiential knowledge development and internationalization (see, for example, Eriksson et al., 1997; Eriksson, Johanson, Majkgård, & Sharma, 2000; Erramilli, 1991; Johanson & Vahlne, 1977, 2009; Lindstrand, 2003a), we have limited knowledge about the particular interaction mechanisms driving this process and the various

outcomes that result. The investigation of how SMEs interact in foreign business relationships, moreover, is highly relevant if we want to understand the challenges in developing experiential knowledge that these firms face in their internationalization. Hence, the purpose of this dissertation is *to enhance our understanding of internationalizing SMEs by investigating how interaction relates to their experiential knowledge development and internationalization.*

To fulfill this purpose, I have conducted both longitudinal qualitative studies and quantitative studies about the interaction, experiential knowledge development, and internationalization of SMEs. Through these studies, this dissertation seeks to contribute to our holistic understanding of internationalizing SMEs and to fill research gaps that have been identified concerning these firms.

Key Research Questions

Furthermore, this dissertation intends to answer two key research questions related to the purpose. These questions are also built on the body of research that discusses interaction, internationalization, networks, and knowledge development of firms.

Research Question One

The Uppsala theory describes internationalization as a process of accumulating knowledge of markets and institutions abroad by interacting in business relationships in these markets. The accumulation of knowledge influences firms to internationalize incrementally as their experiential knowledge of markets increases (Johanson & Vahlne, 1977). More recent studies, however, have argued that incremental internationalization theories cannot explain the internationalization of all SMEs (Crick & Jones, 2000; Lituchy & Rail, 2000; Madsen and Servais, 1997; Oviatt & McDougall, 1994, 1997). This is especially true for the international progress of firms—namely, born global firms—that must adapt very rapidly to new foreign market conditions during their internationalization.

An argument between the Uppsala theory and many born global studies concerns whether firms are proactive or reactive in their internationalization behavior. The Uppsala theory claims that interaction in foreign business relationships can provide firms with increased knowledge of foreign markets and of how to conduct business in these markets. The discovery of opportunities is seen as a reactive process because such a discovery cannot result from an active search. In contrast to firms that follow a stepwise internationalization process, born globals are known for their simultaneous use of multiple and different modes of internationalization (Andersson & Wictor, 2003; Crick & Jones, 2000). Hence, these firms can be said to use different means of interaction simultaneously to facilitate a rapid internationalization. Research has also indicated that born globals follow a proactive internationalization approach (Madsen & Servais, 1997; Oviatt &

McDougall, 1994, 1997). In summary, differences in opinion exist regarding the means of interaction that internationalizing firms employ when interacting in foreign markets: Do SMEs follow incremental or more rapid and simultaneous paths? Are these firms reactive or proactive in their internationalization behaviors? This dissertation seeks to bridge these gaps in the research.

In addition to further investigations of whether internationalizing SMEs are reactive or proactive, business scholars have requested additional research into which internationalization modes are used by rapidly internationalizing firms in their continued internationalization (Liesch, Weerawardena, Sullivan Mort, Knight, & Kastle, 2007). By including a qualitative study that investigates the continued internationalization of born globals, this dissertation aims to delve deeper into these research areas.

In contrast to the Uppsala theory, which emphasizes the firm as the unit of analysis (Johanson & Vahlne, 1977; Johanson & Wiedersheim-Paul, 1975), studies about the rapid internationalization of SMEs have shown that the internationalization behaviors of these firms are closely connected to their key employees, whose previously acquired skills and knowledge may contribute to a rapid internationalization (Madsen & Servais, 1997; McDougall et al., 1994). Firms can thus substitute managerial experience for a lack of organizational experience (Sapienza, Autio, George, & Zahra, 2006). Opposing arguments have also been put forward concerning the different means of interaction that employees use to further a firm's internationalization. Which play a greater role in the internationalization of born globals—employees' business networks (Coviello, 2006) or personal networks (Andersson & Wictor, 2003)?

To fill these gaps in the research, my first research question asks the following: *How do different means of interaction that SMEs employ in their foreign business relationships relate to their experiential knowledge development and internationalization?* The specific means of interaction that are investigated are high-commitment internationalization modes, low-commitment internationalization modes, business network relationships, personal network relationships, and personal interaction.

Research Question Two

Another argument in the internationalization literature concerns the question of how the quantity and quality of interaction influence the experiential knowledge development and internationalization of firms. To reiterate, the quantity of interaction is regarded as resource commitment in the form of time (frequency of interaction), and the quality of interaction is regarded as resource commitment in the form of interaction modes, where personal interaction is seen as higher in quality than leaner types of interaction. Hence, SMEs that invest in high-quality and quantity interactions expend a lot of resources—in the form of, for example, time and travel costs—to strengthen their foreign business relationships.

On the basis of studies by Johanson and Vahlne (1977, 1990, 2003, 2009), experiential knowledge development can be seen as the process of developing knowledge through interaction in foreign business relationships. This idea indicates that the more investments a firm makes to improve the quality and quantity of interaction in business relationships in a certain foreign market, the more experiential knowledge can be developed. This, in turn, influences the firm's internationalization in a positive manner.

In contrast to the ideas presented in the Uppsala theory, some researchers question whether the accumulation of experiential knowledge leading to incremental internationalization is even necessary for internationalizing SMEs because of the emergence of new information and communication technologies (ICTs), such as e-mail, that were not used during the 1970s but are frequently used today. In an article from 2000, Lituchy and Rail argued that incremental theories of internationalization no longer apply to small businesses because of the improved communication systems, such as the Internet, that allow firms to interact from a distance.

There are, however, researchers who argue that a high quantity and quality of interaction are still very important for firms because of the unique traits that can enhance the development of experiential knowledge, which is hard to formalize and communicate (Murray & Peyrefitte, 2007; Tödtling & Kaufmann, 2001). Personal interaction has also been argued to be more efficient than other means of interaction, particularly when the exchange of information involves uncertainty (Wiedersheim-Paul et al., 1978).

A firm's choice of internationalization mode will influence the quality and quantity of interaction in foreign business relationships because different means of interaction facilitate interaction to different degrees. Personal interaction best enables the development of experiential knowledge that has been identified as critical for the internationalization of firms. By investing in high-commitment internationalization modes (e.g., foreign sales subsidiaries that enable a direct and continuous presence in foreign markets), a firm can increase its opportunities for personal interaction in important foreign business relationships as well as opportunities for developing important experiential knowledge about foreign markets.

The differing views presented above indicate that more research is needed to investigate whether there is still a need for high quality and quantity of interaction to facilitate the experiential knowledge development and internationalization of SMEs. To address this issue, my second research question asks the following: *How do the quality and quantity of interaction between SMEs and other parties in their foreign business relationships relate to their experiential knowledge development and internationalization?*

Delimitations

In fulfilling the purpose of this dissertation, I will discuss previous research that has had a bearing on the current view of SME internationalization. This research can be organized under three theoretical pillars: interaction and

internationalization research, network research, and knowledge research. Within business literature, these research tracks have generated an extensive number of studies. Before an overall theoretical framework can be formed to describe SME internationalization, a discussion about the delimitations is necessary.

First, the internationalization research discussed in this dissertation is built around the Uppsala theory. On the basis of Johanson and Vahlne's 1977 description of internationalization as a process in which firms gradually increase their international involvement, this dissertation measures internationalization as increased resource commitment to foreign markets. Increased commitment of resources can be regarded as anything from changing internationalization modes in a specific market (e.g., from a low-commitment mode like exporting to a high-commitment mode like a joint venture) to increasing travel to interact in foreign business relationships or developing technology or new products in cooperation with them. A firm can also increase its commitment of resources to foreign markets by appointing more staff members to manage the interaction in foreign business relationships. When investigating the increased resource commitment of the internationalizing SMEs, the focus of the dissertation is on the sales side of firms' internationalization. The supply side of internationalization is not thoroughly investigated. As in the Uppsala behavioral internationalization process view of the firm, I regard the firm, and not the individual, as the unit of analysis. I do consider the individual to be vital for the experiential knowledge development of firms; however, I believe that knowledge found in an individual can be transferred to organizations.

This dissertation focuses on experiential knowledge development in the relationships between firms and their foreign business partners. Hence, I do not discuss institutional aspects of experiential knowledge, such as knowledge about laws, governments, and norms in certain markets. Nor does the dissertation include any in-depth discussion about knowledge transfer processes.

Every working company exists within a complex network of interactions. This web of interactions has been described as being so complex and multifarious that it defies full description or analysis (Ford et al., 1986). This dissertation attempts to investigate how a few different means of interaction relate to the experiential knowledge development and internationalization of SMEs. The choice to focus on personal interaction is derived from the ideas that different modes of interaction differ in quality and quantity and that personal interaction can best enhance the development of tacit knowledge. Of course, other types of interaction, such as e-mail and other Web-based communication solutions, may also influence the experiential knowledge development and internationalization of SMEs; these matters are not, however, investigated in this dissertation.

Even though previous studies have indicated that both the use of foreign network relationships (Blomstermo et al., 2004; Dyer & Singh, 1998) and the use of knowledge about foreign markets (Yli-Renko, Autio, & Tontti,

2002) are positively related to the performance of internationalizing firms, this dissertation does not discuss how interaction in networks and experiential knowledge development influence the financial performance of internationalizing SMEs. To investigate these issues, numerous control variables that could affect the results would have to be taken under consideration. Examples of such control variables could be industry structure, economic climate, market characteristics, currency fluctuations, taxation effects, and strategic considerations, to mention only a few. These control variables are not checked for in the studies presented in this dissertation.

This dissertation's empirical focus is on internationalizing Swedish SMEs (e.g., biotech SMEs, high-tech SMEs, born global SMEs) and the issues that these firms face during their internationalization. The qualitative study is, furthermore, based on empirical material collected from firms within the Swedish biotech industry. Scholars interested in the biotech field have discussed the challenges faced by these firms. For example, the high costs of R&D (including clinical trials) often make the development of new products a lengthy and costly endeavor (Renko, Carsrud, Brännback, & Jalkanen, 2005). These high costs also make most biotech companies dependent on capital, which forces them to search for financial actors that are not opposed to taking risks and are willing to wait to see a return on their investment (Waxell & Malmberg, 2007). Because the aim of this study was to investigate the interaction, experiential knowledge development, and internationalization of these firms, the study has not focused on the multitude of other challenges that biotech companies, in particular, face in comparison with companies in other business areas. Furthermore, the dissertation does not include studies of large firms, nor of biotech, high-tech, or born global firms that are not considered to be SMEs.²

Structure of the Dissertation

This consolidated dissertation consists of a summary and a collection of six research papers. The summary, whose organization is depicted in Table 1, is divided into six chapters: (1) "Introduction," (2) "Theoretical Framework," (3) "Research Process and Research Design," (4) "Structure of the Papers," (5) "Discussion," and (6) "References." The last part of the summary contains an appendix. The second part of the dissertation contains the full-length versions of the six research papers.

The "Introduction" starts with a short case study that emphasizes the focal questions that will be addressed in the dissertation. A presentation of the empirical and theoretical settings under study follows. The dissertation's purpose and a description of the key research questions that it attempts to answer are then presented, followed by its delimitations and structure.

² Because born globals are typically young and have a relatively limited resource base, most born globals are SMEs (Knight, Madsen, & Servais, P, 2004).

The second chapter of the dissertation presents a theoretical framework that builds on previous studies within the research areas of interaction and internationalization, formation of networks, and knowledge development.

The dissertation's third chapter presents the research process and research design on which the dissertation is built. Because the dissertation builds on both qualitative and quantitative data collection methods, this part of the dissertation describes how data were collected and analyzed.

The fourth section introduces the six research papers that are included in the combined dissertation. This chapter shows the empirical settings, analyses, and results of the six papers. This review leads up to the concluding discussion in chapter five, which discusses the managerial implications of the dissertation, as well as implications for further research.

The last part of the dissertation contains the references and an appendix that consists of the full-length version of the questionnaire. The final part of the summary contains the full-length version of the six papers. Table 1 portrays the organization of the dissertation.

Table 1 Overview over the structure of the dissertation

Part 1: Dissertation summary	
Chapter 1: Introduction	Interaction across borders Dissertation purpose Delimitations Structure of the dissertation
Chapter 2: Theoretical framework	Interaction in business relationships Interaction in foreign markets Interaction in networks Interaction and the rapid internationalization of SMEs Interaction and experiential knowledge Theoretical summary
Chapter 3: Research process and research design	Ontological and epistemological positioning The qualitative study The quantitative study
Chapter 4: Introducing the papers	Presentations of papers 1-6
Chapter 5: Discussion	Findings and contributions Managerial implications Future research
Chapter 6: References	References
Appendix 1	The questionnaire
Part 2: The Research Papers	
Paper 1	The value of human capital for the networks of born globals
Paper 2	The impact of different kinds of knowledge for the

	internationalization process of born globals in the biotech business
Paper 3	The internationalisation modes of Born Globals: a longitudinal study
Paper 4	Face-to-face interaction in an age of information — necessary or not?
Paper 5	The effect of personal interaction on the international technology development of SMEs
Paper 6	The innovative product development of internationalising SMEs

Theoretical Framework

As stated earlier, the theoretical framework is built on three pillars of research: interaction and internationalization research, network research, and knowledge research. Building on these theoretical pillars, the framework discusses how the investigated means of interaction can be related to experiential knowledge development and the internationalization of small and medium-sized enterprises.

Interaction in Business Relationships

The idea that firms profit from interacting in more stable business relationships can be traced back to the 1950s. In 1958, Alderson stated the following:

Buyers and sellers meet in market transactions, each side having tentatively identified the other as an answer to its problem. The market transaction consumes much of the time and effort of all buyers and sellers. The market, which operates through a network of costless transactions, is only a convenient fiction which economists adopt for certain analytical purposes. Potentially the cost of transactions is so high that controlling or reducing this cost is a major objective in market analysis and executive education.
(p. 25)

Alderson (1958) was one of the first researchers to launch the idea that the cost of identifying a partner to cooperate with is high and that firms, therefore, need to find strategies for reducing this cost. Alderson, furthermore, stated that a routine transaction is something that saves both time and cost because it proceeds under a set of rules and assumptions established by previous negotiation. In his article, Alderson implied that losses in time and cost can be avoided if firms interact and cooperate with each other. Constant negotiations would become obsolete if firms became involved in interactions consisting of fixed transactions governed by sets of rules and assumptions.

The Interaction Approach

Interest in studying the benefits of cooperation between firms has increased drastically since Alderson wrote his 1958 paper. During the 1960s and 1970s, a group of Uppsala researchers performed studies that supported the idea that the business conducted between firms is not purely transactional in its nature. Instead, customers and suppliers are typically involved in stable, long-term relationships with each other (Axelsson & Håkansson, 1984; Forsgren & Kinch, 1970; Johanson, 1966; Laage-Hellman, 1997; Mattsson & Björkroth, 1978). Hence, instead of following the research traditions of that era and studying distinct and separate purchase behaviors, the Uppsala researchers recognized the need for further investigation of the patterns of interaction within supplier-customer relationships. On the basis of empirical studies in

multiple countries, a framework was proposed to guide the development of research on business-to-business markets; this became known as the *interaction approach* (Håkansson, 1982). The interaction approach is based on the idea that a majority of business purchases do not exist as individual events and, therefore, cannot be examined in isolation (Turnbull et al., 1996). Business purchases cannot, moreover, be viewed as processes consisting of an action by the supplier and a reaction (or lack thereof) by the customer. Instead, business markets can be seen as arenas within which suppliers and customers interact. The interaction approach also stipulates that firms are connected to each other via a number of exchanges. These exchanges, however, cannot happen without continuous interactions. When customers and suppliers are involved in business together under long-term conditions, there is an exchange of products, information, experiences, knowledge, wishes, and demands concerning quality, price, deliveries, and services. There are also social exchanges between the firms (Bergman & Johanson, 1978; Laage-Hellman, 1997).

Because both customers and supplier firms make investments in managing exchanges, both have an incentive to reduce their costs and increase their benefits by investing in their interaction with the other party and developing stable relationships. Within these relationships, adaptations often are made for the other firm; these may concern, for instance, special product design, new administrative routines, or new logistical systems (Håkansson, 1982; Johanson & Mattsson, 1988). A business relationship depends on the degree to which firms interact via exchanges and adaptations (Håkansson, 1982). Furthermore, when two firms interact in this way, they are cooperating with each other. The choice of cooperation partners and the choice to cooperate with these partners are determined by interplay between the internal resources of the firm and the external resources of the counterpart (Axelsson & Håkansson, 1984). A firm must continuously examine the ways in which it interacts with a relationship partner to determine whether that interaction reflects the requirements of both parties. Thus, firms are involved in a continuous analysis and planning of the breadth, depth, and closeness of their business relationships (Turnbull et al., 1996).

Jens Laage-Hellman (1997) described the exchange and adaptation processes between Japanese firms and their suppliers and customers in industrial markets and how the cooperation between these firms has been used to develop and commercialize new products. His studies revealed that for close technological cooperation to occur in these relationships, trust is particularly important. Laage-Hellman (1997) emphasized that trust is something that can be built only by interaction over time. For example, participants in a business relationship often perceive the need to get to know each other and to test each other's competence in limited exchange periods before embarking on more demanding cooperative projects. This incremental building up of cooperative relationships does not, however, develop spontaneously or without effort. Instead, there are many problems that must be handled. Many of these have to do with the interaction processes between the firms—for example, questions

about how the firms will manage the organization, control, and performance of exchanges and adaptations.

The purpose of this dissertation is to enhance our understanding of internationalizing SMEs by investigating how interaction relates to experiential knowledge development and internationalization. The interaction approach shows that close and lasting interaction between business partners is at the nexus of business relationships. Moreover, interaction is vital for the development of trust. When business partners interact, trust is developed over time, and in this process, experiential knowledge is also gained. Although research about the interaction approach originally focused on national studies, later studies showed that lasting interactions in business relationships are important both within countries and between country markets (Hallén, 1986). Hence, the ideas presented in the interaction approach were also implemented in other studies performed by researchers who were particularly interested in studying the internationalization processes of firms. These theories will be further discussed in the next part of the theoretical framework.

Interaction in Foreign Markets

Since the 1950s, interest in the international growth of firms has grown by leaps and bounds (Penrose, 1995). Current internationalization theories can broadly be divided into two types: the economic and process approaches (Benito & Gripsrud, 1992). Taking his starting point in the study of economics, Hymer (1960) argued that firms internationalize to exploit firm-specific advantages. Foreign direct investments, however, only occur when the benefits of exploiting the advantages in foreign markets outweigh the costs. Vernon (1966) described internationalization as something that occurs when firms start to develop new products and export them to new markets. When the demands of the new markets increase, the firms start to invest in production facilities in these markets. Thereby, firms can take advantage of low-cost production in certain markets. Also, Hennart (1982) emphasized cost explanations of internationalization in the transaction-cost theory, which describes “the economic man”—someone who has access to perfect information and will choose rational and cost-based solutions when making decisions. The economic aspects of internationalization are further emphasized in the noted theoretical contributions of the eclectic approach (Dunning, 1977) and internalization theory (Buckley & Casson, 1976). In brief, it can be said that both of these theories put forward the idea that firm-specific advantage is a precondition for successful internationalization because this advantage can be used to compensate for the disadvantages of being a foreigner in a market.

Around the same time as the studies mentioned above, behavioral internationalization process theories of the firm emerged. Rather than focusing on economic factors as the motivation for internationalization, the behavioral theories describe internationalization as an interaction process between firms in different countries and focus on learning as a predictor of international success (Bilkey & Tesar, 1977; Johanson & Vahlne, 1977; Reid, 1981). The reasoning

in this dissertation is built around the behavioral internationalization process theory developed in Uppsala during the 1970s and the ideas that this theory conveys.

The Establishment Chain

In 1975, Johanson and Wiedersheim-Paul, two researchers from Uppsala University, identified an empirical pattern of the order in which four Swedish firms internationalized. This pattern shows that Swedish firms often develop their foreign market operations in stages rather than making large investments in foreign markets at single points in time. This sequence of internationalization, called the *establishment chain*, consists of the following stages (Johanson & Wiedersheim-Paul, 1975, p. 307):

1. No regular export activities
2. Export via independent representatives (agents)
3. Establishment of a sales subsidiary
4. Establishment of in-country production/manufacturing

This internationalization pattern captures the different ways in which firms interact in business relationships in foreign markets. The pattern, moreover, shows that firms successively make larger and larger resource commitments to increase their own interaction in certain markets. Examples of resources that could be committed to foreign markets in the different stages could include anything from financial and knowledge resources to investments in local marketing organizations, increased interactions with specific customers, and investments in personnel. The more specialized the resources are to a specific market, the greater the degree of a firm's commitment to that market (Johanson & Vahlne, 1977).

The first stage of the establishment chain describes a situation where a firm has not made any substantial investments to increase its interactions with the other parties in its foreign business relationships. Thus, the firm has made no commitment of resources to a particular foreign market and lacks any regular information channel to and from the market. In the second stage, the firm interacts with foreign business partners via intermediaries. Hence, the firm has established a channel to a specific market through which it attains information about, for instance, sales development. In this stage, the firm has also made a commitment to a particular market. In the third stage, the firm has made investments to manage its interaction in foreign business relationships via a sales subsidiary. The firm has now made a resource commitment that provides it with a controlled information channel to the market. High-commitment internationalization modes such as foreign sales subsidiaries also facilitate a high quality and quantity of interaction in foreign business relationships because sellers are located within the local markets where the customers reside. The fourth stage involves a still larger investment in managing the interaction in foreign business relationships, which increases

the resource commitment to the foreign market (Johanson & Wiedersheim-Paul, 1975).

Another observation made when discussing the establishment chain was the idea that there exists a psychic distance between markets (Forsgren & Kinch, 1970; Hörnell, Vahlne, & Wiedersheim-Paul, 1973) and that the sequence of internationalization seems to be related to the psychic distance between the home market and the foreign countries (Johanson & Wiedersheim-Paul, 1975). The concept of psychic distance is defined as “factors preventing or disturbing the flows of information between firm and market” (Johanson & Wiedersheim-Paul, 1975, p. 308). These factors can, for example, be differences in language, education systems, business approaches, political systems, or culture (Hörnell et al., 1973). Lack of interaction in foreign markets leads to a lack of knowledge about psychic distance factors in foreign markets, and this also influences the actions that firms choose to take. It is easier for firms to interact within its business relationships and establish themselves in countries that have a low psychic distance to their home market, such as neighboring countries or countries that are comparatively well known and similar with regard to business practices.

The Uppsala Theory

The idea that increased knowledge about foreign markets is important for firms’ internationalization influenced some of the Uppsala researchers to search for knowledge theories that could explain how firms used knowledge to aid their international advancement. In a noted article from 1977, Johanson and Vahlne used two theoretical frameworks about knowledge as building blocks to develop a knowledge-based internationalization process theory. The first building block was Penrose’s (1959) idea that a firm’s growth is a result of the firm’s ability to utilize, combine, and develop resources, where knowledge is one of the most important resources that a firm can acquire. Penrose also presented the idea that a specific kind of knowledge—namely, knowledge gained from experience—is an important determinant of a firm’s growth and exploitation of entrepreneurial opportunities. This knowledge is dependent on previous activities, which implies that knowledge acquired by doing cannot be transferred to others. In contrast to knowledge based on experience, Penrose also identified objective knowledge as a type of knowledge that can be taught and learned from other persons and, thus, can be formally expressed and transmitted (for example, through a written text).

Johanson and Vahlne’s (1977) second building block was the behavioral theory of the firm. This theory emphasizes that a firm’s decision-making process is distinguished by bounded rationality because its management cannot obtain complete information about markets and, therefore, the firm’s actions are constrained by a limited ability to process information (Cyert & March, 1963). The idea behind this theory is that managers cannot have more than a limited knowledge about things such as market conditions. A firm is therefore highly influenced by its limited knowledge, and many of its

actions revolve around the search for and development of knowledge to avoid uncertainty. The lack of information processing within a firm thus influences it to perform incremental adjustments to change conditions within the firm and the environment (Aharoni, 1966).

Johanson and Vahlne (1977) followed the reasoning of Penrose (1959) and Cyert and March (1963), as well as their own empirical observations, to support the idea that knowledge is a limited resource that is critical for the internationalization process of firms. They also complied with Penrose's idea that markets must be regarded as heterogeneous, rather than homogeneous, entities. In their paper, they distinguish between knowledge that is acquired from a firm's own experience interacting with foreign markets in its operations abroad (i.e., experiential knowledge) and the knowledge that can be acquired from standardized methods like market research (i.e., objective knowledge). The people who work with foreign operations will acquire experiences with a specific market through their interaction in business relationships and daily activities in that market. Because experiential knowledge must be acquired via personal experience, the authors describe this kind of knowledge as more difficult to acquire than objective knowledge.

The concepts of psychic distance and the establishment chain both build on the notion that the effort to avoid uncertainties is a strong influential factor for firms' internationalization. When a firm chooses to establish itself in a market from which it has a short psychic distance (e.g., a market that shares a similar language, education system, way of conducting business, political system, culture), the risk of being deceived in foreign business relationships is lessened. The same can be said for firms that follow the incremental establishment chain in their internationalization because this reduces the risk of making too large a resource commitment to new foreign markets from the start. Building on the empirical observations leading up to the ideas about psychic distance and the establishment chain, Johanson and Vahlne (1977) showed that there exists a pattern of incremental increases in firms' interactions in foreign business relationships and resource commitments made to specific foreign markets. The authors, moreover, identified increased experiential knowledge as a factor that lessens the uncertainty firms may feel when increasing their interactions in foreign business relationships and resource commitments to foreign markets. When a firm first enters a new foreign market, it initially lacks knowledge about how to conduct business there. This knowledge is, however, gradually built up by interacting in business relationships and performing operations in the market, and uncertainty is thus reduced. The greater the experiential knowledge that a firm has about a foreign market, the more that uncertainty can be reduced and the stronger the commitment of resources to this market (Johanson & Vahlne, 1977).

Support of the Uppsala Theory

A vast number of researchers have over the years offered support to the Uppsala behavioral internationalization process theory's core idea—that interaction in foreign business relationships as a means of developing experiential knowledge is critical for the internationalizing firm (Eriksson et al., 1997, 2000; Erramilli, 1991; Lindstrand, 2003a; Sharma & Blomstermo, 2003). Experiential knowledge was split into foreign business knowledge, foreign institutional knowledge, and internationalization knowledge by Eriksson, Johanson, Majkgård, and Sharma (1997). The results of their study showed that experiential knowledge is an important resource that internationalizing firms collect through interactions in business relationships abroad and that they use to learn about foreign clients and markets, local laws, local governments, and local cultures. Experiential knowledge also enables firms to learn about their own internal resources and capabilities for engaging in international operations.

Another study that offers particular support for the Uppsala theory's underlying assumption that the internationalization process is sequential is Erramilli's (1991) investigation of the internationalization processes of service firms. Erramilli's study showed that the factor of experience plays an important role in the foreign market entry behavior of service firms. Service firms with less experience prefer to enter foreign markets that are similar to those of their home countries. As their experience increases and becomes more diversified, the firms increasingly interact with markets that are more distant. A LISREL analysis study on quantitative data by Eriksson, Johanson, Majkgård, and Sharma (2000) offered support to Erramilli's (1991) study. The authors' analysis showed that variation (i.e., the diversity of foreign environments to which an internationalizing firm is exposed) has a positive effect on the accumulation of experiential knowledge in internationalizing firms.

Sharma and Blomstermo (2003), moreover, perform a study where time is defined as the time spent in foreign operations and is referred to as *duration*. Sharma and Blomstermo pointed out that duration has been traditionally viewed as a predictor of knowledge accumulation in internationalizing firms. A basic assumption is that there exists a direct positive correlation between duration and development of experiential knowledge. The more that firms interact with counterparts in foreign markets and the longer that they operate abroad, the more that they learn and the more rational their decision-making process becomes. Sharma and Blomstermo (2003) argued that current theories about time and its relationship to knowledge in internationalization are overly simplistic. The relationship between duration and the development of experiential knowledge is more likely to be nonlinear and discontinuous.

The articles by Eriksson, Johanson, Majkgård, and Sharma (2000) and Sharma and Blomstermo (2003) emphasized that both duration and variation of foreign market operations constitute the foundation on which a firm's experiential knowledge is built. The foreign market operations are,

however, also a result of the firm's previously acquired experiential knowledge. The things a firm has learned from prior interactions with foreign counterparts and prior experiences are important lessons for the firm's further international expansion (Blomstermo et al., 2004). Thus, knowledge accumulated in the past guides a firm in its future internationalization, and if a firm is faced with a decision-making situation in an international market, the firm applies those solutions that have proven successful in the past (Blomstermo & Sharma, 2003). In this way, experiential knowledge enables an internationalizing firm to search, analyze, and take action in international markets. Internationalizing firms can, for example, utilize experiential knowledge to identify and solve problems, to develop alternative courses of action, to evaluate alternatives, and to select from among those alternatives. Experiential knowledge can also provide the answers to questions concerning how to approach and best interact with a foreign customer in a specific country, how to find important customers, and how to handle problems with foreign regulations and norms. Experiential knowledge may also help an internationalizing firm to identify mistakes that have been made and take actions to correct these mistakes (Blomstermo et al., 2004).

The argument that national cultural distance³ is significant for the choice of internationalization modes has been empirically proven in an investigation of foreign firms entering the United States (Kogut & Singh, 1988). This study represented one of the first statistical tests of the relationship between culture and entry choice, and the results showed that when economic choice is compared across countries, cultural characteristics are likely to have profound implications.

Innovation-related Internationalization Theories

Other behavioral and process-oriented internationalization theories that emerged at roughly the same time as the Uppsala theory were the innovation-related internationalization theories of the late 1970s and early 1980s (e.g., Bilkey & Tesar, 1977; Reid, 1981). These theories and models regard the development of export activities as either innovation-adoption cycles or export development learning curves.

The similarities between the Uppsala theory and the innovation theories are that they both propose an incremental stages approach to export development and generally support the notion of psychic distance. Both schools, furthermore, attribute the gradual pattern of export development to two things: the firm's lack of knowledge (especially experiential knowledge) and the uncertainty associated with the decision to internationalize (Ghanatabadi, 2005).

One difference between the behavioral internationalization process theories described by the two schools of research is that the Uppsala theory is

³ Kogut and Singh (1988) estimated national cultural distance as a composite index based on the deviation from Hofstede's (1980) national culture scales: power distance, uncertainty avoidance, masculinity/femininity, and individualism.

less bound to time and space concerns and, therefore, can be said to be more general. The Uppsala theory, furthermore, offers a more in-depth discussion about the dynamics of knowledge and learning than the other theories (Andersen, 1993). Perhaps as a consequence of these differences, the innovation theories have not been as commonly used in research on international business and international marketing.

Criticism of the Uppsala Theory

Although many studies have supported the results presented in the Uppsala theory, the theory and model presented by Johanson and Vahlne in their 1977 paper have also been subjected to a great deal of criticism over the years. The most frequent objections concern the fact that the knowledge model presented by the authors does not properly address how and why internationalization starts or how to predict movement from one internationalization stage to the next (Andersen, 1993). Other frequent objections concern the relevance of the psychic distance concept (Lindbergh, 2005; Millington & Bayliss, 1990). The theory has also been criticized for predicting too direct of a relationship between experiential knowledge development and increased internationalization (Forsgren, 2002). The theory also does not sufficiently discuss the problems that can emerge when internationalizing firms become too closely connected to a certain market, making it difficult to use the resources of the firm for other purposes (Hadjikhani, 1997).

Johanson and Vahlne's (1977) theory has also been criticized for not making any distinction between the foreign entry processes in small and large firms. This differentiation has been considered vital because foreign entry behavior is likely to be more structurally determined in a large firm than in a small firm (Reid, 1981). This criticism has, furthermore, been followed up by a multitude of researchers who are particularly interested in the internationalization of smaller firms. Many of these studies have shown that incremental internationalization models fail to explain the internationalization of SMEs (Crick & Jones, 2000; Lituchy & Rail, 2000), the export behaviors of newly established firms (Moen, 2002), and the international progress of born global firms (Andersson & Wictor, 2003; Madsen & Servais, 1997; Saarenketo, Puumalainen, Kuivalainen, & Kyläheiko, 2004).

Even though the Uppsala theory has been subjected to criticism by numerous researchers, there are no studies that prove that the theory has no bearing on the explanation of firms' internationalization process. The criticism against behavioral internationalization process theory has, however, led to a continuous cultivation by a multitude of researchers, including Johanson and Vahlne themselves (e.g., Johanson and Vahlne, 1990, 2003, 2009). In their 1990 paper, Johanson and Vahlne attempted to extend the explanatory power of the theory by expanding its theoretical base to embrace new concepts and approaches. The largest difference is, however, that internationalization process theory is discussed with regard to business relationships within

business networks. This development of the Uppsala theory will be further discussed in the next section of the dissertation.

In contrast to the economic approaches of studying the internationalization of firms, the Uppsala theory and the subsequent studies building on this theory emphasize that interaction in foreign business relationships is the foundation of experiential knowledge development. The experiential knowledge that is developed when interacting in these foreign markets will, moreover, influence firms' internationalization in a positive manner. The theory also shows that low-commitment internationalization modes lead to small resource commitments to foreign markets, whereas high-commitment internationalization modes lead to large resource commitments. This indicates that the use of different interaction means in the form of low and high-commitment internationalization modes will influence the development of experiential knowledge development and firm internationalization in different ways. A theoretical framework building on the Uppsala theory is, therefore, a useful tool in investigating how different interaction means relate to the experiential knowledge development and internationalization of SMEs.

Interaction in Networks

Because the development of business relationships is an expensive process that takes time and effort, interacting firms are often committed to each other through mutual dependencies (Forsgren & Kinch, 1970; Håkansson, 1982; Mattsson & Björkroth, 1978). Much of the research about the mutual dependencies between firms initially focused on dyadic business relationships between two firms (Turnbull et al., 1996). These dyads evolve from the interaction between two parties doing business with each other (Håkansson, 1982; Johanson & Mattsson, 1987). Different business relationships are, however, also connected to each other, and interaction in one business relationship influences what happens in another. As a consequence, business relationships can be investigated in the context of business networks.

Business Networks

The network approach focuses on the multiple interlinked business relationships that reside within a business network (Johanson & Mattsson, 1987). Business relationships between firms can be considered to be connected if the exchange in one relationship is contingent on the exchange (or non-exchange) in another (Cook & Emerson, 1978). From this perspective, markets are considered to be built on networks and can thus be viewed as systems of interactive relationships between firms (Mattsson & Johanson, 2006). Firms thus exist within a complex network of interactions where exchanges are made in the form of information, expertise, goods and services, and payments and loans. Every interaction is unique and, at the same time, is influenced by the whole network of interactions (Ford et al., 1986).

Networks and Knowledge Development

Within the business literature, business networks have been identified as environments distinguished by reciprocity and the interdependencies of relationships. Firms may, for example, use their business networks to develop business relationships that secure access to important resources and the sale of products or services (Achrol & Kotler, 1999; Johanson & Mattsson, 1987, 1988).

Much of the knowledge utilized in a firm is, moreover, received from relationships with other firms in the network (Burt, 1997; Sharma & Blomstermo, 2003). Business networks can thus be seen as entities in which firms interact to develop knowledge (Lindstrand, 2003c). Furthermore, the experience that a firm acquires by interacting in networks with other firms develops its ability to interact with others and increases its access to knowledge resources both within and outside the firm. This knowledge development process can produce substantial effects on the growth and innovative activities of firms (Lorenzoni & Lipparini, 1999). In their study of the biotechnology industry, Powell, Koput, and Smith-Doerr (1996) found that a business network may even serve as a locus of innovation activities because it provides access to knowledge and resources that otherwise would be unavailable for individual firms. Networks can, thus, be more effective than individual firms at the generation, transfer, and recombination of knowledge; one reason for this superiority is the greater diversity of knowledge within a network compared with a firm. The creation and sharing of knowledge in networks have even been proven effective at providing relative productivity advantages for all participating parties in a business network. Previous studies have shown that network actors can increase their pace of learning after participating in knowledge-sharing networks (Dyer & Nobeoka, 2000).

Actors in networks are connected to each other by either strong or weak relationships (Granovetter, 1973; Nummela, 2004). When firms restrict their networks to interactions with similar counterparts (i.e., groups with which they have strong relationships), their access to information from a wider range of groups is reduced. As a consequence, information will be redundant and may stifle innovation activities (Granovetter, 1973) because the equivalent networks will share the same information sources. Non-redundant network relationships offer instrumental information that is additive rather than redundant. In his analysis of what he calls *structural holes*, Burt (1997) explained how disconnections between counterparts in markets leave people unaware of the benefits (e.g., in the form of lower prices) that they could offer one another. Structural holes, however, provide opportunities to broker the flow of information between people and to control projects that bring people together from opposite sides of the hole. Burt (1982) also described the range of a network as the degree of diversity contained in the network. Thus, a broad range of network relationships provides greater access to, for instance, important knowledge resources than would be possible if contacts were drawn from a narrower group.

Even though firms can benefit from interacting with counterparts with which they have weak relationships, trust is, as previously mentioned, an important element in business interaction (Laage-Hellman, 1997). Uzzi (1997) even argued that trust acts as the primary governance structure in networks of exchange. In accordance with Uzzi, several authors have emphasized the importance of trust in the acquisition of knowledge in network relationships (Buckman, 1998; Yli-Renko et al., 2002).

Networks and Internationalization

In their article about the behavioral internationalization process of firms, Johanson and Vahlne (1977) did not give network relationships any explicit attention. In subsequent articles, however, these authors emphasized the importance of networks in the experiential knowledge development and internationalization of firms (Johanson & Vahlne, 1990, 2009). They argued that business networks are particularly important for knowledge development in internationalizing firms because knowledge is accrued not only from the activities of the firms but also from the activities of their business counterparts and their network relationships (Johanson & Vahlne, 2009). Proponents of the Uppsala theory should, therefore, focus on the interactions in business relationships and the patterns of international establishment that network relationships can cause (Johanson & Vahlne, 2003). Internationalizing firms, in particular, can make use of their networks to acquire knowledge about foreign business opportunities (Agndal & Chetty, 2007, Johanson & Vahlne, 2009; Sharma & Johanson, 1987). Previous research has even found a link between international business network development in general and increased performance (Blankenburg Holm, Eriksson & Johanson, 1999).

In an international business network, network relationships typically consist of customers, suppliers, distributors, or even competitors (Blomstermo et al., 2004; Lindstrand, 2003a). It is not necessarily the most obvious strong business relationships, such as customers, that are the most important in a firm's business network. In their study about the client-following and market-seeking behaviors of service firms, Majkgård and Sharma (1998) showed that the need for interaction with suppliers often influences entry into certain foreign markets. Other studies have also shown that interactions with weaker and more remote business relationships (e.g., sub-suppliers, consultants, and banks) may serve as important sources of experiential knowledge development and even as bridges to new markets (Lindstrand, 2003b; Sharma & Johanson, 1987). One example of this is a study by Lindstrand, Eriksson, and Sharma (2009), which showed that client networks (consisting of actors such as clients' clients, clients' supplementary suppliers, and competitors) should be seen as vital resources that can provide firms with important competitive advantages. Figure 1 illustrates a business network, in which an internationalizing firm interacts with its surrounding business partners via different kinds of exchanges and adaptations.

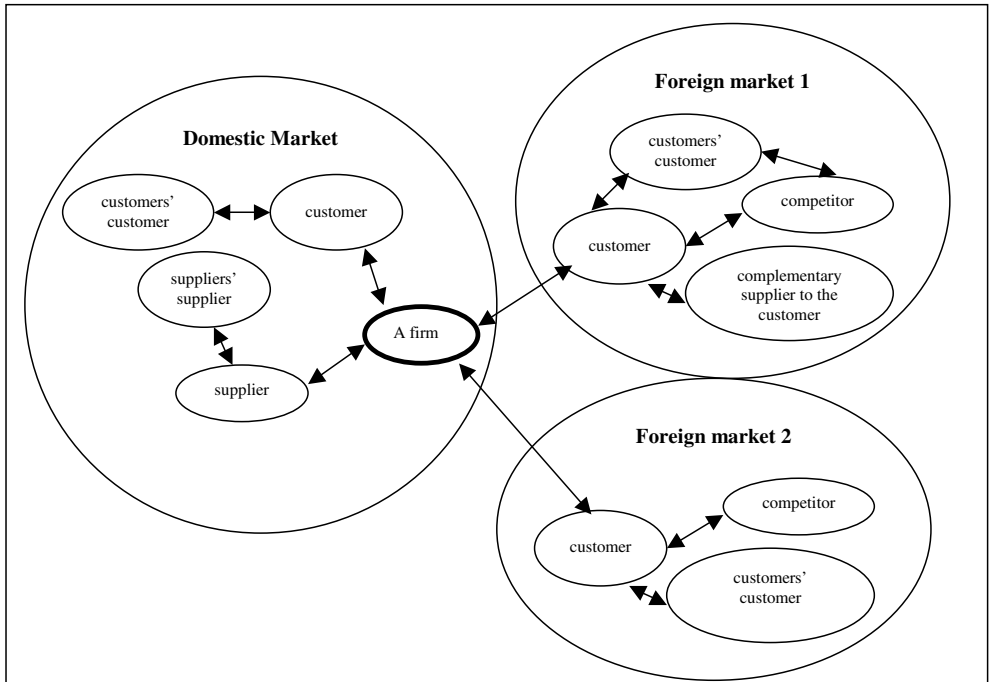


Figure 1 An International Business Network.

Personal Networks

Like Johanson and Vahlne (1990, 2003, 2009), other researchers within the area of international business have indicated that network theory should be integrated with behavioral internationalization process theory, especially when investigating the phenomenon of internationalizing SMEs (Blomstermo & Sharma, 2003; Chetty & Blankenburg Holm, 2000; Coviello & Munro, 1997; Crick & Jones, 2000; Moen et al., 2004). The business network approach assumes that companies are engaged in a set of interactions in business relationships, such as customers and suppliers, but SMEs, which have recently been established and may lack existing sets of business relationships, may need to use other kinds of interactions to reach foreign markets. Instead of using business relationships, these firms often use personal relationships, for example, friends, family members, and former colleagues. In fact, these personal network relationships may be just as important as business network relationships for providing access to resources and furthering the firms' internationalization (Coviello & Munro, 1995; Crick & Jones, 2000). Studies about the internationalization of smaller and newly started firms have, therefore, focused on the importance of personal relationships (Ellis, 2000; Melén, 2009). Another study that focused on the importance of informal ties between individuals was Brown and Duguid's (1998) study about the biotechnology industry. The results of this study showed that the

biotechnology industry is an example of an industry where informal links are common. Researchers within the biotechnology industry are significantly linked through personal connections. The practitioners have a great deal in common, such as their institutional backgrounds, their interests, and the means with which they evaluate what is and is not important. The interactions and relationships within the biotechnology field also help knowledge to spread.

Small companies' interactions in personal relationships provide them with important knowledge about foreign market opportunities (Ellis, 2000) and information about, for example, market trends and technological development (Yli-Renko, Autio & Sapienza, 2001; Yli-Renko et al., 2002). Some previous studies have particularly emphasized the importance for small and newly started firms to interact with the personal networks of founders and managers in their initial internationalization so as to find important business opportunities (Crick & Spence, 2005; McDougall et al., 1994; Moen et al., 2004). This is particularly common for born global firms, which will be discussed in more detail in the next section of the dissertation.

Both theories that emphasize the importance of business networks and those that highlight the importance of personal networks show that interaction in foreign business relationships within networks influences firms' experiential knowledge development and internationalization in a positive manner. There are, however, different views on whether it is the business network interactions or the personal network interactions that provide the best means of access to foreign markets. To analyze how interaction relates to the experiential knowledge development and internationalization of SMEs, it is necessary to include perspectives from theoretical work about both business and personal networks.

Interaction and the Rapid Internationalization of SMEs

Given the increasing importance of internationalizing SMEs for the welfare of many Western economies, academic interest in these types of firms has increased in recent decades. Before the 1990s, contemplations about the internationalization of SMEs often concluded with discussions about how size limitations and newness often hampered these firms' internationalization (Coviello & McAuley, 1999). During the 1990s, however, more and more researchers started to report that certain SMEs became international rapidly despite the obstacles in their way (e.g., size and resource limitations) (Knight & Cavusgil, 1996; Madsen & Servais, 1997; McDougall et al., 1994). The studies about these so-called born global firms typically belong to the research field of international entrepreneurship. This field combines ideas from international business research, which has often focused on established multinational companies, and entrepreneurship research, which has primarily focused on venture creation and the management of SMEs within the domestic context. A current working definition of international entrepreneurship states that "international entrepreneurship is the discovery, enactment, evaluation,

and exploitation of opportunities—across national borders—to create future goods and services” (Oviatt & McDougall, 2005, p. 7).

International entrepreneurship research has long focused on the existence of born global firms, which, in comparison with large, established multinational corporations, are generally new firms that lack organizational histories. For this reason, these firms do not possess the deeply rooted routines, practices, and structures that often characterize long-established businesses. Instead, the knowledge found in a born global firm is stored within the staff (Autio, 2005). During their previous jobs and life experiences, the founders and managers of born globals accumulated important international knowledge that enables them to expand their firm’s businesses to foreign markets more rapidly than otherwise would have been possible. In addition, the staff members of born global firms often possess technological knowledge, which enables them to develop unique products and services (Autio et al., 2000; Oviatt & McDougall, 1994). Unique experiences with certain technologies are, in many firms, a crucial source of knowledge that gives the employees the ability to understand the problems of the firm’s customers as well as the capability to solve them.

Born global firms operate in dynamic markets, in which windows of opportunity rapidly open and close. As a consequence, these firms must sense and act upon opportunities abroad quickly, efficiently, and holistically (Crick & Spence, 2005; Dimitratos & Jones, 2005). Hence, the discovery and exploitation of foreign market opportunities are essential to the internationalization of born global firms. On the basis of the research of Shane and Venkataraman (2000), foreign market opportunities are regarded as the situations in which new goods, services, raw materials, and organizing methods can be introduced in a specific foreign market. Therefore, foreign market opportunity exploitation can be regarded as the commitment of resources to a specific foreign market. Foreign market opportunities are often developed as a consequence of the privileged knowledge that business partners create when interacting with each other (Johanson & Vahlne, 2009). Hence, the opportunities that are discovered within these ongoing foreign market activities are a consequence of chance, rather than planning, and are, therefore, not something that cannot be controlled.

One means for a born global to manage a more rapid internationalization process is to interact in its network relationships so as to access the needed resources (Coviello & Munro, 1997; Yli-Renko et al., 2002). Scholars have even described the internationalization process of these firms to be a matter of learning through networks (Saarenketo et al., 2004; Sharma & Blomstermo, 2003). The development of experiential knowledge about foreign markets is also considered critical for the internationalization processes of born globals (Autio et al., 2000; Sharma & Blomstermo, 2003). Experiential knowledge about foreign customers is considered to be particularly important for these firms (Knight, Madsen, & Servais, 2004; Rialp et al., 2005). In contrast to the internationalization of firms as described in the Uppsala theory, born globals have not been shown to follow an incremental internationalization

process. In a study from 2004, Saarenketo, Puumalainen, Kuivalainen, and Kyläheiko found that the internationalization process of small high-technology firms often differs from that of more mature industries. These firms aim at international markets from their first day of existence. In their effort to achieve these results, they interact with partners and networks early, which enable them to learn about and reach foreign markets sooner. In addition, Andersson and Wictor (2003) suggested that the internationalization processes of born globals are more rapid than is suggested in the Uppsala theory. The authors argued that instead of developing in a stepwise manner, going from one level of foreign market commitment to the next, the international establishment of born globals depends on strategic choices.

Yet one explanation for the conflicting findings regarding the internationalization processes of born globals can be found in an article by Autio, Sapienza, and Almeida (2000). These authors argued that knowledge and learning are important determinants of growth for all firms, but as firms grow older, they develop learning impediments that hamper their ability to grow in new environments. The relative flexibility of newer firms, however, allows these firms to learn about the competences necessary to pursue rapid continued growth in foreign markets. The idea that all firms go international by taking small steps makes sense because this manner of internationalization allows firms to learn from their mistakes, rather than be destroyed by them. The authors thought it unlikely that young firms are capable of taking larger, bolder steps than older firms. Small firms are, however, capable of taking small incremental steps more rapidly than older firms. The survival and the prosperity of born global firms may be explained by their ability to adapt and innovate more rapidly in new and dynamic environments than would ordinarily be the case for older firms. The results of Autio, Sapienza, and Almeida (2000) suggested a revision of behavioral internationalization process theories that more explicitly takes into consideration the dynamic and history-dependent nature of the internationalization processes of firms.

In accordance with Autio, Sapienza, and Almeida (2000), other studies have shown that there is not one specific pattern in the use of internationalization modes among born globals (Sharma & Blomstermo, 2003). Instead, born globals are flexible in their use of internationalization modes (Rialp et al., 2005). There is thus no predetermined blueprint for born globals to follow; instead, their internationalization is built on improvisation and trial and error (Sharma & Blomstermo, 2003).

Because the purpose of this dissertation is to investigate how interaction relates to the experiential knowledge development and internationalization of SMEs, international entrepreneurship research is needed. Previous research about born globals has even shown that these firms depart from the patterns of interaction, experiential knowledge development, and internationalization that are described in the Uppsala theory. Hence, the arguments made in this research field provide a particularly interesting starting point when investigating the relevance of the Uppsala theory for the interaction, experiential knowledge development, and internationalization of

SMEs. Instead of following a stepwise internationalization moving from low-commitment to high-commitment internationalization modes, born globals have been shown to use multiple interaction means towards foreign business partners by using different internationalization modes simultaneously (Andersson & Wictor, 2003; Crick & Jones, 2000).

A starting point for this dissertation is the Uppsala theory principle that experiential knowledge development about foreign markets is vital for the survival of internationalizing firms (Coviello & Munro, 1997; Yli-Renko et al., 2002). Even though this view is combined with theoretical implications from more recent studies about internationalizing SMEs and born globals, the idea that experiential learning about foreign markets is vital for internationalization is not contended. Thus, the next part of the dissertation will discuss the implications of experiential knowledge development for the internationalization of SMEs in more detail.

Interaction and Experiential Knowledge

John Locke (1632–1704) argued that knowledge about the world is created by people themselves and their cognitions, as a result of experiences (Magee, 1999). The old idea that knowledge is built on experience is also a recurring argument in the social sciences literature. Michael Polanyi (1966) delineated the concept of knowledge into the dimensions of tacit and explicit knowledge. Explicit, or codified, knowledge refers to knowledge that is transmittable in a formal way (i.e., in a lecture). By contrast, tacit knowledge has a personal quality that makes it hard to formalize and communicate. Polanyi's reason for dividing the concept of knowledge into two terms was his argument that people can always know more than they can tell. Knowledge that can be expressed in words and numbers only represents the tip of the iceberg of the entire body of possible knowledge (Polanyi, 1966). Building on the research of Polanyi, Nonaka (1994) argued that in contrast to explicit knowledge, tacit knowledge consists partly of technical skills—the kind of informal, hard-to-pin-down skills captured in the term *know-how*—and, therefore, has an important cognitive dimension. Tacit knowledge is abstract and consists of mental models, beliefs, and perspectives so ingrained in people that they take it for granted and cannot easily articulate it. Explicit knowledge, on the other hand, is knowledge that is documented and public. This kind of knowledge can also be captured and shared through the use of ICTs (Nonaka, 1994).

Similarly to Polanyi and Nonaka, many scholars have developed the knowledge concept to incorporate different attributes (e.g., Argyris & Schön, 1978; Kogut & Zander, 1992; March, 1991). Kogut & Zander (1992) differentiated between information (e.g., facts) and know-how (e.g., how to cooperate). Knowledge as information implies knowing what something means, whereas know-how implies knowing how to do something.

The idea that knowledge is based on experience is, as has already been discussed, also an important cornerstone of the Uppsala theory. It partly builds on the assumption that the world is a complicated and ambiguous place

and that no one can know much about it (Cyert & March, 1963). This limits firms' abilities to acquire important experiential knowledge about markets. Because experiential knowledge is seen as both more important and more complicated to acquire than objective knowledge (Penrose, 1959; Johanson & Vahlne, 1977), it is regarded as a particularly important intangible resource for an internationalizing firm. This argument is also supported by the resource-based view of the firm, which assumes that intangible resources like experiential knowledge (which are valuable, rare, inimitable, and non-substitutable) should be identified as particularly important for strengthening the competitive positions of firms (Barney, 1991). Differences in performances between firms may, in fact, be traced to differences in resource endowments and capabilities (Foss, 1997). Building on the Uppsala internationalization process theory and the resource-based view of the firm, experiential knowledge can be considered a particularly valuable resource for an internationalizing firm because of its inimitable and non-substitutable nature. In contrast to experiential/tacit knowledge, objective/explicit knowledge can be codified and is, thus, relatively easy to transfer. One difference between tacit and experiential knowledge is that the development and use of tacit knowledge is said to require skill and practice, whereas the development of experiential knowledge requires only experience (and the ability to make use of this experience).

In summary, it can be said that experience, learning-by-doing, and know-how are similar concepts that describe knowledge processes involving learning through immersion in the world. I have chosen to use the concept of experiential knowledge to describe this knowledge process. Experiential knowledge is not something that can be easily acquired because it is based on experience that is gained while interacting in business relationships in foreign markets and is hard to articulate and communicate. The experiential knowledge concept is also a concept that presupposes that employees within an organization have performed previous activities because an organization cannot develop experiential knowledge by itself. Although it was originally conceived at the individual level, Kogut and Zander (1992) regard a tacit kind of knowledge to be embedded in the organizing principles by which people cooperate within organizations. Teece (1998) developed this thought further when he argued that even though knowledge assets are grounded in the experience and expertise of individuals, firms provide the physical, social, and resource allocation structure that allows knowledge to be shaped into competences. Hence, knowledge found in an individual can be manifested in routines, standard operating procedures and scripts (Huber, 1991) and can, therefore, be stored in an organization's procedures, norms, rules, and forms (March, 1991). On the basis of these arguments, experiential knowledge development is seen as a learning process that involves a whole firm and not something that exclusively happens on an individual level. Hence, this dissertation focuses on the firm as the unit of analysis to investigate internationalizing SMEs.

Personal Interaction

The development of experiential knowledge also has implications for the interaction of firms as previous studies have shown that rich modality interaction or *personal interaction* (i.e., face-to-face communication and telephone communication) facilitates an efficient transfer of tacit knowledge (Hansen, Nohira, & Tierny, 1999; Koskinen & Vanharanta, 2002; Romijn & Albu, 2002; Tödtling & Kaufmann, 2001). One reason for this finding could be that personal interaction provides the parties in a business relationship with multiple sources of information, including body language (in face-to-face encounters) and tone of voice (in both face-to-face and telephone encounters). Furthermore, both of these types of interaction have a personal focus and enable the use of natural language (Daft & Lengel, 1986). They also allow for real-time feedback, inflection, timing of response, and (in the case of meetings and telephone conferences) multiple participants⁴ (Murray & Peyrefitte, 2007).

A person can acquire tacit knowledge without language by using the senses to observe, listen, imitate, and practice. Exchange mechanisms such as meetings and telephone conversations, containing distinctive traits regarding verbal and non-verbal cues, are therefore particularly important for the development of tacit knowledge. For this reason, rich modality interaction can be said to have an edge over some ICT tools (like e-mail and intranet) when it comes to interacting with customers for purposes like technology development and new product development.

As mentioned earlier, the Uppsala theory has been criticized for not taking under consideration the differences between small and large firms. Lituchy and Rail (2000) argued that incremental behavioral internationalization process theory cannot explain the internationalization processes of SMEs because the improved ICT systems that are in place today allow firms to enter distant foreign markets from the outset.

In accordance with Lituchy and Rail (2000), other researchers have also supported the view that the emergence of information technology (IT) has revolutionized the prerequisites for SME internationalization (Coviello & Munro, 1997; Feindt, Jeffcoate, & Chappell, 2002). Hill (2001) argued that the Web has emerged as a great equalizer that allows both small and large businesses to expand their global presence at a lower cost than ever before. Fernández Jurado and Bilbao Calabuig (2001) argued that SMEs with clear strategic ideas and few resources for investment can use ICTs to obtain excellent results. ICTs can be used to gather information about markets and competitors and to cut a company's communication costs. The use of ICTs can also help an SME sell products all around the world and, thus, become a mini-multinational company.

⁴ Even though ICT tools like video and Web conferences also allow for the use of natural language, real-time feedback, inflection, timing of response, and multiple participants, previous studies have revealed that SMEs often have not adopted these kinds of ICT tools because of a lack of resources, awareness, and/or skills for ICT adoption (OECD, 2002). The organizational changes that often follow ICT investments are, moreover, perceived by firms as costly (Basu & Fernald, 2008) and may, therefore, often be waived.

On the basis of these previous studies, it is evident that the internationalization of SMEs has benefited from the IT revolution. However, studies have also suggested that rich modality interaction is still highly relevant for the successful internationalization of SMEs. In a study about network organizations, Nohira and Eccles (1992) argue that personal meetings are essential for forming the mental images of others. Strong feelings of like or dislike, trust or distrust, attraction or repulsion, and so forth are often formed in the first face-to-face interaction. Personal interaction, therefore, plays an essential role in establishing and maintaining the kind of robust relationships necessary for effective interaction and cooperation. Personal interaction is particularly necessary in business situations where feelings of uncertainty, ambiguity, and risk are involved. In particular, there is a connection between rich media and the evocation of trust in business relationships. In support of this argument, O'Hara-Devereaux and Johansen (1994) argued that face-to-face meetings are virtually irreplaceable for building interpersonal bonds between different firms. Voice mail and video conferencing can provide ongoing support for maintaining trust because they convey some of the emotional context and interaction that are impossible in text-only technologies like e-mail. Even so, face-to-face meetings are usually essential to establish trust in the first place.

Once trust has been established in a business relationship, it plays a central role in helping the different parties to overcome uncertainties (McKnight, Choudhury, & Kacmar, 2002). In a business relationship, lack of information about the motivations of others may be the ground on which uncertainty is built (Kollock, 1994), and even unflattering knowledge about a business counterpart can, therefore, be better than no knowledge at all (Shepherd & Zacharakis, 2003). For this reason, experiential knowledge about business counterparts is an important way to reduce uncertainty and induce trust. Because personal interaction provides the parties in a business relationship with multiple sources of information, experiential knowledge can best be acquired through the use of personal interaction. Moreover, interaction between firms when developing new technology and new products is ultimately grounded in the successful transfer of complex, non-codifiable messages that require closeness between the sender and the receiver (Piscitello & Sgobbi, 2003). Different means of interaction can thus substantially affect behaviors and outcomes in business relationships. For instance, electronic communications may be less helpful than more personal forms of interactions in situations where cooperation is open-ended (Frohlich & Oppenheimer, 1998), which often may be the case in situations of technology and new product development.

Taking the above-mentioned studies under consideration, a high quality and quantity of interaction may be necessary for new knowledge to be developed, especially in the case of SMEs that are involved in activities like new product or new technology development. This type of interaction is invaluable for brainstorming and for sorting out specific bottlenecks that firms

experience in the course of pursuing new knowledge development (Romijn & Albu, 2002).

Studies about experiential knowledge have shown that this kind of knowledge is particularly important for the successful internationalization of firms. Media richness theory has moreover indicated that a high quality and quantity of interaction, which personal interaction entails, is particularly important for the development of experiential knowledge. Personal interaction is also essential for trust to develop in business relationships. To fulfill the purpose of investigating how interaction relates to the experiential knowledge development and internationalization of SMEs and to answer the research question of how the quality and quantity of interaction between SMEs and their foreign business relationships relate to their experiential knowledge development and internationalization, it was necessary to include theories building on the importance of experiential knowledge and media richness in the theoretical framework.

Theoretical Summary

The theoretical framework of this dissertation has aimed to convey several main points. Experiential knowledge development about foreign markets is one of the most important resources that a firm needs to further its internationalization. This kind of knowledge can, moreover, only be developed through interaction in foreign business relationships. An important way for internationalizing SMEs to develop experiential knowledge about foreign markets is via the business and personal network relationships of the employees.

Previously established business network and personal network relationships, as well as high and low-commitment internationalization modes, are seen as interaction means that are used to influence business relationships in foreign markets. The use of different kinds of networks and internationalization modes will influence the experiential knowledge development and internationalization of SMEs in different ways. The use of high-commitment internationalization modes will facilitate personal interaction in foreign business relationships. Personal interaction is, in turn, the interaction means that best enables experiential knowledge development and, thus, may have the greatest influence on the internationalization of SMEs. The next chapter will discuss the methods used to collect the empirical material that has been examined in this dissertation.

Research Process and Research Design

The purpose of this dissertation is to enhance our understanding of internationalizing SMEs by investigating how interaction relates to their experiential knowledge development and internationalization. This chapter presents how the qualitative and quantitative studies upon which the dissertation is built were undertaken. The chapter also describes the methods used to analyze data.

Ontological⁵ and Epistemological⁶ Positioning

Chalmers (1999) argued that within the field of social sciences, there are two major methodological traditions: an interpretative approach (often based on qualitative data) and a positivistic approach (often based on quantitative, statistical data). Positivistic approaches regard scientific results to be based on fact. Researchers who work in accordance with this tradition often regard facts to be claims about the world that can be determined directly through a careful and unprejudiced use of the senses. They believe that science ought to be based on what we can see, hear, touch, smell, and taste rather than on personal views or speculative imagination. If these observations about the world are performed in careful and unbiased ways, the facts that are produced will be safe and objective foundations for science.

In positivistic approaches, what you can know is closely connected to what you can see. Alvesson and Sköldbberg (1994) related that the scientific discussions in the Anglo-Saxon and Nordic countries in the post-war period were dominated by followers of the positivistic approach. From the end of the 1960s, however, positivism started to be subjected to strong and increasing criticism from different scholars within the social-scientific community. The critique concerned the positivistic approach's manner of only taking what can be observed (and preferably measured) into consideration. If hidden patterns or rules that were enforced behind the scenes controlled the observed parts of reality, the truth would be overlooked when researchers utilized the positivistic approach.

Followers of interpretative research approaches have often stressed that the production of scientific knowledge will always be performed

⁵ Ontology, the study of *o'ntos* (i.e., being), concerns the character of reality and our understanding of the world (Åsberg, 2001). Ontological questions (i.e., metaphysical questions) discuss the entities that modern science presumes to exist in the world (Chalmers, 1999).

⁶ Epistemology is the study of *episteme* (i.e., knowledge) (Åsberg, 2001). Epistemological questions (i.e., questions about knowledge theory) discuss how scientific knowledge can be defended with reference to evidence and the characteristics of this evidence (Chalmers, 1999). Epistemology is the study of the ways in which we can make valid claims about the world. It is concerned with the nature and scope of knowledge, how it is produced and justified, and notions such as truth, validity, and reliability.

within a social context where the purpose of acquiring knowledge is connected to other strategies and purposes, including professional purposes, personal purposes, and the purposes of the employers (Chalmers, 1999). For this reason, it is impossible for researchers to step out of their skins and be totally unbiased when describing the world. Alvesson and Sköldbberg (1994) argued that rather than utilizing positivistic approaches, researchers ought to perform intensive studies about a smaller number of cases as a means of analyzing hidden patterns. Even though I find the critique of positivism valid, I believe that questionnaires and surveys are important tools when it comes to discovering patterns in a large number of cases if they are combined with another method of research. Statistical research carried out without the support of other sources of knowledge, however, runs the risk of being misinterpreted.

There are various ways of perceiving what reality is, different ways of asserting what we can know about the world, different approaches for validating and confirming this understanding, and, consequently, different techniques for collecting data. I believe that reality on a personal level is a subjective matter and that individuals have their own view of what reality is. Even though reality on one level is subjective, most people in society share the implicit belief that reality is what actually exists, as indicated by the signs of existence that appear in the human consciousness and are designated by human terminology. The only way of gaining knowledge about both levels of reality is through sensory input. What would we actually know if we were unable to feel, smell, taste, touch, and see? What would our reality be, and how would we understand the world?

The differences in views about how the world should be investigated have influenced positivistic researchers to use quantitative statistical data and interpretative researchers to use qualitative data. After taking into account the different arguments of both these schools of thought, I decided to combine in-depth qualitative studies of a smaller number of cases with the use of survey data in my dissertation. By using both methodologies and trying to be constantly aware of the pitfalls involved with being biased, I have conducted research that I believe reflects reality. This research strategy of using a mixture of qualitative and quantitative methods (i.e., using multiple methods in examining one phenomenon) is called triangulation. Triangulation is built on the idea that one method's weaknesses are compensated for by the other method's counterbalancing strengths (Jick, 1979).

The Qualitative Study

The first task in designing the qualitative study about the interaction, experiential knowledge development, and internationalization of SMEs was to conduct an extensive literature review about the studies previously done in these areas of research. The literature review was conducted together with my colleague Sara Melén, Ph.D., in the Department of Marketing and Strategy at the Stockholm School of Economics, with whom I also cooperated in the following qualitative study. The review provided us with information, both

about existing theories concerning interaction, experiential knowledge development, and internationalization and about the latest empirical findings made in these areas of research. The literature review was conducted in early 2003, just prior to the commencement of the qualitative study.

Building on the literature review, we realized that a longitudinal data collection approach would be suitable for our qualitative study. Agndal (2004) argued that a longitudinal approach entails the study of a phenomenon over time and that this approach is particularly suitable to capturing changes in the behavior and internationalization of firms. One difficulty in applying a longitudinal approach, however, is that it is hard for a researcher to commit the time and resources to follow lengthy processes in real time, especially internationalization processes that span a multitude of years. Hence, for practical reasons, retrospective longitudinal studies must often be employed. Because longitudinal studies are those that involve repeated observations of the same items over extended periods of time, we wanted to collect data continuously about the investigated firms over a period of several years so as to collect both real-time and retrospective longitudinal data.

A key feature of our qualitative study's research design is the use of a case-study method. A case study is a preferred method to use when "a 'how' or 'why' question is being asked about a contemporary set of events over which the investigator has little or no control" (Yin, 1994, p. 9). The case-study method is also suitable for collecting data about context-specific phenomena, with the aim of providing rich insight into human behavior (Guba & Lincoln, 1994). Furthermore, we decided to use a multiple-case approach. Our reason for wanting to investigate several case firms is that we wanted to enable a comparison of many firms to see if we could discover patterns in the ways that they interacted with counterparts in foreign markets, developed experiential knowledge, and internationalized. Cross-firm comparisons can be performed either literally (when similar responses emerge) or theoretically (when contrary results emerge for predictable reasons) (Yin, 2003). The use of multiple cases thus facilitates analytic generalization.

The Sample

During the spring of 2003, we started searching for the SMEs that were to be investigated in our study. We focused on the Swedish biotechnology industry because it is an example of a highly internationalized industry that is signified by rapid change and growth. The Swedish biotechnology industry has, in fact, had the most rapid growth of all sectors in Sweden during the past 10 years (SwedenBio, 2005), thus making itself one of the leading biotechnology industries in the world. In most cases, companies within the biotechnology field can also be considered to be truly global (Brännback, Carsrud, and Renko, 2007) and, therefore, relevant to study from an internationalization perspective.

We selected the case companies from "The Swedish Biotech Industry Guide," a database that lists and offers information about most

companies in the Swedish biotechnology field. By using this database, we chose to focus on biotechnology or life science firms from the Uppsala biotech cluster as an empirical field. Our reason for this is that the Uppsala biotech cluster is such a buoyant center of biotechnology in Sweden. In a comparatively small area, you can find about a quarter of Sweden's biotechnology field in the form of two universities (Uppsala University and the Swedish University of Agricultural Science), three large national research agencies (the National Veterinary Institute, the Medical Products Agency, and the National Food Administration), and several large pharmaceutical groups and SMEs. This concentration of institutions and firms in a single location provided us with continuous access to the collection of data material. The cluster also has the advantage of geographical closeness to many of Sweden's largest venture capital investment firms, which are located in Stockholm. In relative terms, Uppsala has, furthermore, been described as one of the most biotech-intensive cities in the world (Waxell & Malmberg, 2007).

The next step in our data collection was to find a number of suitable case firm candidates from the Uppsala biotech cluster. To be included in this study, potential case firms had to have their founders still working at their firms, had to conduct their own research and development (R&D), and had to have at least one product sold in a foreign (i.e., non-Swedish) market. These criteria were chosen so that we could find internationally active firms capable of managing the production chain themselves—from R&D to the interaction in international business relationships. The reason that we wanted the founders to still be active in the firms was that previous research had indicated that founders often influenced the internationalization of firms (Andersson & Wictor, 2003; Crick & Jones, 2000; Crick & Spence, 2005; Knight & Cavusgil, 1996; Madsen & Servais, 1997; McDougall et al., 1994; Sharma & Blomstermo, 2003).

These criteria limited the number of potential cases dramatically. We chose to contact qualified candidate case firms randomly. We started out by contacting one firm by telephone and then gradually continued to add firms in the same manner. All of the firms that we contacted agreed to participate in the study. Data collection was stopped after 14 companies had been visited. Because the interviews conducted at the last few firms provided us with narratives similar to those we had previously heard, the theoretical saturation point seemed to have been reached. New insights into the phenomenon (of biotech firms' interaction, experiential knowledge development, and internationalization) were no longer gained, and the phenomenon, therefore, had been substantially explained (Glaser & Strauss, 1967). The theoretical saturation also indicated that it was unlikely that we would draw an incremental improvement of theory if we were to continue investigating more firms (Eisenhardt, 1989).

Of the 14 firms that were included in the qualitative study, only 8 could be considered to be born globals. These 8 firms fitted into the commonly used operationalization that views born globals "as firms less than 20 years old that internationalised on average within three years of founding and generate at

least 25 percent of total sales from abroad” (Knight et al., 2004, p. 649). Of the six firms that were excluded, one was too old (22 years) to be considered a born global and the remaining five firms had their first international sale more than three years after their inception (4 years, 4 years, 8 years, 10 years, and 13 years).

Table 2 shows all of the 14 investigated biotech SMEs in 2003 at the beginning of the study. Because the promise of treating case firms anonymously can be used as a way to encourage candor in responses (Ozcan & Eisenhardt, 2009), we chose to treat all case firms anonymously. To maintain this anonymity, the case firms are represented by numbers.

Table 2 The investigated biotech SMEs in 2003 at the beginning of the study⁷

	Develops and sells (business)	Found- ed	Year of first foreign sale	Number of staff	Foreign- sales subsidi- aries	Turnover (thous- ands of USD)	Net profit/loss (thousands of USD)	Inter- views
1	Tests for detection and monitoring of viral diseases	1984	1995	16	0	350	-3381	2
2	Products for biological control and plant growth stimulation	1996	1998	13	0	922	-1091	1
3	High-quality biochemicals for the life sciences industry	1995	1995/ 1996	10	0	1076	123	5
4	Products based on bioceramic technology	1987	2000/ 2001	22	0	84	-4648	2
5	Ready-made adjuvants for animal vaccine development	1999	1999- 2000	7	0	933	-516	2
6	Diagnostic products in the areas of veterinary medicine and food safety	2001	2002	25	0	2 450	-494	4
7	Products for DNA identification and quantification	1990	1998	12	0	0	-3158	1
8	Products aimed at predicting the onset of arthritic diseases	1998	2001	9	0	250	-1469	1
9	Products for genetic analysis in clinical research	1997	1999/ 2000	90	5	11950	-24 256	4
10	Microfluidic solutions for the life sciences industry	2000	2000/ 2001	70	3	639	-28 048	5
11	Microsystems for the life sciences industry	1998	1999	29	0	2012	-2725	11
12	New drugs and dosage forms for improved drug treatment	1995	1997	19	0	2756	-3075	1
13	Medical devices for the field of interventional cardiology	1988	1998	150	8	33 438	1469	2
14	Kits based on immunological reactions	1991	1994	26	1	4358	252	1

⁷ All of the case studies described in this chapter are still ongoing because we are continuously collecting data about the firms. We also plan to follow up on the progress of the firms in future interviews.

Data Collection

Silverman (1993) described validity as “truth: interpreted as the extent to which an account accurately represents the social phenomenon to which it refers” (p. 149). Validity can also be broken down into three main categories: construct validity, external validity, and internal validity. Construct validity can be understood as the extent to which objective constructs are used in data collection, whereas external validity refers to the applicability of a study’s findings outside of that study. Internal validity refers to whether causal relationships are accurately captured, and therefore, it is a concern in causal (or explanatory) studies (Yin, 2003). Reliability refers to the degree of consistency with which instances are assigned to the same category by different observers or by the same observer on different occasions (Silverman, 1993). Essentially, reliability is concerned with to what extent a study is free from error and biases and whether we would obtain the same results if we could observe the same thing twice. When collecting the data, we made a conscious effort to mitigate informant bias and other biases and to provide detailed accounts of our actions to increase the validity and reliability of the findings. These measures are discussed in more detail below.

In the data collection process, we considered the biotech firms to be the units of analysis. To investigate their interaction with counterparts in foreign markets, experiential knowledge development, and internationalization, we used multiple sources of evidence. Utilization of data collected from multiple sources at multiple times strengthens confidence in the accuracy of findings (Jick, 1979; Ozcan & Eisenhardt, 2009). Hence, the data sources that we used to perform the qualitative study were collected at different points in time and consisted of the following: (1) semi-structured face-to-face interviews with key informants, (2) follow-up interviews with key informants via e-mails and phone calls, (3) observational data based on our own observations when interacting with informants at the investigated firms, (4) background interviews with experts in the biotech field, and (5) extensive archival data.

We chose to conduct interviews with the group of founders and managers who had been responsible for managing the firms’ internationalization. The first interviewees were always (one of) the founders. These persons, in turn, helped us to identify other staff members who had been most involved in handling the internationalization processes of the firms. We collected face-to-face interview data in most firms in several waves during the period between 2003 and 2005. A total of 42 interviews were conducted with key individuals at the 14 firms. The duration of the interviews ranged from 40 to 160 minutes per interview.

By interviewing the founders and managers, we wanted to hear the narratives about the case firms’ international operations and development. To strengthen the external validity of the multiple case studies, we followed an experiment-like replication logic when collecting the data (Yin, 2003). To ensure that the same topics were covered at all of the firms, we utilized an interview guide combined with a semi-structured interview style. This style is

suitable when the understanding, knowledge, and insights of the interviewees are of interest (Rubin & Rubin, 1995).

Our goal in conducting the interviews was to create an overview of how the firms interacted with their counterparts in foreign markets, how experiential knowledge was developed, and how the previous and current internationalization occurred. We always began by asking some questions about the firm's history and the respondent's history. We subsequently asked questions about the firm's present activities and organization. In particular, we focused on questions concerning how each of the firm's foreign business relationships was carried out, including its time of creation, circumstances of initiation, duration, and reasons for termination (if applicable). In addition to questions about the firm's internationalization and foreign business relationships, the development of the firm in terms of changes in product categories, staff, and growth was charted during the interviews. Finally, some questions always touched upon the future (e.g., the firm's expectations, goals). Some examples of questions included in the interview guide are as follows: What is your educational and professional background (in universities, firms, organizations)? How did your firm get in contact with its first foreign customers? Did the firm face any obstacles or problems in its internationalization? How has the firm handled these problems? The interview guide was departed from only when particularly interesting topics arose. Follow-up questions were also asked, depending upon what was said in the interviews.

As seen in Table 2, some of the investigated SMEs were visited only once, whereas others were paid several visits. In addition to visiting the investigated firms, we conducted follow-up interviews (typically via telephone or e-mail) with respondents who provided information about specific aspects. We were also in contact with the key informants to receive feedback on drafts of the cases.

Another source of data came from our own observations made in conjunction with our visits to the firms and the interviews conducted with the firms' staff members. All of the interviews, except for one that was conducted at a trade fair, were held at the firms' head offices in Uppsala. When visiting the firms, we were given a guided tour of their production units, R&D departments, marketing departments, and other locations and were able to observe how the staff members at the firms work. These visits helped us form a more in-depth characterization of the individuals and places that we visited (Creswell, 2003).

To learn more about the biotech field and control stories related by key informants, we also interviewed two industry experts connected to venture capital firms with an economic interest in the biotech field. They were used as independent sources of data. Moreover, we complemented our interview data with archival data to understand the history of the firms and the events that the interviewees had described. The archival data included business publications (e.g., business articles from databases⁸), Internet sources (e.g., firms'

⁸ SwedenBio (<http://www.swedenbio.com>) and Affärsdata (<http://www.affarsdata.se>)

homepages, master theses in business administration), and corporate materials (e.g., annual reports). The use of multiple sources of evidence is particularly important for strengthening the construct validity of a study. By using an extensive mix of data sources collected from our own observations, interviews with experts, and archival data, we found support for the stories told by the key informants in the interviews. By interviewing several people in some of the investigated firms more than once, we increased the confidence in our empirical data.

To increase further the reliability of the qualitative study, we kept a detailed account of our activities in different case protocols. Because we always knew that the people we interviewed were the right people to answer our questions (the key informants), this also increased the reliability of the interview data.

When collecting the data for the qualitative study, my colleague, Sara Melén, and I conducted all but four of the interviews together. Because we were both present for the vast majority of the interviews, we were able to alternate the tasks of handling the interview questions and writing notes. We also tried to take advantage of our different insights and perspectives when analyzing what we saw and heard during the interviews. Eisenhardt (1989) argued that multiple investigators can enhance the creative potential of the study, as well as the likelihood of capitalizing on any novel insights that may be found in the data. Because the goal of reliability is to minimize errors and biases, the enlistment of two researchers may also ensure the validity of data and increase the reliability of a study because the convergence of observations from multiple investigators enhances confidence in the findings.

Methods of Analysis

The questions in the interview guide that we used in our interviews were based on our previous knowledge about interaction, knowledge development, and internationalization, which we had acquired during the literature review. For this reason, the first part of the qualitative study can be described as being rather deductive because we started our empirical data collection with a theoretical framework in mind.

The literature review guided us in our choice of empirical sample and which questions to ask the investigated firms. After the interview data, observational data, and archival data had been collected, case protocols were created. These included transcripts of the audiotape recordings from all of our interviews, transcripts of our field notes and observations, and transcripts of the archival data. Thereafter, content analyses were performed to sort and transform the data that we had collected about each firm into chronological, individual case histories. These histories included, for example, information about the backgrounds of the founders and information about the case firms' interactions with important business counterparts. In the instances where we lacked necessary information, we followed up the interviews with e-mails and telephone calls to employees at the investigated firms.

After writing the case histories, we used them to perform within-case analyses of the firms. This type of analysis particularly focused on aspects of change relating to an individual firm's interaction with foreign counterparts, experiential knowledge development, and internationalization. When performing these analyses, we were two researchers who reviewed the cases to form independent views.

The next step was to perform cross-case analyses of the investigated firms so as to identify patterns and trends across different firms relating to their interaction, experiential knowledge development, and internationalization. Also in this process, two researchers were involved. For this type of analysis, we made use of tables to compare the firms under study and to highlight similarities and differences. For each of the investigated firms, tables were created that listed their relationships with important personal and business counterparts. In the cases where the interaction with counterparts had led to realized business transactions, the tables also listed what kind of business was conducted within the relationships and which internationalization mode was used. The tables were also used to highlight certain events that we regarded as particularly important for the firms' experiential knowledge development and internationalization (e.g., the grafting of a new CEO who could provide the firm with access to new business networks and markets). To maintain closeness to the data, quotations were frequently used in the tables to stress certain points.

From our previously conducted literature review and the emerging themes in the cross-case analyses, we formed tentative relationships (e.g., if a founder had a high level of experiential knowledge about internationalization, did this influence the firm's choice of high-commitment internationalization modes?). We then refined these relationships via replication logic, continuously revisiting each case to compare and verify the occurrence of specific relationships (Eisenhardt, 1989). We also added comparisons with the extant literature to highlight similarities and differences and sharpen construct definitions, among other things (Ozcan & Eisenhardt, 2009).

Figure 2 portrays a model that provides a general overview of how the qualitative study was conducted. In summary, the qualitative study started out with some initial questions that we wanted answered. These questions were based on our previous understanding of theory relating to the areas of interaction and internationalization research, network research and knowledge research. With these questions in mind, we decided on a sample and began the data collection process. Case protocols were created that were constantly updated with the latest information (e.g., telephone interviews with key informants and collection of new archival data about the investigated firms). We also continued to read more studies relating to our research areas of interest. Next content analyses were performed, and case histories were written. Finally, within-case and cross-case analyses were conducted. The results that emerged in the within-case and cross-case analyses were, thereafter, reported in different research papers (some of which are included in upcoming parts of this dissertation). The performance of a continuously

developed, longitudinal, multiple case study is a long and time-consuming process. For this reason, questions were sometimes revised as new and interesting studies in our areas of interest were published and new empirical findings from our case firms were acquired. The broken arrow in Figure 2 indicates that it was sometimes necessary to move back and forth between the discovery of new literature and the collection and analysis of data to sharpen and update the arguments made in the resulting research papers.

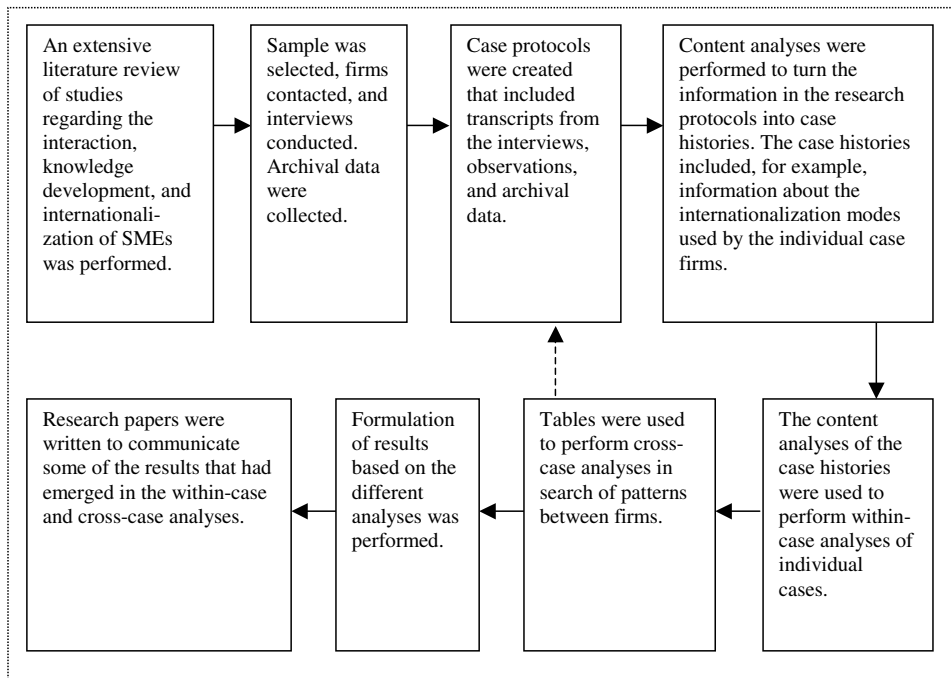


Figure 2 Model of the Collection, Analysis, and Communication of Results of Qualitative Data in the Dissertation.

The Quantitative Study

The research performed within the framework for the quantitative study is being carried out in cooperation with other researchers in a research project called “Internationalization in networks (Inet).” The Inet project’s aim is to develop the understanding of how firms can turn the risks of foreign expansion into opportunities and continued growth.⁹ The other members of the research group working on this project are Associate Professor Jukka Hohenthal in the Department of Business Studies at Uppsala University; Professor Kent Eriksson, Assistant Professor Jessica Lindbergh, and Sara Jonsson, Ph.D., at

⁹ For more information about the Inet project, visit <http://www.hhs.se/CMDID/Research/Pages/InetInternationalization.aspx>

the Center for Banking and Finance, Royal Institute of Technology; and Professor Dharma Deo Sharma, Assistant Professor Angelika Lindstrand, Sara Melén, Ph.D., Angelika Löfgren, M.Sc., and Daniel Tolstoy, M.Sc., in the Department of Marketing and Strategy at the Stockholm School of Economics. The results of previous qualitative and quantitative studies conducted by different members of the Inet project were used as points of departure when the project members (also referred to as *we* or *the investigators*) in 2004 started to develop a questionnaire regarding SMEs' interaction in foreign network relationships, experiential knowledge development, and internationalization.

The Questionnaire¹⁰

The purpose of the quantitative study was to increase our understanding and knowledge of how SMEs interact in foreign business relationships and develop experiential knowledge during their internationalization. The knowledge of what affects the experiential knowledge development in networks and the effects of learning in networks is limited. To generate such knowledge, a questionnaire was constructed. Through this questionnaire, we collected data on SMEs' networks of exchanges. We also mapped the relationships that SMEs have with Swedish and international customers, customers' customers, suppliers, suppliers' suppliers, complementary suppliers, competitors, consultants, banks, and financial institutions.

The questionnaire was based on questions that emerged during previous literature reviews and studies performed by the members of the Inet research project. The case studies that Sara Melén and I conducted about SME internationalization were used as information sources for the questionnaire (e.g., Melén, Rovira, & Sharma, 2004; Rovira, Melén, & Sharma, 2005). Other information used in constructing the questionnaire came from the case studies about knowledge development in networks that previously had been carried out by other members of the Inet research project (e.g., Blomstermo & Sharma, 2004; Lindstrand, 2003b). Further information came from the surveys that had previously been developed by project members (e.g., Blomstermo et al., 2004; Eriksson et al., 1997; Hohenthal, 2001). These sources of information were used to formulate the questionnaire. In contrast to previously developed questionnaires, this questionnaire used a new combination of questions on a scenario and perceptive measures of development, transfer, and utilization of knowledge. A 7-item categorical scale, ranging from low to high, was used to check the respondent's views on the various questions.

The questions in the questionnaire revolved around a certain critical, international, real-life business relationship, which the respondents were allowed to choose for themselves. The respondents were asked to rate how important various types of experiences have been in carrying out the assignment and what influenced the development of the experience: personal ties, network configuration, previous knowledge, and contents of the relationships in the network. The respondents were also asked to rate the types

¹⁰ See the complete questionnaire in Appendix I.

of knowledge the firm lacked and how difficult it was to gather new knowledge about these issues. Some subjective performance questions were also asked so that we could compare the answers to the objective information that was also collected about the respondents' firms.

Before distributing the questionnaire to a larger sample, we tested it on six SMEs in Stockholm and Uppsala. We visited the people who were to fill out the questionnaire at the firms where they worked. We were present in the room while they completed the questionnaire, and they were informed to tell us if they experienced any problems with any of the questions asked. All six indicated that they thought the questionnaire was too extensive. After receiving the results of the six questionnaires, the research group met and evaluated the test. After discussing what could be done to improve the questionnaire, we shortened it and changed certain expressions that some of the test subjects had found confusing. To enable as high a response rate as possible, we decided to attach an introductory letter to the questionnaire to assure the respondents that the results of the study would be treated in a confidential manner.¹¹

The Swedish version of the questionnaire that was distributed to the respondents was 14 A4 pages long (15 pages in the English version) and included the measurement of 322 variables. The questionnaire was divided into three parts. The first part was designed to answer general questions about the firm that could not be collected from secondary sources. These questions addressed, among other things, how many patents the firm has (if any) and how many new customers to whom the firm has sold products or services during the past year. The second part of the questionnaire was devised in an effort to map the respondent firm's relationship with a specific international business partner (a customer, distributor, or another intermediary). The questions in this part concerned, among other things, the importance of the specific business relationship in terms of developing new products, technology, and knowledge. The last part of the questionnaire endeavored to map the local and international business networks of the firm and the actors that surround the specific business relationship. This part of the questionnaire also posed questions about knowledge drawn from past experiences.

In addition to the questionnaire, background data about the firms were collected from two secondary sources, Statistics Sweden's Business Register¹² and Affärsdata.¹³ The objective data included information about age, size, export, year of international presence, financial information, and products. The objective data encompassed 29 variables in our database.

¹¹ The introductory letter is included in Appendix 1.

¹² Statistics Sweden's Business Register (http://www.scb.se/Pages/List____19852.aspx) provides information about the export behavior of Swedish SMEs.

¹³ Affärsdata (<http://www.affarsdata.se>) is a database that publishes the bookends for all Swedish corporations four years back in time.

Sample

A stratified random sample of Swedish SMEs was acquired from Statistics Sweden's Business Register in 2003. One common characteristic of the firms in this sample, which belongs to all kinds of industries, was that at least 10 percent of their turnovers are from export sales. The sample consisted of two groups of SMEs: small firms (6–49 employees)¹⁴ and medium-sized firms (50–249 employees). From each of these two groups, we received a sample of 1000 firms. The total sample covered about 28 percent of the Swedish small exporters that we were interested in investigating and 90 percent of the medium-sized firms. The motivation for the stratified sample was simply to create a variation in size among the SMEs. We expected that differences would exist among firms of various sizes and that a random sample from the whole population of firms would give us a large group of small firms. Firms with 50 or fewer employees make up about 97 percent of all Swedish firms. The two subsamples were also used to perform group analyses.

To ensure a high response rate, the questionnaires were collected by conducting personal visits to the sample firms. Because of the time-consuming nature of this collection method, only SMEs in a single geographical area (Mälardalen) were surveyed so as to minimize the collection time required. Mälardalen is a densely inhabited province around Lake Mälaren, with a population exceeding 2.7 million residents. The region encompasses several prominent cities in Sweden, including the capital of Stockholm, the university city of Uppsala, and the industrial city of Västerås. Other major cities situated in Mälardalen include Enköping, Eskilstuna, Södertälje, and Strängnäs. The region showcases a multiplicity of business initiatives and industrial clusters. For instance, Västerås exhibits notable examples of spin-offs from the heavy manufacturing industry, whereas there is a contrasting flurry of science-based firms that have developed from academic communities in Uppsala. The Stockholm area, moreover, contains firms from a wide range of industries, largely reflecting the general demographic multidimensionality of this subregion. Given the overall structural diversity of Mälardalen (i.e., infrastructure, demographic characteristics, and economic distribution), combined with the fact that it makes up over 30 percent of Sweden's total population, the region can be argued to be fairly representative for the country as a whole.

The derived sample of firms from the Mälardalen area consisted of 339 firms. After individuals at these firms were contacted by phone, some firms were excluded because they were too large (i.e., they were not SMEs), they did not sell their product to foreign customers (i.e., they were not internationalizing), or they no longer existed. After this reduction, the total sample consisted of 233 SMEs.

¹⁴ Micro-enterprises are enterprises that have at most 10, or in some cases 5, employees (OECD, 2002). Because previous studies have suggested that these micro-enterprises have behaviors that often are significantly different from those of other SMEs (Becherer, Finch, & Helms, 2006; Jay & Schaper, 2003), we excluded these enterprises from the sample.

Data Collection

The quantitative study used a single key informant approach. Even though this is a common practice in marketing research (Phillips, 1981), the use of multiple informants would provide a more rigorous data collection procedure. One measure to alleviate some of the potential problems with using single key informants is to choose a particularly appropriate key informant to answer the questions (Kumar, Stern, & Anderson, 1993). For this reason, the Inet project members invested a considerable amount of time to identify the correct key informant in each firm to answer the questionnaire. People who were considered key informants and singled out as such included chief executive officers (CEOs) and marketing managers who influence decisions related to foreign operations. Because we wanted to ensure a high response rate with a low number of missing values, we decided to visit the key informants at their workplaces to distribute and collect the questionnaires personally. Each visit ranged from one-half to one hour in duration. When the respondents had completed the questionnaires, the investigators conducted short interviews with them, encouraging them to describe in their own words the foreign assignments around which the questions had revolved. For each interview, the investigators made notes on blank sheets of paper attached to each questionnaire. Data were collected in this manner from 188 of the 233 SMEs in the sample.

Non-responding Firms

About 19 percent of sample firms decided not to participate in the study. The two major reasons for the non-responding firms' refusal to participate were a lack of time and a reluctance to release information. Even though a response rate of 81 percent is quite high in comparison with other similar studies, non-response bias is always a concern. Because the surveys were collected when meeting with the respondents, the investigators could not detect non-response bias by applying a common test such as comparing early versus late responses (Armstrong & Overton, 1977). Instead, secondary data collected from the Statistics Sweden's Business Register were used to control for differences between responding and non-responding firms with regard to industry, size, location, and level of internationalization. This analysis revealed no differences between the groups, and a non-response bias is, therefore, not likely to be a problematic issue when interpreting the findings of the quantitative study.

Validity and Reliability

The variables used in the questionnaire were created from measurements that are accepted in international business and international marketing literature. The variables were, moreover, based on the literature review that had been conducted in the search for new measurements, the research group's previously designed questionnaires, and previously performed qualitative studies. Even so, it was critical to submit the correct meanings and natures of the variables to additional testing before distributing the questionnaire to the sample firms. To

test the reliability of the variables further, we tested it (as stated earlier) on six firms during the spring of 2004. These tests revealed that the respondents had to have a comprehensive view of the firm's foreign operations so as to answer all the questions in the questionnaire. The person who was most suited to fill out the questionnaire was, therefore, the CEO or the marketing manager.

As mentioned earlier, we visited the SMEs and administered the questionnaires in person. By visiting the firms, we sought to ensure a strong reliability by making certain that it actually was the key informants (in the form of CEOs or marketing managers) who were answering each questionnaire. The investigators made appointments with the CEOs or marketing managers at the firms by telephone. The firms were then visited, and the investigators waited as the respondents filled out the questionnaire. To avoid investigator-induced bias, the respondents filled out the questionnaires themselves; the investigators were present solely as observers. During the time that it took for the respondents to fill out the questionnaire, the investigators did not intervene unless the respondents asked a direct question. In the cases where the respondents had specific inquiries about the meaning of a variable in the questionnaire, the investigator was prepared to answer. Before the investigators visited the companies, a meeting had been held in which we decided how we were going to answer every question that could come up. We did this so as to offer all the respondents the same interpretation regarding the questions in the questionnaire.

At some of the firms we visited, the respondent was unsure about one or two questions. The respondent was then allowed to call or go and ask another person at the firm who had the correct information. In so doing, the reliability of the data collected was increased. In summary, this data collection method ensured that the correct person in the sampled firms answered the questionnaire, thus strengthening the reliability of the collected data. This collection method also greatly reduced the occurrence of missing values.

LISREL Analysis

To process and analyze the quantitative data, we used the linear structural relations (LISREL) statistical package. The LISREL technique is usually applied to research involving confirmatory analysis. This method thus requires that a researcher anchor a model in theory, a requirement taken into consideration as we developed the questionnaire based on an elaborate theoretical framework.

Interpretation of a valid structural model should take into consideration that each relationship is part of a broader context constituted by the model. Such interpretation should take into account not only direct effects but also indirect effects. One example is a causal chain, where construct *a* causes construct *b*, and *b* causes *c*. In this chain, *a* has an effect on *b*, and *b* has an effect on *c*. Furthermore, *a* has an indirect effect on *c*, mediated by *b*. An analysis that omits the indirect effect mediated by *b* will suffer from inadequacies because it will not reveal the total effect that *a* has on *b* (Bollen,

1989). This implies that the relationships cannot be analyzed piece by piece; all constructs must be evaluated within the framework of an entire model.

The validity of LISREL models is measured with regard to both the validity of the entire model (nomological validity) and the specific relationships within the model. Because LISREL models consist of various constructs, their validity may be estimated by measuring the degree of separation between constructs (discriminant validity), as well as the degree of homogeneity of these constructs (convergent validity). Convergent validity is confirmed if the indicators load only on the constructs to which they belong. Evaluation of convergent validity is done by analysis of *t*-values (significance), *R*²-values (linearity), and factor loadings (correlation). A basic requirement for confirmation of discriminant validity is that the correlation between latent variables should be significant but not equal to 1, which would suggest unidimensionality (Jöreskog & Sörbom, 1993).

The overall fit of LISREL models is checked by using chi-square, degrees of freedom, and a probability estimate (*p*-value). An ongoing debate exists about the appropriate measures to use for assessment of nomological validity (Bollen & Long, 1993). Three frequently used measures are goodness of fit (GFI), which checks for sample size effects and should be above 0.90; root mean square error of approximation (RMSEA), which measures population discrepancy per degree of freedom (df) and should be below 0.08; and comparative fit index (CFI), which checks for non-normal distributions. CFI close to 1 indicates a good fit, and values above 0.90 indicate an acceptable fit (Jöreskog & Sörbom, 1993).

Introducing the Papers

On the basis of the theoretical background and the description of research processes and research design that were presented in the previous sections, the next part of the dissertation introduces six of the papers that have been written within the framework for my dissertation project¹⁵. In different ways, the six research papers presented in this dissertation fulfill the purpose of enhancing our understanding of internationalizing SMEs by investigating how interaction relate to experiential knowledge development and internationalization. The first three papers provide answers to the first key research question (i.e., *How do different means of interaction that SMEs employ in their foreign business relationships relate to their experiential knowledge development and internationalization?*), whereas the last three papers focus more on providing answers to the second research question (i.e., *How do the quality and quantity of interactions between SMEs and their foreign business relationships relate to their experiential knowledge development and internationalization?*) (see Figure 3). All of the papers, except the last two, are based on qualitative data. The last two papers are based on quantitative data.

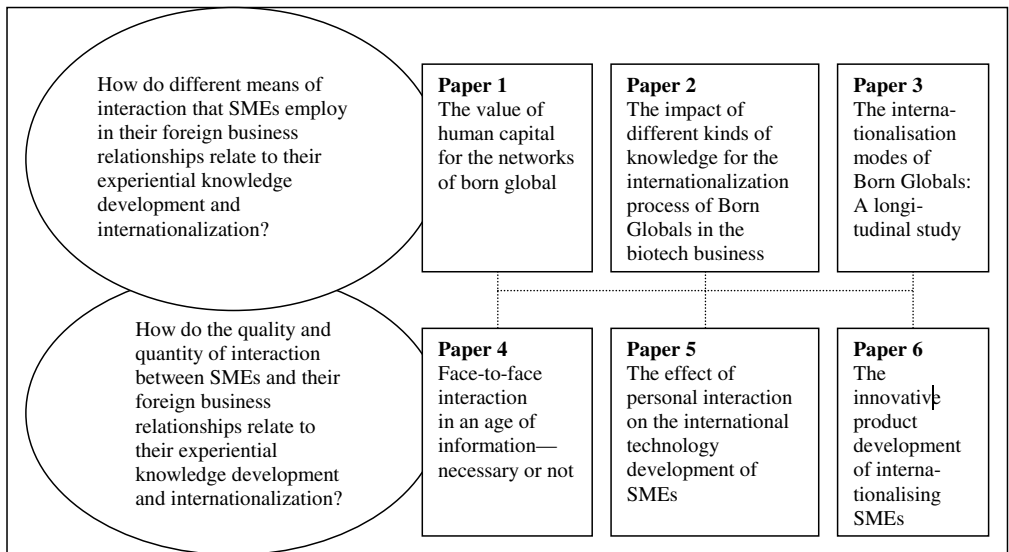


Figure 3 The Structure of the Papers.

¹⁵ In addition to the studies that are presented in this dissertation, recent articles published within the framework for the research project include studies about the importance of knowledge supplied by foreign network relationships (Lindstrand et al., 2009; Tolstoy, 2009) and the importance of specific customer knowledge (Melén, 2010 forthcoming) for the internationalization of firms.

Paper 1: The value of human capital for the networks of born globals

Published in: *International Journal of Globalisation and Small Business*,
2007, 2 (2), 205-219.

Co-authored with Dr. Sara Melén, Stockholm School of Economics¹⁶.

The purpose of paper 1 was to explore how a particular kind of internationalizing SME, namely, a born global, learns by using the personal and business networks of the staff during its internationalization and how human capital influences this learning process. To investigate these questions, an in-depth, longitudinal case study was performed on a born global firm that is active in the Swedish biotech industry.

The case study revealed that the use of different kinds of networks changed over the course of an SME's internationalization. In the establishment phase, the founder's experiences and personal network were used to acquire knowledge of potential foreign-customer relationships because the business network, including foreign-customer relationships, was still under development. In this phase, the staff believed that the necessary experiential knowledge about international sales was incorporated in the founder and the founder's personal network. Hence, the case firm's internationalization was characterized more by interaction in personal-network relationships than by interaction in business-network relationships. This situation, however, changed in the later stages of internationalization when it became evident that interaction in the founder's personal network could no longer provide the firm with the knowledge needed for initiating new foreign-customer relationships. Instead, the firm commits additional resources to further its internationalization by appointing six account managers to focus on the interaction with new foreign customers and to develop the firm's business network. This, however, did not solve the firm's problems, and as a consequence, a new CEO, with a different set of experiential knowledge and network resources, was grafted to gain the new customers the firm needed to survive.

Paper 1 contributed findings regarding the role of a founder's human capital in an internationalizing SME's learning process. The study specifically showed that the learning process of the firm does not start at the firm's inception but rather at the phase prior to its establishment. Previously acquired experiential knowledge thus guides the initial internationalization of the firm. The analysis, moreover, revealed that the human capital of employees influences the firm's initial learning processes. For example, human capital influences the network learning of the firm by affecting the conditions in which learning occurs. This implies that differences in human capital influence which foreign business relationships are established and where interactions and

¹⁶ The authors contributed equally to the paper.

learning take place. Overall, the paper contributed to the understanding of internationalizing SMEs by showing that different groups of staff members have interactions in foreign business relationships that influence the experiential knowledge development of the firm in different ways, and, as a consequence, the firm's customer focus and internationalization change.

Paper 1 discussed how human capital and interaction in different kinds of networks influence an SME in its internationalization. It also discussed the particular challenges that rapidly internationalizing SMEs have to face in their quest to interact in foreign business relationships and, thus, acquire necessary experiential knowledge about foreign markets. The interest in exploring these challenges further and seeing if differences exist in the way that born global firms interact in foreign business relationships and how this relates to the experiential knowledge development and internationalization of different born global firms led to the development of papers 2 and 3.

Paper 2: The impact of different kinds of knowledge for the internationalization process of born globals in the biotech business

Published in: *Journal of World Business*, 43 (2), 171-185.

Co-authored with Dr. Sara Melén, Stockholm School of Economics¹⁷.

The second paper was based on data from all eight of the biotech firms that were defined as born globals in the qualitative study. The purpose of this study was to explore how the levels of international knowledge and technological knowledge of founders and managers at these eight born global firms are related to the firms' discovery and exploitation of foreign market opportunities. International knowledge was defined in this paper as experiential knowledge about conducting business within an international setting, whereas technological knowledge was defined in this paper as experiential knowledge about the technology upon which the born global firm's products are built.

The results of the study showed that all eight born globals were initially managed by staff members with high levels of technological knowledge. Technological knowledge was also shown to have had a positive impact on the early internationalization of the investigated firms. By conducting an extensive empirical comparison of the eight firms, we saw that the firms, however, could be divided into two different groups based on apparent differences in international knowledge between the firms' founders and managers. Because these differences in international knowledge had such a strong bearing on the internationalization processes in these firms, we chose to dichotomize the concept of born globals into two subgroups: born industrials and born academics. Born industrials are characterized by their founders' and managers' combinations of high levels of both technological and international knowledge, whereas born academics are characterized by their founders' and managers' combinations of high levels of technological knowledge and low levels of international knowledge.

When analyzing the two groups of born globals, we argued that search activities reflect proactive behavior, whereas ongoing interactions with individuals in a specific foreign market reflect reactive behavior. Building on this idea, the analysis revealed that the discovery of foreign market opportunities by born industrials was driven by proactive behavior. By contrast, ongoing interaction in foreign business relationships aided the born academics in discovering foreign market opportunities. This reactive behavior influenced the born academics to be more flexible than born industrials because the discoveries made by the born academics were a consequence of chance rather than of a proactive search.

¹⁷ The authors contributed equally to the paper.

The analysis also showed that born industrials facilitated the interaction in important foreign business relationships by committing more resources to foreign markets in their initial investments. Hence, these companies generally invested in more committed internationalization modes than did the born academic firms. This enabled the born industrials to exploit their foreign market opportunities more rapidly than did the born academics. By contrast, born academics generally exploited their opportunities in a more incremental manner. These findings suggested that born industrials tend to internationalize more rapidly than born academics.

By presenting findings that the internationalization processes of born global firms differ because of the differences (i.e., level and type) in knowledge of founders and managers, this study contributed to the understanding of internationalizing SMEs in general and born globals in particular. In contrast to existing born global research, which has almost always regarded born globals as a homogenous group of firms, this study showed that born globals need to be seen as heterogeneous groups so that we may gain a deeper understanding of these firms' internationalization behaviors. The study, moreover, contributed to the understanding of internationalizing SMEs by showing that the use of certain interaction means (e.g., the use of the employees' previously developed business relationships to find new staff or useful advice) influences the way that the born globals develop experiential knowledge and internationalize.

Paper 3: The internationalisation modes of Born Globals: A longitudinal study

Published in: *European Management Journal*, 27 (4), 243-254.

Co-authored with Dr. Sara Melén, Stockholm School of Economics¹⁸.

The third paper was based on the same empirical material as paper 2. The purpose of this study was to explore which internationalization modes born globals use during their internationalization and the effects of these modes on the development of foreign customer knowledge. In this study, the definition of internationalization modes was, furthermore, broadened to include both the internationalization modes used by firms when they first enter foreign markets and those used in their continued internationalization. Foreign customer knowledge is defined as experiential knowledge of foreign customers.

The cross-case analysis of the internationalization modes of eight born globals showed that the firms followed different types of internationalization behavior, thus leading to the development of different kinds of foreign customer knowledge. Three broad patterns of internationalization behavior could be identified, which led us to divide the born globals into three groups. We referred to the first group as the *low committers*. These firms began their internationalization by using low-commitment internationalization modes, such as direct export modes. The low committers typically acquired general customer knowledge from their limited interaction with foreign customers. This is a kind of foreign customer knowledge that captures an internationalizing firm's knowledge about the general characteristics of foreign customers and knowledge about how to interact with them. The low committers did not engage in high-commitment modes or change internationalization modes during their internationalization.

The second group, called the *incremental committers*, began their internationalization using low-commitment internationalization modes such as agents or distributors. By interacting in these business relationships, the incremental committers were able to acquire general customer knowledge; however, in their continued internationalization, they also changed their internationalization mode in some markets. Similar to the low committers, these born globals demonstrated a form of internationalization behavior that supports the incremental, stepwise view of internationalization.

The third group, called the *high committers*, began their internationalization by using high-commitment internationalization modes to facilitate the interaction in foreign business relationships in their most important foreign markets and low-commitment internationalization modes in less important foreign markets. In the high-committers continued internationalization, their behaviors point to two different paths: (1) a

¹⁸ The authors contributed equally to the paper.

continued increase in resource commitments and use of high commitment internationalization modes and (2) a decrease in resource commitments demonstrated in the liquidation of high commitment internationalization modes, such as foreign subsidiaries. The great variety of internationalization modes used and customer relationships developed enabled these firms to acquire both general and specific customer knowledge in their initial internationalization. In contrast to general customer knowledge, specific customer knowledge is a kind of foreign customer knowledge that captures an internationalizing firm's in-depth knowledge about a foreign customer's needs, demands, and problem-solving approaches. The high committers demonstrated an initial internationalization pattern that supports existing born global research.

Paper 3 contributed to knowledge-based internationalization research by integrating concepts and dynamic views from the Uppsala-theory with research about the rapid internationalization of SMEs. The paper also extended the view of the born global phenomenon to include their continued internationalization. In so doing, we illustrated the different patterns of knowledge development found among these more mature born globals. Although previous research within the field of knowledge-based internationalization process theory has emphasized the importance of both general and specific experiential knowledge about foreign markets and indicated their importance for companies' performance in their international expansion, this study demonstrated that not all born globals acquire specific customer knowledge or even perceive the need for this knowledge.

The study also contributed to the understanding of internationalizing SMEs by showing that internationalization modes, and thus interaction in foreign business relationships, can vary greatly over the course of an SME's internationalization. The speed at which resources are committed to foreign markets to further the internationalization can also vary extensively between different groups of born globals.

Paper 4: Face-to-face interaction in an age of information — necessary or not?

Published in: *Managing Customer Relationships on the Internet*, (eds) A. Lindstrand, J. Johanson, & D. D. Sharma, pp. 245-266, Elsevier Science, Oxford, UK.

Paper 4 was based on two born global case firms from the qualitative sample. The aim of this study was to investigate the role that face-to-face interaction with customers still plays for born globals that compete in high-tech markets. More specifically, the study, attempted to investigate the question of how face-to-face interaction influences the factors of trust and uncertainty in the relationships between born global SMEs and their customers.

The results of the analysis indicated that a company's level of face-to-face interaction with customers is related to the level of uncertainty that the customers feel about working with the company. Customer uncertainty can, however, be reduced if the company provides useful information to their customers. The inducement of trust and the reduction of uncertainty are, moreover, important tasks for certain born global SMEs that compete in international high-tech markets because these kinds of companies often must convince their international customers to take the risk of investing in brand-new technology. The inducement of trust and reduction of uncertainty are particularly important for firms that act in a market that is signified by rapid technological change. By contrast, companies that sell products that are based on a more commonly accepted and standardized technology do not need to focus as much on inducing trust in their customers. These results suggested that even though it is generally less expensive to communicate with foreign customers with the help of IT solutions rather than face-to-face meetings, companies that utilize only this mode of interaction risk losing important opportunities. The increased commitment of resources to enable face-to-face interaction with foreign customers can lead to closer relationships with foreign business partners and an increased amount of experiential knowledge about foreign markets.

Paper 4 contributed to the understanding of internationalizing SMEs by showing that the quality and quantity of interaction in business relationships influence firms' internationalization in different ways. The findings of this study brought into question the view that rapidly internationalizing firms can rely solely on ICT tools to further their internationalization. Instead, the results of the study suggested that firms that are dependent on the development of innovative activities, such as the development of new products or new technologies, need to use a higher quality and quantity of interaction in business relationships to succeed with their internationalization. This thought is followed up in papers 6 and 7.

Paper 5: The effect of personal interaction on the international technology development of SMEs

Published in: *Small Enterprise Research*, **16** (1), 16-26.

Co-authored with Daniel Tolstoy, Stockholm School of Economics¹⁹.

The fifth paper was based on quantitative data from 188 Swedish SMEs. The purpose of this study was to examine the effect of personal interaction on international technology development in relationships between SMEs and their foreign customers. Personal interaction is regarded as the inclusion of the top modes of rich modality interaction (i.e., face-to-face communication and telephone communication)²⁰ whereas international technology development is viewed as the creation of new technology that underlies business operations in foreign markets (Yli-Renko et al., 2001). This paper also examined whether personal interaction may configure social settings in which knowledge can be transferred in foreign customer relationships. Knowledge transfer is viewed as the process by which knowledge is mutually shared between firms (Nonaka, 1994). From this investigation, three hypotheses were generated and tested in a structural model. This model was derived from the idea that the personal interaction of SMEs and their foreign business relationships will evoke knowledge transfer, which in turn will lead to international technology development. The direct relationship between personal interaction and international technology development was, moreover, investigated.

The results of the LISREL analysis showed that the effect of personal interaction on international technology development is not direct but is mediated by the construct of knowledge transfer. Hence, the study suggested that before international technology development can be enhanced, relationship knowledge transfer needs to be established. The reason for this is that personal interaction strengthens a certain relational mechanism between firms—namely, knowledge transfer, which in turn has positive effects on international technology development. The theoretical implication is that the increase in commitment of resources to foreign markets in the shape of personal interaction is a significant undercurrent for international technology development because it facilitates the instrumental construct of knowledge transfer.

¹⁹ The authors contributed equally to the paper.

²⁰ The construct of personal interaction was based on the following questions: “How many times does your firm have contact with [the selected foreign customer] via personal visits?” and “How many times does your firm have contact with [the selected foreign customer] via telephone calls?” Hence, the concept of personal interaction captured both the quantity and quality of interaction because the quantity of interaction was measured by the frequency of interaction and the quality of interaction was regarded as resource commitments in the shape of interaction modes, where personal interaction (i.e., face-to-face communication and telephone communication) was seen as higher in quality than leaner types of interaction (e.g., e-mail).

Overall, the results contributed to the understanding of internationalizing SMEs by showing that personal interaction is indeed important for SMEs' international technology development in customer relationships. A high quality and quantity of interaction between SMEs and their foreign business partners thus influence their internationalization. By showing that personal interaction still plays, and probably will continue to play, an important role in technology development in SMEs' foreign customer relationships, this study contributed to knowledge-based research on internationalizing SMEs.

Paper 6: The innovative product development of internationalising SMEs

Accepted for publication in: *International Journal of Learning and Intellectual Capital* (2010 forthcoming)

The sixth paper also built on the quantitative data. The purpose of this paper was to examine the impact of two kinds of experiential knowledge (relationship knowledge and network knowledge) on the knowledge development and innovative product development (IPD) of internationalizing SMEs. Relationship knowledge is defined as the experiential knowledge that a partner in a dyadic customer relationship has of a specific foreign customer, whereas network knowledge is defined as the experiential knowledge that an SME in a business network has about other network relationships that are active in the same market as the SME and its customers. Knowledge development is seen as the process of knowledge being developed, and innovative product development is regarded as an innovative activity leading to the development of at least one physical product that is either radically new or perceived as new by its developers (Van de Ven, 1986).

From the examination of the impact of relationship knowledge and network knowledge on the knowledge development and IPD of internationalizing SMEs, six hypotheses were generated and tested in a structural model. This model was derived from the idea that SMEs' interactions in foreign business relationships can initiate knowledge development, which in turn can lead to IPD, and that a relationship between experiential knowledge and innovation activities exists. The different sources of experiential knowledge that lead to knowledge development were in this study represented by foreign customers and other network relationships. The construct of personal interaction²¹ (in paper 6, called simply interaction) was, furthermore, included in the hypothesized model because previous research has indicated that rich modality interaction facilitates a more efficient transfer of experiential knowledge.

The results of the LISREL analysis showed that SMEs use experiential knowledge acquired from foreign customers and other network relationships as a means to acquire important knowledge that can be used for IPD. Another result of the data analysis concerned the role of interaction; both relationship knowledge and network knowledge proved to have a strong effect on interaction, which in turn positively influenced knowledge development and IPD.

The results enhanced the understanding of internationalizing SMEs by showing that the commitment of resources to foreign markets in the shape of a high quality and quantity of interaction between SMEs and their

²¹ The construct called interaction in this paper is built on the same variables as the construct of personal interaction in Paper 5 and is thus viewed as rich-modality interaction (i.e., face-to-face communication and telephone communication).

foreign business partners have an impact on the knowledge development and IPD of SMEs and, thus, on the internationalization of these firms. The paper also contributed to knowledge-based research about internationalizing SMEs by showing that experiential knowledge has an impact on knowledge development and IPD.

Discussion

Writing this dissertation has aided me in articulating and summarizing the research I have performed during these past couple of years. The six papers presented in the previous chapter all investigated SMEs' interaction in foreign business relationships, which influenced their experiential knowledge development and internationalization in different ways. This section of the dissertation will discuss the findings and contributions of the dissertation as a whole.

Findings and Contributions

The purpose this dissertation is to enhance our understanding of internationalizing SMEs by investigating how interaction relates to their experiential knowledge development and internationalization. In addition to being grounded in theory, the existence of relationships among interaction, experiential knowledge development, and internationalization is supported by common sense. Most people would agree that our past experiences influence us to take certain courses of action. They would probably also agree that personal interaction ought to be important for the reduction of uncertainty, the development of trust, and the support of creative processes that lead to the development of new technology and new products. Even though the relationships investigated in the dissertation are based on common-sense arguments, they still require academic investigation. By writing this dissertation, I am contributing to existing theory and providing knowledge about how these firms acquire experiential knowledge and internationalize. In particular, the dissertation aims to contribute to the development of theory that builds on the Uppsala behavioral internationalization process theory of firms and theory that focuses on the rapid internationalization of SMEs. These contributions will be further discussed in the coming sections of this chapter.

Implications of Research Question One

To fulfill the purpose of this dissertation, I answered two research questions. The first question asks: *How do different means of interaction that SMEs employ in their foreign business relationships relate to their experiential knowledge development and internationalization?*

To reiterate, the different means of interaction described in the dissertation are high-commitment internationalization modes, low-commitment internationalization modes, business network relationships, personal network relationships, and personal interaction. To investigate these means of interaction, theories that discuss firms' reasons for using different internationalization modes (e.g., the establishment chain and the Uppsala theory) and theories that discuss firms' reasons for utilizing different kinds of networks (e.g., business network theory, personal network theory, and social

exchange theory) were studied. To investigate the relationships among the different means of interaction, experiential knowledge development, and the internationalization of SMEs, theories that discuss different aspects of knowledge (e.g., the resource-based view and theories about tacit knowledge) and theories that discuss the phenomenon of the rapid internationalization of SMEs (e.g., international entrepreneurship theory) were also studied.

Offering support to previous studies emphasizing the importance of key employees' backgrounds for the internationalization of SMEs (e.g., Autio, 2005; McDougall et al., 1994; Melén, 2009; Wiedersheim-Paul et al., 1978), the results of the dissertation show that the means of interaction that the investigated SMEs employ in their internationalization are strongly influenced by the human capital of key employees (i.e., the resources embodied in the skills and knowledge of the founders and managers in the investigated firms). The results, moreover, show that the key employees of the investigated SMEs tend to use the same solutions that have proven successful in the past to solve the challenges of internationalization. Thus, the human capital of the key employees of SMEs influences the firms' choices of which means of interaction to employ, as well as their experiential knowledge development and internationalization. This result indicates that the impact of human capital resources is a relevant topic to explore when studying SMEs. In larger firms, the backgrounds of key employees would probably not have such a major impact on experiential knowledge development and internationalization as it does in SMEs, where the influence of only one person can make a great difference.

The Internationalization Modes of SMEs

The importance of the influence of key employees also has implications for the development of theory. Within internationalization theory, there is a general agreement that experiential knowledge is important for the internationalization of SMEs. Even so, there is still discussion about whether SMEs follow incremental or more rapid and simultaneous paths to foreign markets and whether they use low-commitment or high-commitment internationalization modes in this process.

The results of the dissertation show that the use of low- versus high-commitment internationalization modes in born global SMEs differs depending on the human capital of key employees. Key employees in born global SMEs can be categorized into groups depending on the human capital they have acquired during their previous careers. In contrast to previous studies about born globals, which argued that the key employees of these firms acquired international business experience from their previous careers (Madsen & Servais, 1997; McDougall et al., 1994), the findings of this dissertation show that some born global SMEs are, in fact, founded and managed by key employees with limited or nonexistent experiential knowledge about conducting business in an international setting (i.e., international knowledge) before the start of the firm. These key employees instead display high levels of

experiential knowledge about the technology upon which their firm's products are built (i.e., technological knowledge). However, other key employees who display high levels of both technological and international knowledge fit the profile described in previous born global studies. The different kinds of experiential knowledge possessed by the key employees of SMEs influence the levels of resource commitment that the firms choose in their interactions in foreign business relationships and foreign markets. Firms with key employees who possess high levels of international knowledge generally use high-commitment internationalization modes to reach foreign markets (e.g., sales subsidiaries). By contrast, firms with key employees who have limited amounts of experiential knowledge generally use low-commitment internationalization modes (e.g., direct export).

Scholars interested in the rapid internationalization of SMEs, have requested additional longitudinal research into which internationalization modes these firms use. One example of this is, Young, Dimitratos, and Dana (2003), who stated that "insufficient emphasis has been given to entry and subsequent market-servicing modes used" (p. 37). In accordance with these authors, Liesch, Weerawardena, Sullivan Mort, Knight, and Kastle (2007) have also suggested that more research be conducted on the continued internationalization of these firms. In response to these requests, we have performed longitudinal studies to investigate how born global SMEs develop experiential knowledge and internationalize over time. The longitudinal investigation of born global SMEs reveals that as internationalization progresses and the experiential knowledge development of the firms continues, different groups of firms exhibit different internationalization behaviors. Some of the firms that began their internationalization by using low-commitment internationalization modes (i.e. the low-committers) did not engage in high-commitment modes or change internationalization modes during their continued internationalization. Another group of firms (i.e. the incremental-committers) began their internationalization using low-commitment internationalization modes, but during their initial internationalization process, these firms developed experiential knowledge and business relationships that influenced them to change their internationalization modes in some markets. The last group of firms (i.e. the high committers) consists of firms that were founded by key employees who displayed high levels of international knowledge. The high committers began their internationalization using high-commitment internationalization modes in their most important foreign markets and low-commitment modes in less important foreign markets. During their continued internationalization, the high committers developed in different directions. On the basis of the experiential knowledge developed during its initial internationalization, one of the high committers showed a continued increase in the use of high-commitment internationalization modes, whereas the other firm in this group showed a decrease in resource commitment through the liquidation of high-commitment internationalization modes.

The application of different means of interaction to establish foreign business relationships and enter foreign markets differed within the

three groups of firms, and this, moreover, influenced their experiential knowledge development. In comparison with the other two groups of firms, the low committers' choice of low-commitment internationalization modes made it hard for them to develop experiential knowledge about their foreign customers. However, the strategic intent in several of these firms was not to increase their foreign market commitments during their internationalization. Instead, these firms were happy to continue with their export-activities. The incremental committers, on the other hand, increased their possibilities of interacting with foreign customers during their continued internationalization as they intensified their relationships with certain foreign customers. The high committers were the only firms to use high-commitment internationalization modes from the start, which allowed them to maintain a close and frequent interaction with their customers. This type of interaction facilitated the development of experiential knowledge about foreign customers and markets. Furthermore, the lessons that these firms learned when interacting within business relationships in foreign markets had relatively rapid effects on their continued foreign market commitment choices.

Following the discussion of whether SMEs follow incremental or more rapid and simultaneous paths to foreign markets, also a difference in opinion regarding whether firms are proactive or reactive in their internationalization behavior exists between the Uppsala theory and theories focusing on the rapid internationalization of SMEs. The results of this dissertation show that the proactive and reactive behaviors of internationalizing firms also depend on differences in the human capital of key employees. Firms that are managed by key employees with low levels of international knowledge discover foreign market opportunities in accordance with the reactive behavior indicated in the Uppsala theory whereas firms managed by key employees with high levels of international knowledge demonstrate proactive behavior toward the discovery of foreign market opportunities, thus supporting the arguments put forward in born global research. The proactive behavior of this group also allows them to exploit foreign market opportunities more rapidly by committing more resources to foreign markets in their initial investments.

In summary, the lack of consensus regarding which means of interaction firms employ to develop experiential knowledge and internationalize revealed a research gap that this dissertation set out to fill. Against this background, the results of the dissertation support previous studies showing no explicit pattern in the use of internationalization modes among born globals (Rialp et al., 2005; Sharma & Blomstermo, 2003). Some of the investigated firms exhibited the incremental and reactive behaviors predicted by the Uppsala theory, whereas others simultaneously used multiple and different internationalization modes and exhibited the proactive behaviors predicted in theory about the rapid internationalization of SMEs.

These results also emphasize the need to investigate born global SMEs from a heterogeneous perspective so as to understand their experiential knowledge development and internationalization. My dissertation contributes to the development of the Uppsala theory and to theories that focus on the

rapid internationalization of SMEs by showing that elements from both these theoretical perspectives is necessary for understanding the internationalization behaviors of all groups of born global SMEs. A need to investigate the human capital resources of key employees so as to explain the individual internationalization behaviors (i.e., the use of low-commitment or high-commitment modes, the use of proactive or reactive behaviors) of these firms also exists.

Although previous studies within the field of internationalizing SMEs have strongly emphasized that the speed of internationalization of born global SMEs differs from the internationalization pattern of large, established multinational corporations there has been a lack of studies that focus on the differences in internationalization processes that can exist within the group of born global SMEs. Hence, the results of this dissertation also contribute to existing research from an empirical point of view. Furthermore, we have provided an empirical contribution to the field by performing a longitudinal study about born global SMEs. This empirical contribution is particularly important because of the lack of such longitudinal studies in the existing literature. By performing longitudinal studies of born global SMEs, we had the opportunity to follow how different firms' internationalization changed in different ways during their internationalization processes. The results of these longitudinal studies particularly contribute to theory about the rapid internationalization processes of SMEs by showing that a rapid increase in resource commitments during the initial internationalization phase does not necessarily result in a rapid continued internationalization phase. Furthermore, a rapid internationalization is not an aspiration that all Born Globals share. Thus, by investigating born globals from a longitudinal viewpoint, a new perspective about the phenomenon of the rapid internationalization of SMEs was obtained.

Network Relationships of SMEs

One of the intended contributions of this dissertation was to enrich our understanding of how SMEs increase their experiential knowledge development and international involvement despite these firms lack of financial and human capital resources. The results of the dissertation show that key employees tend to sustain their relationships with previously established personal networks when conducting business in the new firm. To find the resources they need, the firms often turn to these personal network relationships. The relationships can, for instance, be used to accumulate market-specific information or to find local employees in a certain market. These results offer support to researchers who have argued that firm size does not necessarily correlate with firms' international activities (Johanson & Mattsson, 1987; Reuber & Fischer, 1997; Wennberg & Holmquist, 2008). Instead of size, the human capital of key employees has a strong influence on the international development of firms.

Nummela (2004), however, put forward the argument that the significance of the personal networks of key employees probably decreases as firms mature. Instead of relying solely on the old relationships, firms continuously establish relationships with new actors to acquire necessary resources. The results of this dissertation support this argument by showing that the use of personal network means of interaction to initiate foreign business relationships is particularly evident in the early internationalization processes of the investigated SMEs. Typically, key employees interact in their personal networks during the start-up phase to acquire knowledge of specific foreign market conditions and access to potential foreign-customer relationships, whereas the firms' business networks are still under development. When personal network relationships no longer can provide firms with the knowledge that they need for operating in foreign markets and initiating new foreign business relationships, they realize that they have to come up with new ideas to further their internationalization. In the later phases of internationalization, the SMEs, therefore, often have learnt that they need to go outside the boundaries of their established personal networks to find the business partners that they need and establish business relationships with them. These results also support research indicating that using a broader range of weak business relationships provides greater access to important knowledge resources than does drawing on contacts from a narrower group (Burt, 1982; Granovetter, 1973).

Scholars have identified grafting as way for firms to attain both knowledge (Forsgren, 2002; Huber, 1991) and access to important network relationships (Crick & Spence, 2005). The results of this dissertation support these arguments and show that grafting is frequently used by internationalizing SMEs as a way to obtain new sources of human capital and acquire new means of interaction with foreign business counterparts. Grafted key employees can use their personal networks to access knowledge that the internationalizing SMEs need. The results show that the use of grafting may be particularly important for born global SMEs when they enter new business areas in which the existing key employees have limited experiential knowledge and limited access to personal network relationships.

Opposing arguments have been put forward concerning whether the business networks or the personal networks of the key employees are more important for the internationalization of SMEs. In contrast to previous theories about rapidly internationalizing SMEs, which have argued that either personal networks (Andersson & Wictor, 2003) or business networks (Coviello, 2006) are more important for the international growth of these firms, the results of the dissertation show that both of these types of networks are important. Instead of focusing on the relative importance of personal or business networks for internationalizing SMEs, this dissertation maintains that the most important aspect for an internationalizing SME is the ability to learn from existing personal or business network relationships what knowledge and networks are needed in the different phases of its internationalization. By showing that internationalization depends not on which kinds of network relationships are used but rather on the knowledge of how and when to use those different

relationships, the dissertation contributes theoretical perspectives to the Uppsala theory as well as to theories that focus on the rapid internationalization of SMEs.

In summation, the results discussed under research question one indicate that because of key employees with different backgrounds, SMEs employ different means of interaction in an effort to form foreign business relationships. The choices made based on the human capital resources and network connections of these key employees influence the firms' experiential knowledge development and internationalization in different ways. Firms that have access to larger personal networks and business networks in foreign markets more often get the opportunity to internationalize in a rapid pace than other firms. Although the results of the dissertation show that differences in the use of internationalization modes and network relationships of Born Globals relate to differences in their development of experiential knowledge, and their pace of internationalisation, the results do, however, not clearly show that one particular group of firms is more internationally successful than the others.

Implications of Research Question Two

Research question two asks the following: *How do the quality and quantity of interaction between SMEs and their foreign business partners relate to their experiential knowledge development and internationalization?* To measure the quality and quantity of interaction, the construct of personal interaction (i.e., face-to-face communication and telephone communication) was used. To find out more about the effects of personal interaction on the experiential knowledge development and internationalization of firms, theories that discuss our reasons for using personal interaction in our dealings with others (e.g., media richness theory and theories about trust) were studied. To investigate the relationships among personal interaction, experiential knowledge development, and the internationalization of SMEs, also theories that discuss different aspects of knowledge (e.g., the resource-based view and theories about tacit knowledge) were studied.

The results of previous studies indicate that positive relationships exist among interaction in foreign markets, experiential knowledge development, uncertainty reduction, and increased resource commitment (Johanson & Vahlne, 1977, 2009). Other studies have, moreover, indicated a positive relationship between increasing trust and uncertainty reduction (McKnight et al., 2002). Trust is emphasized as being particularly important for allowing close technological cooperation to occur (Laage-Hellman, 1997). One way of building trust is to interact with business counterparts on a personal level because this kind of interaction acts as support for the development of trust in relationships (Nohira & Eccles, 1992). Building on the relationships discussed above, this dissertation also set out to investigate the role that interaction of high quality and quantity, in the form of personal interaction, plays for the experiential knowledge development and internationalization of SMEs.

Personal Interaction of SMEs

In support of the studies discussed above, the results of the dissertation show that personal interaction with foreign customers is important for creating trust, reducing uncertainty, and building lasting business relationships. Personal interaction is, moreover, an important means of interaction for SMEs that want to increase their experiential knowledge development about foreign markets. Personal interaction also has an effect on the commitment of resources to foreign markets (e.g., measured as the development of technology and new products together with foreign customers), which in turn influences the internationalization of the SMEs.

The results of the dissertation also show that SMEs' experiences from interaction in foreign network relationships are employed as a source of knowledge that is used for increased internationalization. Previous studies have shown that the strongest and closest business relationships, such as with customers, are not necessarily the most important in firms' business networks (Lindstrand 2003b; Lindstrand et al., 2009; Majkgård & Sharma, 1998; Sharma & Johanson, 1987). The results of the dissertation also support these studies, showing that in addition to experience gained from working with customers and suppliers, experiential knowledge attained from customers' customers serves as an important source of experiential knowledge that can be applied in international product development.

In terms of the importance of a high quality and quantity of interaction between internationalizing SMEs and their foreign business partners, this dissertation has discussed the opposing arguments that are presented in the Uppsala theory and in more recent studies that focus on rapidly internationalizing SMEs. Even though the Uppsala theory does not explicitly discuss whether personal interaction in foreign business relationships is particularly important for the development of experiential knowledge, it is strongly suggested because the Uppsala theory argues that experiential knowledge can be acquired only from a firm's own operations in foreign markets. Lituchy and Rail (2000) questioned whether incremental internationalization is even necessary for internationalizing SMEs when they can use the improved communication systems that are in place today. By contrast, research has indicated that personal interaction best enables an efficient transfer of tacit knowledge (Hansen et al., 1999; Murray & Peyrefitte, 2007; Romijn & Albu, 2002; Tödtling & Kaufmann, 2001). Because experiential knowledge development is such an important factor for explaining the internationalization of SMEs, personal interaction between business partners may provide a substantial edge over some ICT tools (e.g., e-mail)—especially for purposes of more complex knowledge transfer processes, such as those leading to the development of new technology and new products. The results of the dissertation also support this argument by showing that Internet and e-mail do not serve as a full substitute for personal interaction in all situations. Rich modality interaction in the form of face-to-face meetings is especially important when feelings of uncertainty and risk are involved in business transactions. Meeting their customers face-to-face is particularly

important for high-tech SMEs so that they can convince their customers to accept the risk associated with investing in brand-new technologies or products.

Even though previous studies have shown that SMEs have a higher propensity to engage in innovative activities in comparison to larger firms (Allocca & Kessler, 2006; Koskinen & Vanharanta, 2002), studies about how SMEs develop experiential knowledge, new technologies and new products together with foreign business counterparts are still scarce. The results of this dissertation shows that experiences acquired in interaction with foreign customers and other network partners located in the same foreign market as these customers, have a positive effect on knowledge development. This knowledge, can moreover, be used as a means for resource-constrained SMEs to develop new products and technologies together with foreign customers. Personal interaction is particularly important in this process because it strengthens relational mechanisms and facilitates knowledge development between firms.

By combining perspectives from media richness theory, perspectives about trust development, and perspectives about the development of tacit knowledge with the Uppsala theory and theories focusing on the rapid internationalization processes of SMEs, the dissertation show that personal interaction is important for the creation of trust and the reduction of uncertainties between firms and their foreign business partners. The creation of trust and the reduction of uncertainties in turn influence the development of experiential knowledge and, thus, the internationalization of SMEs. These results contribute to the Uppsala theory and the theories about the rapid internationalization processes of SMEs by showing that personal interaction between an SME and its foreign customers is an important consideration when investigating these firms' experiential knowledge development and internationalization.

By showing that a high quality and quantity of interaction in business relationships influence the experiential knowledge development and internationalization of SMEs, this dissertation also makes a contribution to interaction-oriented research on internationalizing SMEs. The investigation of which levels of qualitative and quantitative interaction firms use in their interaction with foreign business partners is particularly important to include in studies that investigate increased internationalization by exploring the co-development of new technology or new products by SMEs and their foreign business partners.

Concluding Remarks

This dissertation has highlighted various discrepancies that exist between the Uppsala theory and other theories that focus on the rapid internationalization of SMEs. Studying these discrepancies has revealed gaps in the research concerning the internationalization of SMEs. The aim of this dissertation was to fill in these research gaps, thereby, enhancing our understanding about how

SMEs develop experiential knowledge and internationalize. The dissertation has told the story of how different key employees in the investigated firms have used their previously developed human capital to decide which means of interaction to apply in foreign business relationships. The differences in the backgrounds of key employees influenced which means of interaction they chose, thus leading to differences in experiential knowledge development and internationalization among the investigated firms.

The finding in which different groups of SMEs internationalize in different ways is supported by neither the internationalization behavior presented in the Uppsala theory nor the behavior discussed in theories about the rapid internationalization of SMEs. The thesis thus contributes to the development of both the Uppsala theory and the theory about the rapid internationalization of SMEs by showing that there exist different sub-groups within born global SMEs that demonstrate different internationalization behaviors based on the human capital of the firms' key employees. By investigating the firms from a heterogenous perspective, we can, moreover, conclude that although the human capital of key employees differs among firms, the results do not suggest that a lack of international knowledge would hinder the rapid internationalization of these firms, which is indicated in previous studies of born globals. Hence, even though firms that employ key employees with high levels of international knowledge more often use high-commitment internationalization modes that enable a high quality and quantity of interaction with foreign customers, they are not required for a rapid internationalization. Firms that use low-commitment internationalization modes to interact in foreign business relationships can rapidly internationalize as well. However, their interaction in foreign business relationships will most likely be of a lower quality and quantity, which will affect their experiential knowledge development and continued internationalization negatively.

The results also show that key employees' interaction in both personal and business networks can help firms to learn about new foreign market opportunities and provide access to important foreign business relationships. Even though the access to personal and business networks differ between different groups of firms, the results indicate that successful internationalization does not solely depend on the kind of network relationships that a firm possess, but rather on the knowledge of how and when to interact with different kinds of network relationships. Moreover, key employees that provide important access to new business opportunities with foreign business counterparts can be acquired through grafting.

In contrast to previous studies that regard the use of ICT tools as a particularly important explanatory factor behind the success of internationalizing SMEs, the results of this dissertation show that personal interaction is also vital. Even though the use of ICT tools certainly may offer efficient and cost-effective opportunities for resource-constrained SMEs to use when searching for information and interacting with foreign customers, such tools cannot always act as a substitute for personal interaction. On the basis of the results generated, the view that rapidly internationalizing firms can rely

solely on ICT tools to further their internationalization, is questioned. Instead, the results suggest that even resource-constrained SMEs frequently interact with important business counterparts on a personal level. The means of interaction associated with personal interaction are especially important for firms that are dependent on the development of new products or new technologies together with foreign customers to survive. Personal interaction reduces uncertainties and supports the development of trust and experiential knowledge that are needed when participating in innovative activities with foreign business counterparts. These results further indicate that personal interaction can be considered important for the increased commitment of resources to foreign markets.

Previous research has called for the performance of multiple method studies that could provide a more in-depth picture of the phenomenon of SME internationalization (Coviello & McAuley, 1999). Arguments have even been made that the introduction of both quantitative and qualitative studies is required in SME research to allow more holistic and realistic conclusions to be drawn (Chaston et al., 1999). This dissertation answers this call for research because it is based on the results of both qualitative and quantitative studies. This triangulation of methods has, moreover, been particularly useful for verifying the relationships that exist among interaction, experiential knowledge development, and internationalization in SMEs.

Managerial Implications

In many branches of trade, domestic markets are becoming too small to support much growth for SMEs, and effective internationalization has therefore become a practical concern (Reuber & Fischer, 1997). In fact, as many as 96 percent to 99 percent of the total number of enterprises in the Organization for Economic Cooperation and Development (OECD) economies are SMEs (OECD, 2002), and these firms are continuously becoming more international. About one fifth of manufacturing SMEs in OECD countries draw between 24 percent and 32 percent of their turnover from cross-border activities. SMEs, moreover, contribute between 25 percent and 35 percent of the world's manufactured exports. The growing group of internationalizing SMEs has the potential to contribute substantially to the economic development of all countries. Many firms, however, find it difficult to achieve international expansion even though a successful internationalization could be decisive for them. If government institutes and trade organizations are to succeed in supporting these firms' international growth, they must first understand the problems that SMEs need to solve so as to internationalize successfully. Therefore, this dissertation describes some of the challenges and problems that these firms face in their internationalization.

The results of the dissertation show that firms that operate in dynamic markets and are subject to frequent market changes need to adapt rapidly to new conditions and opportunities. Hence, the development of experiential knowledge about certain international markets is important for

successful internationalization to occur. The previous knowledge of key employees can influence the way in which the firms will react to emerging opportunities. Employees with a vast amount of experience from operating in international markets are more likely to make decisions similar to those that have proven successful in the past, whereas employees with limited experience of operating in foreign markets may be more open to discovering unexpected opportunities. The results of the dissertation indicate that firms possessing both experience and the ability to adapt rapidly to new conditions and opportunities succeed with their internationalization. To achieve a successful internationalization, a firm might employ staff members with a variety of experiences with internationalization processes. A good balance can be achieved by matching the existing employees with new ones who possess the kind of knowledge and access to network connections that the firm lacks. When grafting, however, firms must be careful that they do not start focusing solely on the grafted employees' human capital rather than the firms' own so that the possibilities for implementing newly acquired experiential knowledge from failed internationalization strategies are not neglected.

Another important result of this dissertation is that the use of foreign network relationships is highly important for the internationalization of SMEs. For small firms, these relationships often consist of the previously established personal networks of the staff. Investigating the backgrounds of potential employees and evaluating the potential business that new employees can bring to the firm are aspects in grafting. In addition to providing important information (for example, who to contact in potential customer companies and what price to ask of potential customers), interaction in foreign network relationships can also lead to co-development of new technologies or new products.

Although the results of the dissertation indicate that personal interaction is not vital for firms that sell more standardized products to foreign customers, the personal aspect of interaction is important for firms faced with conducting complex tasks in business relationships. Firms that build their business on the ability to partake in successful innovation activities, such as new technological development or new product development, together with foreign business relationships should, therefore, allocate resources to personal interaction. Although experiential knowledge development is often regarded as giving companies a competitive edge, investments in new technology or product development are not necessarily profitable. Personal interaction with foreign business relationships is also a costly type of interaction. Successful managers should thus be careful in deciding when personal interaction (particularly in the form of face-to-face meetings) is necessary. Before embarking on each journey to meet with a party in a foreign business relationship, managers should ask themselves many questions, including the following:

1. Am I making this journey only to strengthen the business relationship, or can I expect something more?

2. Is it possible to combine our knowledge with their knowledge to achieve output in the form of new technologies or products?
3. Will this output lead to increased profits for us?
4. Can we use what we develop in other business relationships, or will it be tied to this particular customer or market?

These and similar questions can be asked by employees when deciding whether to invest in personal interaction in particular business relationships or whether these relationships are best managed via more cost-effective means of interaction, such as e-mail.

It is also important for managers of internationalizing SMEs to keep themselves up-to-date about developments in the means of interaction. Although traveling to meet with parties in foreign business relationships is a large expense for many internationalizing SMEs, it is still a common way to interact. Increased environmentalism and falling incomes in the wake of the global financial crisis could, however, rapidly change this. According to IT analytics at Gartner, videoconferences and new telepresence solutions are expected to replace 2.1 million airplane seats in 2009 (Waymaker, 090211). Even though it is still mostly larger firms that can afford to invest in the latest technologies for distance meetings, prices are continuously being reduced and the interaction technologies are continuously being improved. Therefore, it is not unreasonable to think that internationalizing SMEs will also increase their use of telepresence solutions in the future.

Although new telepresence solutions may provide better alternatives to personal interaction in the future, they would have to be drastically improved to replace the benefits gained from face-to-face interaction completely. Therefore, venture capital investors, governmental institutes, and trade organizations must acknowledge the need for SMEs to invest in personal interaction activities. If these actors want to be properly equipped to support the internationalization of SMEs, they first have to understand the challenges involved with participating in innovation activities together with foreign business relationships.

Policy makers, as well as researchers, frequently regard internationalizing SMEs (in particular rapidly internationalizing born global SMEs) as a homogenous group of firms that face the same type of internationalization problems. The results of this dissertation highlight the need to view these kinds of firms from a heterogenous perspective. The differing experiential knowledge of these firms, as well as the differences in their outlooks and needs, requires individual assessment. Because different firms have different needs, they should also be supported in different ways. Assessing the backgrounds of key employees may be useful in evaluating a firm's need of experiential knowledge to support its further internationalization.

Future Research

In light of the increasingly important role that internationalizing SMEs play in the world economy, interest in these types of firms has increased among governments, policy makers, and researchers. Even though Sweden is a small country, it has a large knowledge base, and technology and knowledge are frequently created as a result of interactions among companies, institutes, and universities (OECD, 2002). Because Sweden offers such a suitable business climate for the emergence of internationalizing SMEs, future research projects should also endeavor to contribute both practically and theoretically to the understanding of these firms and their internationalization.

A limitation of the qualitative study in this dissertation is that its narrow scope—focused on 14 biotech SMEs in one country—does not permit broad generalizations to be made. In comparison to the qualitative sample, the quantitative data sample is larger, consisting of data collected from 188 Swedish SMEs. Future research focusing on larger and broader samples of internationalizing firms is, however, recommended to validate further the results generated from the studies presented in the dissertation.

The results of the dissertation show that experiential knowledge is developed during firms' interactions in foreign business relationships and that this knowledge influences the internationalization of the firms. Experiential knowledge development is here regarded as generally positive and useful for the investigated firms. These results support previous research showing that knowledge gained from prior experiences constitutes important lessons for the firm's further international expansion (Blomstermo & Sharma, 2003; Johanson & Vahlne, 2003). For example, experiential knowledge can be used to identify mistakes that have been made in the past and to take action so as to correct these mistakes (Blomstermo et al., 2004). Other studies have, however, shown that to survive, organizations must also be able to unlearn. Before organizations try new ideas, they must unlearn old ones by discovering their inadequacies and then discarding them (Nystrom & Starbuck, 1984). More in-depth research about the experiential knowledge development of firms is necessary to investigate whether there is a particular kind of experiential knowledge that leads to a more successful internationalization.

One aspect to follow up in future research concerns how interaction and experiential knowledge development have an impact on the financial performance of internationalizing SMEs. Such an investigation would, however, have to include numerous control variables to check for factors that could affect the results. The results of this dissertation show that different means of interaction influence how SMEs develop experiential knowledge and internationalize. Future studies investigating how differences in the means of interaction affect the performance of internationalizing SMEs would be of great interest.

By showing that personal interaction still plays, and will probably continue to play, an important role for SMEs faced with complex tasks in foreign business relationships, this dissertation points to a need for future research about these firms so as to measure the effects of personal interaction

on international success. It would also be interesting to see what effects improved telepresence solutions will have on the perceived necessity for personal interaction for internationalizing SMEs.

From a managerial perspective, additional studies about the experiential knowledge development and performance of internationalizing SMEs could lead to results that would help these firms overcome the challenges of internationalization and prevent them from making the mistakes already made by other firms. These studies could, for example, reveal information about the different actions that SMEs have chosen to take in their internationalization and the resulting long-term consequences. In this way, a future research project could provide continuous support to the development of internationalizing SMEs in Sweden.

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Appendix 1

Survey – Internationalisation in Business Networks

Businesses often think of entering an international market as difficult. Problems concerning differing rules, the ability to evaluate other companies and cultural differences can become insurmountable obstacles. The ability to utilise knowledge based on previous experiences and to harness the company's network of various business contacts to increase knowledge has often proved key in success abroad. Nevertheless, few studies have been carried out into how companies acquire, transfer and harness knowledge in international business networks. We would therefore like to examine how the content of various business contacts and new advances in IT affect companies' ability to acquire, transfer and harness knowledge, and how this in turn influences companies' development. We need your help to be able to answer these questions and would therefore like to ask you to please complete this survey.

The results will be used for education, publications in international journals, books on internationalisation in networks and further dissemination to you, the practitioners with international operations. Preliminary results can be viewed on our website: www.hhs.se/inet. We will also arrange a conference for those who complete the survey. The conference will be held at the Stockholm School of Economics in 2009 where we will be presenting the results and holding workshops based on different industrial sectors. The survey is being sent to small and medium-sized enterprises with significant international operations. It is important that you complete the whole survey to enable us to carry out meaningful analyses of the material. **All answers will be treated in confidence.** If you have any questions, please contact Jukka Hohenthal or Emilia Rovira.

Dr. Jukka Hohenthal
Uppsala University
Tel. +46 (0)18-4711519
jukka.hohenthal@fek.uu.se

Doctoral candidate Emilia Rovira
Stockholm School of Economics
Tel: +46 (0)8-7369537
emilia.rovira@hhs.se

Dr. D. Deo Sharma
Professor
SSE

Dr. Angelika Lindstrand
Assistant Professor
SSE

Dr. Kent Eriksson
Professor
RIT

Your name and position in the company (job title)

Name _____

Job title _____

Are you interested in taking part in a conference on these issues Yes No

The survey consists of three parts. In Section A we would like you to provide general information about your company. In Section B we would like you to choose and answer questions about a specific international business contact. In Section C we would like you to answer questions about the players related to the chosen international business contact.

A. GENERAL

How many patents does your company have? _____
 How many new products/services have you launched in the past year? _____
 How many new customers have you sold to in the past year? _____
 How many new suppliers have you bought from in the past year? _____
 In which year did you have your first foreign sale? _____
 What percentage of the company's sales do the five largest customers account for:

 What percentage of the company's purchases do the five largest suppliers account for: _____

	Not at all				Completely		
We depend on our five largest suppliers for our product/service development	1	2	3	4	5	6	7
We depend on our five largest customers for our product/service development	1	2	3	4	5	6	7
Our customers depend on us for their product/service development	1	2	3	4	5	6	7
Our suppliers depend on us for their product/service development	1	2	3	4	5	6	7

We reach our customers abroad through (tick the options you use):

- Direct export
- Agent
- Distributor
- Wholly-owned subsidiary
- Majority-owned subsidiary
- 50/50-owned subsidiary
- Minority-owned subsidiary
- Alliance/Business partner

What percentage of your sales are abroad _____ %

B. A SPECIFIC INTERNATIONAL BUSINESS CONTACT

Please choose an international business contact. The business contact must have resulted in actual business being done. Examples of business contacts could be:

- Dealings with a distributor or another intermediary in another country
- Dealings with a customer in another country

Choose a business contact that is important to your company. Please answer the following questions about the business contact:

What type of product/service is the business contact connected with?

What is the service/product ratio of the business contact?

0-20% service 21-40% 41-60% 61-80% 81-100%

In which year was the business contact initiated? _____

Who initiated the communication?

Customer You Third party in host country Swedish third party Third party in another country

How or who is the business contact handled by?

Direct export

Agent

Distributor

Wholly-owned subsidiary

Majority-owned subsidiary

50/50-owned subsidiary

Minority-owned subsidiary

Alliance/Business partner

What is the foreign country? _____

How long have you had operations in the country? _____ years

What percentage of your sales does this market account for? _____ %

Have you developed or established new business relations by meeting people at the customer company in your spare time? Yes No

		Not at all	Completely					
Has the business contact resulted in new:	-products	1	2	3	4	5	6	7
	-techniques/technology	1	2	3	4	5	6	7
	-procedures	1	2	3	4	5	6	7
	-personnel	1	2	3	4	5	6	7
How important is the business contact to your company as regards	-knowledge	1	2	3	4	5	6	7
	-revenue	1	2	3	4	5	6	7

		Not at all				Completely		
The following factors have been obstacles in the relationship with the business contact:	-language	1	2	3	4	5	6	7
	-business culture	1	2	3	4	5	6	7
	-legislation	1	2	3	4	5	6	7
	-authorities	1	2	3	4	5	6	7

		Not at all				Completely		
The relationship with the business partner is characterised by:	-investments specific to this business partner	1	2	3	4	5	6	7
	-frequent exchange of information	1	2	3	4	5	6	7
	-the partner fulfilling its obligations to you	1	2	3	4	5	6	7
	-mutual adaptations	1	2	3	4	5	6	7
	-mutual investments	1	2	3	4	5	6	7
	-innovative knowledge development	1	2	3	4	5	6	7
	-innovative product development	1	2	3	4	5	6	7
	-general exchange of knowledge	1	2	3	4	5	6	7
The business partner is:	-joint problem-solving	1	2	3	4	5	6	7
	-easy to replace	1	2	3	4	5	6	7
	-important as a reference customer	1	2	3	4	5	6	7
	-a source of knowledge	1	2	3	4	5	6	7
	-a source of innovations	1	2	3	4	5	6	7
	-a source of capital	1	2	3	4	5	6	7

		Not at all				Completely		
In the business relationship, how familiar is the business partner's:	-product	1	2	3	4	5	6	7
	-production process	1	2	3	4	5	6	7
	-service content	1	2	3	4	5	6	7
	-distribution method	1	2	3	4	5	6	7
	-knowledge	1	2	3	4	5	6	7
	-competence	1	2	3	4	5	6	7
	-method of solving problems	1	2	3	4	5	6	7
How does the business contact differ from the company's other contacts as regards:	-product	1	2	3	4	5	6	7
	-production process	1	2	3	4	5	6	7
	-service content	1	2	3	4	5	6	7
	-distribution method	1	2	3	4	5	6	7
We have invested in the relationship in the form of:	-time	1	2	3	4	5	6	7
	-adaptations	1	2	3	4	5	6	7
	-capital	1	2	3	4	5	6	7
	-personnel	1	2	3	4	5	6	7

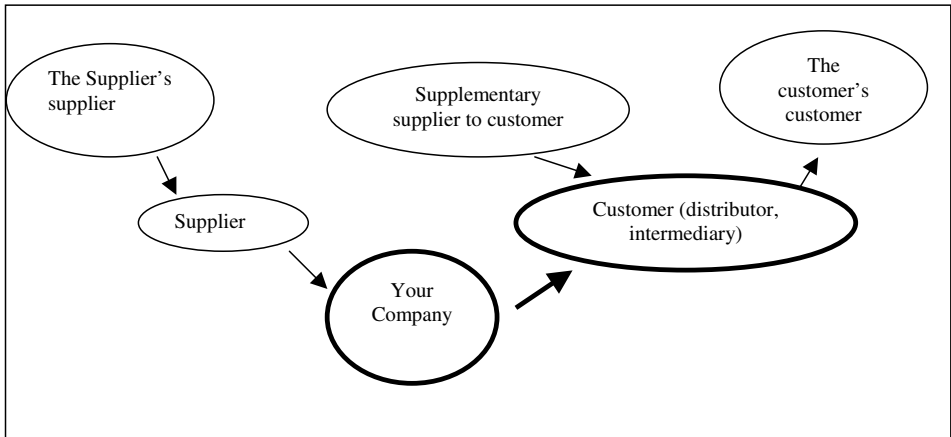
		Not at all				Completely		
The product/service you sell is:	-imitable	1	2	3	4	5	6	7
	-adaptable	1	2	3	4	5	6	7
	-well-documented	1	2	3	4	5	6	7

		Not at all				Completely		
What sources of information were important in establishing the business contact?	-customers	1	2	3	4	5	6	7
	-suppliers	1	2	3	4	5	6	7
	-consultants	1	2	3	4	5	6	7
	-competitors	1	2	3	4	5	6	7
	-authorities	1	2	3	4	5	6	7
	-banks	1	2	3	4	5	6	7
	-databases	1	2	3	4	5	6	7
	-newspapers/magazines	1	2	3	4	5	6	7

How many times does your company have contact with this company via:	Daily	A week		A month		A quarter		No contact
		1	Several	1	Several	1	Several	
-personal meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-e-mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-intranet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-video conferencing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

C. PLAYERS RELATED TO YOUR BUSINESS CONTACT IN THE BUSINESS NETWORK

Companies do not operate in isolation, instead they often have several related players, such as customers and suppliers, who they work with. A company and its related players can be said to be linked to each other in a business network. The diagram below shows an example of such a business network.



In this survey you are defined as the Company, the Supplier as your supplier of products/services and the Supplier's supplier as your supplier's supplier. The customer can simply be a customer, a distributor or another intermediary. The customer's customer is this party's customer. The relationship between you and the customer is the business contact.

Supplementary supplier refers to a supplier that provides products/services that are essential for your customer to be able to use/refine your product/service.

We would now like you to answer the questions below bearing in mind the current players related to the chosen business contact.

We have divided these players into two categories: 1) players on the chosen business contact's market, i.e. local players 2) Swedish or international players from other markets than the chosen business contact's market.

(Later in the survey you will be asked about experiences of previous related players that have had an influence on the chosen business contact and if the business contact has led to new business relations.)

Current local players on the foreign market related to the business contact

If the question is not relevant to your company please tick Not at all.

Local customer's customer		Not at all				Completely			
On the foreign market, how dependent is the chosen business contact on your most important local customer's customer's	-product	1	2	3	4	5	6	7	
	-research and development	1	2	3	4	5	6	7	
	-willingness to collaborate	1	2	3	4	5	6	7	
	-willingness to adapt	1	2	3	4	5	6	7	
	-joint procedures	1	2	3	4	5	6	7	
	-knowledge	1	2	3	4	5	6	7	
	-modernity, original ideas, contribution to new business opportunities	1	2	3	4	5	6	7	
	-social relations	1	2	3	4	5	6	7	
How many times does your company have contact with this local customer's customer via:	Daily	A week		A month		A quarter		No contact	
		1	Several	1	Several	1	Several		
	-personal meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	-phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	-Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	-e-mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	-intranet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	-video conferencing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Local customer's supplier of supplementary products and services		Not at all				Completely			
On the foreign market, how dependent is the chosen business contact on your customer's most important local supplier of supplementary products and services as regards:	-product	1	2	3	4	5	6	7	
	-research and development	1	2	3	4	5	6	7	
	-willingness to collaborate	1	2	3	4	5	6	7	
	-willingness to adapt	1	2	3	4	5	6	7	
	-joint procedures	1	2	3	4	5	6	7	
	-knowledge	1	2	3	4	5	6	7	
	-modernity, original ideas, contribution to new business opportunities	1	2	3	4	5	6	7	
	-social relations	1	2	3	4	5	6	7	
How many times does your company have contact with this supplier of supplementary products and services via:	Daily	A week		A month		A quarter		No contact	
		1	Sever al	1	Sever al	1	Sever al		
-personal meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-e-mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-intranet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-video conferencing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Local supplier		Not at all				Completely			
On the foreign market, how dependent is the chosen business contact on your most important local supplier's	-product	1	2	3	4	5	6	7	
	-research and development	1	2	3	4	5	6	7	
	-willingness to collaborate	1	2	3	4	5	6	7	
	-willingness to adapt	1	2	3	4	5	6	7	
	-joint procedures	1	2	3	4	5	6	7	
	-knowledge	1	2	3	4	5	6	7	
	-modernity, original ideas, contribution to new business opportunities	1	2	3	4	5	6	7	
	-social relations	1	2	3	4	5	6	7	
How many times does your company have contact with this most important local supplier via:	Daily	A week		A month		A quarter		No contact	
		1	Sever al	1	Sever al	1	Sever al		
-personal meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-e-mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-intranet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-video conferencing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Local supplier's supplier				Not at all		Completely				
On the foreign market, how dependent is the chosen business contact on your most important local supplier's supplier's	-product			1	2	3	4	5	6	7
	-research and development			1	2	3	4	5	6	7
	-willingness to collaborate			1	2	3	4	5	6	7
	-willingness to adapt			1	2	3	4	5	6	7
	-joint procedures			1	2	3	4	5	6	7
	-knowledge			1	2	3	4	5	6	7
	-modernity, original ideas, contribution to new business opportunities			1	2	3	4	5	6	7
-social relations			1	2	3	4	5	6	7	
How many times does your company have contact with this most important local supplier's supplier via:	Daily	A week		A month		A quarter		No contact		
		1	Sever al	1	Sever al	1	Sever al			
-personal meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
-phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
-Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
-e-mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
-intranet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
-video conferencing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Local competitor				Not at all		Completely				
On the foreign market, how dependent is the chosen business contact on your most important local competitor's	-product			1	2	3	4	5	6	7
	-pricing policy			1	2	3	4	5	6	7
	-research and development			1	2	3	4	5	6	7
	-modernity, original ideas, contribution to new business opportunities			1	2	3	4	5	6	7
	-social relations			1	2	3	4	5	6	7
How many times does your company have contact with this local competitor via:	Daily	A week		A month		A quarter		No contact		
		1	Sever al	1	Sever al	1	Sever al			
-personal meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
-phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
-Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
-e-mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Local consultant, authority, etc.				Not at all		Completely				
On the foreign market, how dependent is the chosen business contact on your most important local consultant or authority etc. on the chosen foreign market	-consultant			1	2	3	4	5	6	7
	-authority			1	2	3	4	5	6	7
	-bank			1	2	3	4	5	6	7
	-industry organisations			1	2	3	4	5	6	7

Current Swedish and other international players related to the business contact

What group of players is the chosen business contact most dependent on? Tick **one** option:

Your Swedish related players

Your International related players (excluding the chosen market)

Please answer the following questions bearing in mind the option chosen above.

Customer		Not at all				Completely			
To what extent is the chosen business contact dependent on your most important (Swedish or international) customer's	-product	1	2	3	4	5	6	7	
	-research and development	1	2	3	4	5	6	7	
	-willingness to collaborate	1	2	3	4	5	6	7	
	-willingness to adapt	1	2	3	4	5	6	7	
	-joint procedures	1	2	3	4	5	6	7	
	-knowledge	1	2	3	4	5	6	7	
	-modernity, original ideas, contribution to new business opportunities	1	2	3	4	5	6	7	
-social relations	1	2	3	4	5	6	7		
How many times does your company have contact with this customer via:	Daily	A week		A month		A quarter		No contact	
		1	Sever al	1	Sever al	1	Sever al		
-personal meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-e-mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-intranet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-video conferencing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Customer's customer		Not at all				Completely			
To what extent is the chosen business contact dependent on your most important (Swedish or international) customer's customer's	-product	1	2	3	4	5	6	7	
	-research and development	1	2	3	4	5	6	7	
	-willingness to collaborate	1	2	3	4	5	6	7	
	-willingness to adapt	1	2	3	4	5	6	7	
	-joint procedures	1	2	3	4	5	6	7	
	-knowledge	1	2	3	4	5	6	7	
	-modernity, original ideas, contribution to new business opportunities	1	2	3	4	5	6	7	
	-social relations	1	2	3	4	5	6	7	

How many times does your company have contact with this customer's customer via:	Daily	A week		A month		A quarter		No contact
		1	Several	1	Several	1	Several	
-personal meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-e-mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-intranet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-video conferencing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Customer's supplier of supplementary products and services		Not at all		Completely				
To what extent is the chosen business contact dependent on your most important (Swedish or international) customer's supplier of supplementary products and services as regards:	-product	1	2	3	4	5	6	7
	-research and development	1	2	3	4	5	6	7
	-willingness to collaborate	1	2	3	4	5	6	7
	-willingness to adapt	1	2	3	4	5	6	7
	-joint procedures	1	2	3	4	5	6	7
	-knowledge	1	2	3	4	5	6	7
	-modernity, original ideas, contribution to new business opportunities	1	2	3	4	5	6	7
-social relations	1	2	3	4	5	6	7	
How many times does your company have contact with this customer's supplier of supplementary products and services via:	Daily	A week		A month		A quarter		No contact
		1	Several	1	Several	1	Several	
-personal meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-e-mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-intranet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-video conferencing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Supplier		Not at all		Completely				
To what extent is the chosen business contact dependent on your most important (Swedish or international) supplier's	-product	1	2	3	4	5	6	7
	-research and development	1	2	3	4	5	6	7
	-willingness to collaborate	1	2	3	4	5	6	7
	-willingness to adapt	1	2	3	4	5	6	7
	-joint procedures	1	2	3	4	5	6	7
	-knowledge	1	2	3	4	5	6	7
	-modernity, original ideas, contribution to new business opportunities	1	2	3	4	5	6	7

	-social relations				1	2	3	4	5	6	7
How many times does your company have contact with this supplier via:	Daily	A week		A month		A quarter		No contact			
		1	Sever al	1	Sever al	1	Sever al				
-personal meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-e-mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-intranet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-video conferencing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Supplier's supplier		Not at all		Completely						
To what extent is the chosen business contact dependent on your most important (Swedish or international) supplier's supplier's	-product	1	2	3	4	5	6	7		
	-research and development	1	2	3	4	5	6	7		
	-willingness to collaborate	1	2	3	4	5	6	7		
	-willingness to adapt	1	2	3	4	5	6	7		
	-joint procedures	1	2	3	4	5	6	7		
	-knowledge	1	2	3	4	5	6	7		
	-modernity, original ideas, contribution to new business opportunities	1	2	3	4	5	6	7		
-social relations		1	2	3	4	5	6	7		
How many times does your company have contact with this supplier's supplier via:	Daily	A week		A month		A quarter		No contact		
		1	Sever al	1	Sever al	1	Sever al			
-personal meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
-phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
-Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
-e-mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
-intranet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
-video conferencing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Competitor		Not at all		Completely						
To what extent is the chosen business contact dependent on your most important (Swedish or international) competitor's	-product	1	2	3	4	5	6	7		
	-pricing policy	1	2	3	4	5	6	7		
	-research and development	1	2	3	4	5	6	7		
	-modernity, original ideas, contribution to new business opportunities	1	2	3	4	5	6	7		
	-social relations	1	2	3	4	5	6	7		

How many times does your company have contact with this competitor via:	Daily	A week		A month		A quarter		No contact
		1	Several	1	Several	1	Several	
-personal meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-e-mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Consultant, authority, etc.		Not at all			Completely			
To what extent is the chosen business contact dependent on your most important (Swedish or international)	-consultant	1	2	3	4	5	6	7
	-authority	1	2	3	4	5	6	7
	-bank	1	2	3	4	5	6	7
	-industry organisations	1	2	3	4	5	6	7

YOUR PREVIOUS EXPERIENCES OF PLAYERS FROM THE LOCAL AND OTHER MARKETS

In this section of the survey, we would like you to answer questions about your **previous experiences of players on various markets (local, Swedish or international) which have had an influence on the chosen business contact.** In other words, experiences that already existed in the company when you entered into the chosen business contact. This could, for example, relate to experiences of working with a particular type of player on a certain market which led you to decide to work with similar players this time too in the chosen business contact. They could also be experiences that have led you to work in a completely different way.

Your previous experiences of players on the business contact's local market:

		Not at all			Completely			
To what extent is the chosen business contact dependent on your previous experiences of local customers'	-co-operation	1	2	3	4	5	6	7
	-adaptations	1	2	3	4	5	6	7
	-development of procedures	1	2	3	4	5	6	7
	-knowledge	1	2	3	4	5	6	7
	-modernity, original ideas, contribution to new business opportunities	1	2	3	4	5	6	7
To what extent is the chosen business contact dependent on your previous experiences of local customers' customers'	-co-operation	1	2	3	4	5	6	7
	-adaptations	1	2	3	4	5	6	7
	-development of procedures	1	2	3	4	5	6	7
	-knowledge	1	2	3	4	5	6	7
	-modernity, original ideas, contribution to new business opportunities	1	2	3	4	5	6	7
To what extent is the chosen business contact dependent on your previous experiences of local	-co-operation	1	2	3	4	5	6	7
	-adaptations	1	2	3	4	5	6	7
	-development of procedures	1	2	3	4	5	6	7
	-knowledge	1	2	3	4	5	6	7

customers' suppliers of supplementary products and services'	-modernity, original ideas, contribution to new business opportunities	1 2 3 4 5 6 7
To what extent is the chosen business contact dependent on your previous experiences of local suppliers'	-co-operation	1 2 3 4 5 6 7
	-adaptations	1 2 3 4 5 6 7
	-development of procedures	1 2 3 4 5 6 7
	-knowledge	1 2 3 4 5 6 7
	-modernity, original ideas, contribution to new business opportunities	1 2 3 4 5 6 7
To what extent is the chosen business contact dependent on your previous experiences of local suppliers' suppliers'	-co-operation	1 2 3 4 5 6 7
	-adaptations	1 2 3 4 5 6 7
	-development of procedures	1 2 3 4 5 6 7
	-knowledge	1 2 3 4 5 6 7
	-modernity, original ideas, contribution to new business opportunities	1 2 3 4 5 6 7

		Not at all	Completely
To what extent is the chosen business contact dependent on your previous experiences of local competitors'	-product	1 2 3 4 5 6 7	
	-pricing policy	1 2 3 4 5 6 7	
	-modernity, original ideas, contribution to new business opportunities	1 2 3 4 5 6 7	
To what extent is the chosen business contact dependent on your previous experiences of local	-consultants	1 2 3 4 5 6 7	
	-authorities	1 2 3 4 5 6 7	
	-banks	1 2 3 4 5 6 7	
	-industry organisations	1 2 3 4 5 6 7	

Your previous experiences of Swedish or international players:

With regard to previous experiences, what group of players is the chosen business contact most dependent on? Tick **one** option:

Your experiences of Swedish players

Your experiences of international players (excluding the chosen market)

Please answer the following questions bearing in mind the option chosen above.

		Not at all	Completely
To what extent is the chosen business contact dependent on your previous experiences of Swedish or international customers'	-co-operation	1 2 3 4 5 6 7	
	-adaptations	1 2 3 4 5 6 7	
	-development of procedures	1 2 3 4 5 6 7	
	-knowledge	1 2 3 4 5 6 7	
	-modernity, original ideas, contribution to new business opportunities	1 2 3 4 5 6 7	

To what extent is the chosen business contact dependent on your previous experiences of Swedish or international customers' customers'	-co-operation	1 2 3 4 5 6 7
	-adaptations	1 2 3 4 5 6 7
	-development of procedures	1 2 3 4 5 6 7
	-knowledge	1 2 3 4 5 6 7
	-modernity, original ideas, contribution to new business opportunities	1 2 3 4 5 6 7
To what extent is the chosen business contact dependent on your previous experiences of Swedish or international customers' suppliers of supplementary products and services'	-co-operation	1 2 3 4 5 6 7
	-adaptations	1 2 3 4 5 6 7
	-development of procedures	1 2 3 4 5 6 7
	-knowledge	1 2 3 4 5 6 7
	-modernity, original ideas, contribution to new business opportunities	1 2 3 4 5 6 7
To what extent is the chosen business contact dependent on your previous experiences of Swedish or international suppliers'	-co-operation	1 2 3 4 5 6 7
	-adaptations	1 2 3 4 5 6 7
	-development of procedures	1 2 3 4 5 6 7
	-knowledge	1 2 3 4 5 6 7
	-modernity, original ideas, contribution to new business opportunities	1 2 3 4 5 6 7

		Not at all	Completely
To what extent is the chosen business contact dependent on your previous experiences of Swedish or international suppliers' suppliers'	-co-operation	1 2 3 4 5 6 7	
	-adaptations	1 2 3 4 5 6 7	
	-development of procedures	1 2 3 4 5 6 7	
	-knowledge	1 2 3 4 5 6 7	
	-modernity, original ideas, contribution to new business opportunities	1 2 3 4 5 6 7	
To what extent is the chosen business contact dependent on your previous experiences of Swedish or international competitors'	-product	1 2 3 4 5 6 7	
	-pricing policy	1 2 3 4 5 6 7	
	-modernity, original ideas, contribution to new business opportunities	1 2 3 4 5 6 7	
To what extent is the chosen business contact dependent on your previous experiences of Swedish or international	-consultants	1 2 3 4 5 6 7	
	-authorities	1 2 3 4 5 6 7	
	-banks	1 2 3 4 5 6 7	
	-industry organisations	1 2 3 4 5 6 7	

NEW BUSINESS RELATIONS

Has the chosen business contact led to a business relation arising with

New international customers?

No Yes How many?.....

New local customers on the chosen market?

No Yes How many?.....

New international suppliers?

No Yes How many?.....

New local suppliers on the chosen market?

No Yes How many?.....

To what extent have you tried to create new business relations with the following in the business contact?

	Small				Large		
-New international customers	1	2	3	4	5	6	7
-New local customers on the chosen market	1	2	3	4	5	6	7
-New international suppliers	1	2	3	4	5	6	7
-New local suppliers on the chosen market	1	2	3	4	5	6	7

Paper 1

The value of human capital for the networks of born globals

Sara Melén and Emilia Rovira Nordman*

Published 2007 in: *International Journal of Globalisation and Small Business*,
2 (2), 205-219.

*The authors appear in alphabetical order and have equally contributed to this paper.

The value of human capital for the networks of born globals

Sara Melén and Emilia Rovira Nordman*

Department for Marketing and Strategy
Stockholm School of Economics
P.O. Box 6501, S-113 83 Stockholm, Sweden
Fax: +46 8 33 94 89
E-mail: sara.melen@hhs.se
E-mail: emilia.rovira@hhs.se
*Corresponding author

Abstract: This study explores how a born global firm uses its network to learn during its internationalisation and how human capital influences this learning process. Within born global research, there exists a discrepancy between scholars who regard personal networks to be the most important for born globals' international growth and those who regard business networks as the most important. Based on a longitudinal in-depth case study of a born global within the Swedish biotech industry, our results show that both forms of networks are important but that a born global firm's use of its network differs at various phases in the firm's internationalisation.

Keywords: born global; human capital; personal networks; business networks.

Reference to this paper should be made as follows: Melén, S. and Nordman, E.R. (2007) 'The value of human capital for the networks of born globals', *Int. J. Globalisation and Small Business*, Vol. 2, No. 2, pp.205–219.

Biographical notes: Sara Melén is currently undertaking a PhD in Marketing and International Business at the Stockholm School of Economics. Her fields of specialisation include born globals' internationalisation processes, born globals' learning processes and their use of social capital.

Emilia Rovira Nordman is currently undertaking a PhD in Marketing and International Business at the Stockholm School of Economics. Her fields of specialisation include the effects of personal interaction on the internationalisation processes of SMEs and the internationalisation of born globals in the biotech business.

The authors appear in alphabetical order and have contributed equally to this article.

1 Introduction

Small- and Medium-sized Enterprises (SMEs) play a crucial role in strengthening the growth and the financial performance of economies around the world. An increasing number of SMEs are, furthermore, shown to start operating in foreign markets from inception or soon thereafter. Scholars have referred to these firms as 'born globals'

(Knight and Cavusgil, 1996) or International New Ventures (INVs) (Oviatt and McDougall, 1994), and researchers as well as practitioners have recognised the need to improve our understanding of these firms' international growth patterns. In this study, we use the concept of born globals when referring to early and rapidly internationalising SMEs. Influenced by other scholars (Knight and Cavusgil, 1996; Autio *et al.*, 2000), we define a born global as a firm that, from inception, discovers and exploits opportunities in multiple countries.

Even though research during the past decade has contributed important explanations regarding the rapid internationalisation pattern of born globals, an aspect that still is largely overlooked is how the learning processes of these firms function. Learning how to conduct business in foreign markets and how to interact with customers in a specific market are key issues in firms' internationalisation processes, from both a theoretical (Johanson and Vahlne, 1990; Johanson and Vahlne, 2003) and a practical perspective. Commenting on the past decade's research on born globals, Zahra (2005) points out that "given the importance of learning for INVs' successful performance, it is essential to understand what and how these firms learn" (p.25). If born globals experience a more rapid internationalisation process, we have reason to expect that these firms' learning processes are different from those of other firms. The new patterns of internationalisation and learning call for us to rethink existing theories and models within the internationalisation process literature. This study endeavours to contribute to that effort through modifications of existing theories.

In this study, we rely on the existing behavioural internationalisation process theory and integrate this theoretical framework with the network theory and the human capital theory. We believe such a theoretical framework can contribute to the knowledge of how born globals learn during their internationalisation process. The more specific aim of this paper is to explore how a born global uses its network to learn during its internationalisation and how human capital influences this learning process. To investigate these questions, we conducted an in-depth, longitudinal case study of a born global active in the Swedish biotech industry. Since Sweden is a small country with a large knowledge base and where technology and knowledge frequently are created as a result of interaction between companies, institutes and universities (OECD, 2002), biotech born globals are relatively common.

2 Theoretical background

2.1 Learning according to the internationalisation process theory

Based on the behavioural internationalisation process theory, the internationalisation of firms is described as the process of accumulating knowledge of markets and institutions abroad by operating in these markets (Johanson and Vahlne, 1977; Johanson and Vahlne, 1990), thus gaining experiential knowledge. Experiential knowledge about foreign markets is identified as the most critical knowledge for the internationalising firm (Bilkey and Tesar, 1977; Johanson and Vahlne, 1977). Experiential knowledge may help an internationalising firm to identify mistakes that have been made and to take action to correct these mistakes (Blomstermo *et al.*, 2004). Firms' activities in markets and the strategic decisions taken are both the source and the result of experiential knowledge acquisitions, as firms continually apply lessons learned from experience to future activities and future strategic decision making.

The process of acquiring experiential knowledge starts at the individual level. The experiences that the individuals of a firm undergo are later stored in the organisation's routines and practices (Walsh and Ungson, 1991; Cohen and Bacdayan, 1994). The nature of experiential knowledge accumulation implies that it is similar to learning, as organisational learning is "the process within the organization by which knowledge about action-outcome relationships and the effect of the environment on these relationships is developed" (Duncan and Weiss, 1979, p.84).

2.2 *Born globals and human capital*

McDougall *et al.* (1994) argue that the existing theory fails to explain the formation of early and rapidly internationalising firms because it focuses on the firm-level analysis of large, mature firms. To understand the born global firm, it is necessary to focus on the individual and to determine who the founders of these firms are. McDougall *et al.* (1994) contributed to this discussion by demonstrating that the founders of these firms are entrepreneurs who possess an unusual constellation of competencies that they have developed from earlier activities, which enable these firms to be international from inception. Similar to McDougall *et al.* (1994), Madsen and Servais (1997) argue that to fully understand the phenomenon of born globals, we must examine the background of the founders of these firms, including their education, experience gained from living abroad, and experience attained from other internationally oriented jobs. Andersson and Wictor (2003) found that a majority of the entrepreneurs in the born globals they studied had an academic degree and that all entrepreneurs had extensive international experience that had been acquired in their earlier work experiences as well as in studies abroad. Studies have also shown that it is important for founders to have experience in the particular industry in which their new born globals will operate (Madsen and Servais, 1997; McDougall *et al.*, 2003).

In light of the findings presented in previous studies, we argue that the human capital of born globals is an important aspect to consider in understanding born globals' internationalisation. Human capital is a comprehensive concept that encompasses those intangible resources embodied in the skills and knowledge acquired by an individual (Coleman, 1988) and enables a person to act in new ways (Nahapiet and Ghoshal, 1998). Human capital is traditionally built up from components such as formal education and experience (Davidsson and Honig, 2003).

2.3 *The born globals' networks*

Born global studies have indicated that one means for a born global to manage a more rapid internationalisation process is to use the networks for accessing the resources needed (Coviello and Munro, 1997; Yli-Renko *et al.*, 2002). By integrating the behavioural internationalisation theory with the network theory, scholars have even described the internationalisation process of these firms to be a matter of learning through networks (Sharma and Blomstermo, 2003; Saarenketo *et al.*, 2004), which implies that firms' current activities in foreign markets occur via interactions with network relationships (Johanson and Vahlne, 1990).

Previous studies about born globals indicated that the personal networks that are developed by founders and managers prior to the start of the firm are important for the firm's rapid internationalisation (Madsen and Servais, 1997; Andersson and Wictor, 2003; Sharma and Blomstermo, 2003). McDougall *et al.* (1994) found that INVs were started by entrepreneurs who had developed a worldwide network, comprising highly successful individuals, from earlier activities. These networks were characterised by personal relationships, as opposed to business relationships. In addition to providing advice, these personal contacts often helped the newly started firm in identifying opportunities. Andersson and Wictor (2003) reported similar findings, and they also claimed that the majority of the literature concerning networks focuses on networking that occurs in more mature firms, as well as on the processes, routines and systems that are present at the company level. However, born globals often lack processes, routines and systems because of their newness. Therefore, to understand how born globals function, it seems more appropriate to focus on their personal networks. In contrast to these findings, Coviello (2006) found that economic relationships are the most instrumental in determining born globals' international growth, which was evident in the very early stages of the investigated firms' life cycles, as well as throughout the following stages of their international growth. Somewhat similar findings were also presented by Coviello and Munro in 1997, who found that the rapid internationalisation of newly started, small software firms was often initiated by their relationship with a large business partner.

We conclude that previous studies indicate that both personal and business networks are important in born globals. Our view is supported by Rialp *et al.* (2005), who concluded that the use of both personal and business networks engenders and facilitates early internationalisation among born global firms.

To analyse how born globals use their networks to learn during their internationalisation process, we distinguish between business and personal networks. We define personal networks as those consisting of network relationships that have been created by, and related to, entrepreneurs personally. Personal networks have been created by entrepreneurs at various stages of their careers and retained over the years (Hallén, 1992). In line with the business network approach (Johanson and Mattsson, 1988), we define business networks as those consisting of relationships with customers, distributors, suppliers, competitors and government. Business relationships are basically created by, and related to, the company of the person disposing of the contacts, and can be transferred to other individuals. In this study, we chose to focus on the customer relationships present in the business networks of born globals.

2.4 *Born globals, networks and grafting*

We acknowledge that studies have provided indications of the challenges that newly started, small high-tech firms have in terms of changing their networks during the internationalisation process (Jones, 1999). Crick and Spence (2005) demonstrated that in the early phase of small, high-tech firms' internationalisation, existing networks consisted of the previously developed relationships of owners and managers. These networks can, however, lose their usefulness in a certain phase of firms' internationalisation. To obtain access to critical resources and enter new markets, the firms in their study had to develop new networks. One means to do so was to recruit executives and new employees with the necessary experience and knowledge. These new recruitments also provided

firms with new network relationships that were considered useful. The Crick and Spence (2005) study indicates that grafting new members who possessed the needed knowledge helped manage the use of networks for resource access during born globals' internationalisation. Grafting can be a faster method of acquiring complex forms of knowledge compared with acquiring this knowledge through experience. Huber (1991, p.97) described learning through grafting as learning through acquiring and grafting of new members who possess knowledge not previously available within the organisation. With the exception of an article by Bengtsson (2004), few studies have to our knowledge focused on born globals' learning through grafting.

3 The exploratory study: research method

To explore how born globals use their networks to learn during their internationalisation and how human capital influences this learning process, we used a qualitative case-study approach. This type of approach is generally preferred when 'how' or 'why' questions are posed (Yin, 2003) and when the aim is to build new theory from data (Eisenhardt, 1989).

In this study, we focused on a company that is active in the Swedish biotech industry, a highly internationalised industry characterised by rapid change and growth. With 230 biotech firms, Sweden has the largest share of biotech companies per capita in the world (SwedenBIO, 2005), and most of these companies are small enterprises. We selected our case firm (which we will call Alpha for the purposes of this study) from 'The Swedish Biotech Industry Guide', a database that lists and offers information about Swedish biotech firms. Alpha was selected from a larger group of 14 firms in the biotech business that we have followed since 2003. We decided to conduct a single case study of Alpha because we wanted to perform an in-depth analysis of a typical case. A group analysis of the 14 biotech SMEs revealed that Alpha is a representative case to use when investigating born globals. According to Yin (2003), it is suitable to use a representative or typical case, chosen from a larger group of firms, when the objective is to capture the circumstances of an everyday or commonplace situation. The lessons learned from these single cases can, in this manner, be used to say something about the experiences of the average organisation in the same field.

To find suitable cases for our study, we chose to focus on the large biotech cluster in Uppsala. This concentration of a group of firms in a single location facilitated data collection by providing continuous access to the founders and managers within biotech SMEs. To be included in this study, potential case firms also had to have their founders still working at their firms, had to conduct their own research and development (R&D), and must have at least one product sold in a foreign (*i.e.*, non-Swedish) market. These criteria were chosen so that we could find internationally active firms capable of managing the production chain themselves: from R&D to the interaction with foreign actors. Because the founders of small entrepreneurial enterprises have often been shown to play important roles in the firms' first years of internationalisation, we also wanted the founders to be still active in the firms.

These criteria limited the number of potential cases dramatically. We chose to contact qualified candidate case firms randomly. We started out by contacting one firm by telephone and then gradually continued to add firms in the same manner. All of the firms that we subsequently contacted agreed to participate in the study.

Data collection was stopped after 14 companies had been visited. Because the interviews conducted at the last few firms provided us with narratives similar to those we had previously heard, the theoretical saturation point seemed to have been reached.

Table 1 describes Alpha in 2003 when the study was started. Table 1 also shows that Alpha fits into the commonly used operationalisation model that views born globals “as firms less than 20 years old that internationalized on average within three years of founding and generate at least 25 percent of total sales from abroad” (Knight *et al.*, 2004, p.649).

Table 1 Alpha in 2003, at the beginning of the study

Founding year	1998
Number of employees	29
Turnover (thousands of USD)	2012
Net profit/loss (thousands of USD)	-2725
Year of first foreign sale	1999
Export percentage (compared to total sales)	70% (within 6 years after foundation)
Foreign market entries since foundation (regions of the world)	Europe and North America
Internationalisation modes	Develops products in cooperation with customers in Finland, Norway, Great Britain, the USA and Germany

3.1 Data collection

In this study, we considered Alpha to be the unit of analysis. To investigate Alpha’s international development, we chose to conduct interviews with the founder as well as with the managers who had been most responsible for managing the firm’s internationalisation process. Between January 2003 and June 2005, we conducted face-to-face interviews with these employees at Alpha. We have, however, continued to follow the development of Alpha by collecting secondary data and by conducting brief phone interviews with some of the respondents. We decided to study Alpha in a longitudinal manner to determine how certain conditions changed over time. Eleven face-to-face, semistructured interviews were conducted with the Alpha staff. The interview times ranged from 40 to 160 min, with an average duration of around 120 min.

A major strength of a case-study data collection is the opportunity to use different sources of evidence (Creswell, 2003; Yin, 2003). Multiple sources of evidence are also particularly important in terms of strengthening the construct validity. In addition to conducting semistructured interviews with different employees, we used archival documentation from Alpha, as well as information about the firm collected from databases, such as articles and annual reports. We also established evidence chains and found that the documentary evidence corroborated the stories provided by the different employees. Another test was to receive feedback on drafts of the cases from the interviewees.

To strengthen the external validity of our case study, we followed an experiment-like replication logic when collecting the data (Yin, 2003). Even though our interviews were semistructured, the respondents were given the opportunity to speak freely and to elaborate on their answers. To ensure that the same topics were covered at all of the interviews, we utilised an interview guide.

To increase the reliability of the study, we kept a detailed account of our activities in a research protocol, which included transcripts of the audiotape recordings from all of the interviews, transcripts of our field notes and observations, and transcripts of the secondary data. Because the goal of reliability is to minimise errors and biases in a study, we, moreover, enlisted two researchers to conduct the interviews at the investigated firms.

3.2 Analytical approach

Alpha, the case firm under investigation in this study, is a typical Swedish born global. To investigate its internationalisation process, we chose to follow Alpha longitudinally during the years 2003–2007. In doing so, we aimed to explore how certain conditions in Alpha's environment changed over time and how these changes influenced Alpha's learning. To carry out our objective, we used chronology analysis, which is a special form of time-series analysis. Longitudinal case studies are particularly suitable for this kind of analysis because they allow one to trace events over time and explore the causal effects of these events (Yin, 2003). In our longitudinal study of Alpha, we chose to focus on three stages in Alpha's internationalisation: the international establishment phase between 1999 and 2002, the reorganisation phase between 2002 and 2003, and the new market phase from 2004 to the present.

4 The learning and internationalisation of Alpha

When this study was started in 2003, Alpha was a firm that specialised in manufacturing microcomponents in plastic. Microcomponents are traditionally made from silicon, a material that is much more expensive to utilise than plastic. Alpha is, furthermore, able to manufacture a plastic component in a fraction of the time that it takes to manufacture a similar microcomponent in the traditional way. Alpha's production technology, with a large series of products that can be manufactured cheaply, was believed from the beginning to be well suited for one-time products in biotechnology or electronics. Even though Alpha can manufacture large quantities of products, different product applications must be developed in close and long-term collaboration with the customers/end users before the manufacturing phase can begin.

4.1 The establishment phase

His (*i.e.*, the founder's) influence on our sales has been heavy. Hitherto, he has generated about 90 percent of our customers. (excerpt from an interview with Alpha's Market and Applications Director, 5 February 2003)

Alpha's Market and Applications (M&A) Director recognises the founder's ability to make potential customers enthusiastic about Alpha's products as one of his greatest strengths in generating new business. The founder started his career at a biotech company in the 1980s. At the beginning of the 1990s, he left this employment and started working at a large international pharmaceutical group instead. Around the turn of the millennium, he thought that the time was right to start the company Alpha, for which he and his boss from the large pharmaceutical group had already started to create a business plan in the mid-1990s.

From 1997 to 2002, Alpha's founder assumed the main responsibility of initiating customer relationships. Because the founder's network in the biotech industry was considerable, he was able to get in contact with the right individuals at potential customer companies. For example, when the founder became interested in a large Finnish company, he contacted individuals in his network to determine if any of them had any connections within the firm who might be interested in doing business with Alpha. From a mutual network connection, he received the names of two people who worked at the company.

From his previous places of employment, the founder had gained experience working with customers both in Germany and the USA. For example, the founder contacted one of his old American contacts for advice about how much the company could ask a new American customer to pay for an offer that Alpha was planning to submit. The American contact and the founder talked about the value for the customer and the cost for Alpha and decided on something that ought to be a good deal for both of them. As a result, the price quotation was twice as much as it would have been without the discussion. The deal was accepted, and both parties were satisfied.

4.1.1 Analysis of the establishment phase

This case study demonstrates that the founder had a great impact on Alpha's early internationalisation in the establishment phase. From previous job positions, the founder had attained experience with the biotech industry, experience with the technology upon which Alpha is built, and experience from working abroad. We define the founder's experiences and knowledge, acquired from previous job positions, as his human capital. The founder's human capital influences what new knowledge Alpha acquires and his personal network provides him with access to important knowledge that would be hard for him to obtain in any other way. In the establishment phase, Alpha's network was mostly made up of the personal network that the founder had developed during previous job positions. The business network was still under development, and limited significant learning from the business network occurred during this early phase of internationalisation. Learning through grafting was also limited because Alpha's staff members believe that the necessary experiential knowledge about international sales is incorporated in the founder and his personal network.

4.2 The reorganisation phase

The staff that previously had worked as project leaders came to take the role as account managers after the reorganisation [...] All of the account managers are very knowledgeable about technology, and many of us are PhDs. (excerpt from an interview with one of Alpha's account managers, 8 April 2003)

Five years after Alpha's foundation, the company was divided into two departments, the Technology Department and the M&A Department. Apart from an M&A Director, Alpha's new M&A Department consisted of six account managers who managed the main relationships with existing customers and also worked to generate new customers for the company. One of the major reasons for Alpha's reorganisation in 2003 was the need to enter new markets. By this point, Alpha had emptied out the customers that had been generated from the best personal-network connections of the founder. Instead, the strategic plan was to turn to new customers that were larger than Alpha in new foreign markets.

At the time of the reorganisation, Alpha had also noticed that it needed to improve its customers' rate of repeat orders. During the fall of 2002, Alpha performed a customer analysis, which revealed that Alpha had conducted business with approximately 30 customers within the biotech industry since its inception. Only a few of these customers, however, had turned to Alpha for new projects. One of the explanations for the low ratio of repeat orders was that some of Alpha's customers had gone bankrupt as a consequence of the recession, and for many of the others, times were also hard.

Some of the new account managers acknowledged that they did not have much experience with international sales in comparison with the founder. Furthermore, they did not have the same extensive technological knowledge that the founder possessed. The three account managers all agreed that it was important to possess technical knowledge in order to sell Alpha's products. They did, however, also relate that Alpha's focus on technical selling could be one of the reasons why the company had had problems with initiating business relationships at the right level in potential customers' organisations. The account managers succeeded at awakening the interest of the technical personnel, but failed to reach the economic decision-makers who had the power to make purchasing decisions. At Alpha, it was still the founder who had the most extensive experience in sales and, thus, the broadest knowledge of how to advance to other levels than the purely technical in a potential customer's organisation.

The reorganisation of Alpha took a long time to implement, and in the winter of 2003, the M&A Director related that the company had to start rethinking its new strategy if sales did not increase rapidly during the spring.

4.2.1 Analysis of the reorganisation phase

In the early phase of Alpha's internationalisation, the firm's operations were dominated by the influence of the founder's human capital and personal networks. The decision to reorganise the firm was a result of what Alpha's staff had learned from their interactions with existing customers. During the reorganisation phase, the six account managers started assuming responsibility for initiating and managing Alpha's customer relationships, which implies that Alpha's internationalisation was now influenced more by the six account managers' human capital and personal networks than by the founder's. Alpha's new M&A Department could be viewed as a result of an internal grafting process because Alpha was now utilising the human capital and personal networks of the account managers in a new way. However, the result of the internal grafting did not live up to the expectations. In comparison with the founder, the account managers' human capital was limited and this influenced their ability to initiate relationships with potential customers and build a strong business network. The account managers' tasks were also made more difficult because of the downturn in the economy.

4.3 *The new market phase*

We were not that interested to change because biotechnology was still going so well [...] Before 2002, we had not lost a single submitted offer, but from the year 2002, it was the other way around. (excerpt from an interview with Alpha's founder, June 28, 2005)

The difficult times that Alpha's old customers in the biotech industry had experienced during the recession also forced Alpha to downsize its organisation. When we visited Alpha in the beginning of 2004, only two account managers and the M&A Director remained of the old M&A Department. One of the remaining account managers said that they had actively worked to generate new customers during the past year. Connections with between 75 and 100 companies had been generated, and eventually, these relationships became too much for the account managers to handle. Because of time limitations, they never had the chance to work closely with these companies and analyse their situation thoroughly. In December 2003, the strategy was changed. Instead of trying to sell shorter development phases to a larger number of companies, Alpha would try to initiate longer cooperations with a smaller number of large customers.

Aside from these changes, Alpha's venture capital investors had helped the company to headhunt for an external Chief Executive Officer (CEO), who started working for Alpha at the beginning of 2004. Alpha's new CEO had a background in the diagnostics business, where he had many years of experience working as a sales manager at a multinational company. The new CEO was, furthermore, the first person at Alpha with experience in pure selling functions. The employment of the CEO was also the factor that influenced Alpha's strategic change because he pressed vigorously for this change in strategic orientation.

Before the new CEO started, Alpha's staff did not know much about the market for diagnostics. They had previously been discouraged by the fact that diagnostics was such an inexpensive business. Because every unit is rather cheap, many units have to be produced to generate a profit. Alpha's previous plan had always been to produce expensive units, but this strategy proved to be ineffective. Much of the blame for the ineffectiveness of the previous plan could be attributed to the market failure of many of Alpha's small customers. These firms did not grow at the anticipated rate, and the biotech industry had suffered a downturn worldwide during the past couple of years. However, the founder also acknowledged that Alpha had not done its homework in marketing properly; diagnostics was an important market that had been previously overlooked. In comparison to small biotech firms, it is easier to work with large diagnostic customers because they are all listed on the stock market, and it is easy to attain information about them. To initiate the customer relationships that Alpha now seeks, the company utilises consultants. These consultants help Alpha to get in contact with individuals at high levels in important customer companies and make it possible for Alpha to present its ideas to these individuals.

In 2006, Alpha found success with the development of a quick test for cardiac disease and signed collaborator agreements with several international diagnostic companies. The international launching of Alpha's own diagnostic product will start in 2008, and the firm expects large new investments from the venture capitalists to support the international marketing activities. Alpha has already hired about ten more employees and expects to have a staff of 50 by the end of 2007.

4.3.1 Analysis of the new market phase

The new market phase is characterised by an effort to correct the problems and errors that were identified when dealing with Alpha's existing small, knowledge-intensive customers. Two international consultants provided useful knowledge that helped the employees to come into contact with important companies that were outside Alpha's existing business network. By using grafting to acquire new knowledge and obtain access to new personal and business networks, Alpha's staff members were able to steer the firm's internationalisation in a direction that otherwise would have been impossible because of the firm's lack of knowledge about the diagnostics business. By grafting a new CEO, Alpha also acquired new human capital that came to influence Alpha's internationalisation extensively. Alpha's ability to initiate customer relationships with large diagnostics companies was greatly influenced by the sales experience of the new CEO in the diagnostics business. Table 2 summarises the results of the analysis.

Table 2 Learning in the internationalisation of Alpha

<i>Alpha's development</i>	<i>Main source of human capital</i>	<i>Personal networks</i>	<i>Business networks</i>	<i>Grafting</i>
Establishment phase	The founder	The founder's personal network is used to learn about business opportunities.	Alpha builds up a business network.	Limited
Reorganisation phase	The account managers	The account managers use their personal networks to initiate new business.	Alpha learns that their customers do not generate enough business.	Internal grafting of the account manager
New market phase	The CEO	The CEO uses his personal network to access knowledge of the diagnostics market.	Alpha extends its business network.	External grafting of a new CEO and two consultants

5 Discussion

The purpose of this study was to explore how a born global uses its network to learn during its internationalisation and how human capital influences this learning process. The case study demonstrates that the personal networks of founders and managers often are used to provide born globals with important knowledge, for example, concerning whom to contact in potential customer companies and what price to ask potential customers for. The findings, moreover, contribute to existing research by claiming that the human capital of employees influences born global firms' initial learning processes. It is the human capital that decides what relations a born global uses in its early internationalisation, which in turn may influence the strategic direction of the whole firm. We thus conclude that the human capital in the born global firms will influence the network learning of the firms by affecting the conditions in which learning occurs. This implies that the human capital influences with whom and where interactions and learning take place. To determine the role that human capital plays in born globals' learning,

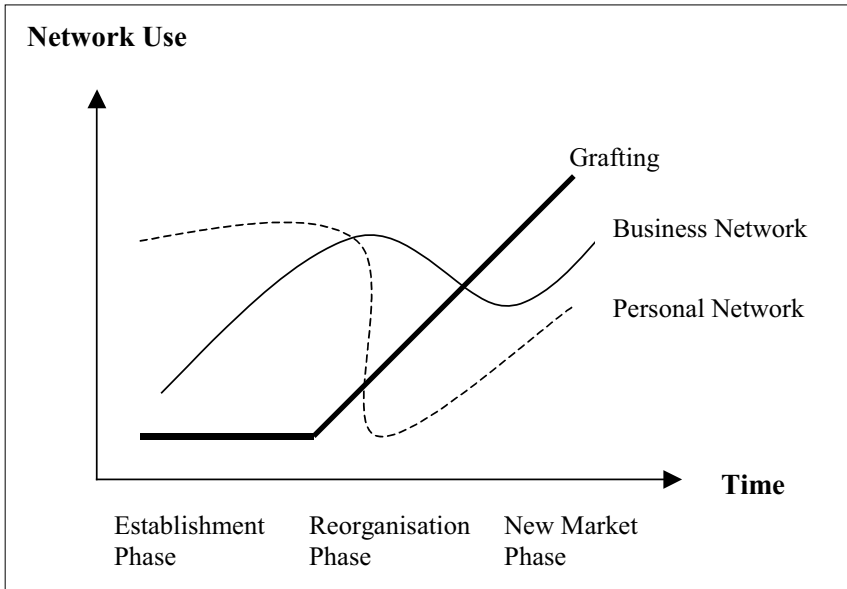
it is, moreover, necessary to extend these studies to the time prior to the born globals' establishment because the human capital often has been developed from an entrepreneur's previous employment and life experiences. Several studies have already emphasised the need to study a born global firm prior to its inception in order to fully understand its internationalisation (Madsen and Servais, 1997; Coviello, 2006). More specifically, studies have called for more born global research investigating the background of the founder (Madsen and Servais, 1997). This study contributes with interesting findings regarding the role of a founder's human capital in the born global firm's learning in its internationalisation. We specifically show that the learning process of a born global firm does not start at the firm's inception but rather at the phase prior to its establishment.

In accordance with Coviello (2006), we acknowledge the importance of considering the network dynamics in a born global's internationalisation process. Within the field of born global research, some scholars have, however, emphasised that it is the personal networks that are the most important for born globals (Andersson and Wictor, 2003), whereas other scholars have claimed that it is the business relationships that are the most important for these firms' international growth (Coviello, 2006). We argue that a born global firm's use of its networks differs at various phases in the firm's internationalisation. To summarise the findings made in the analysis of Alpha, Figure 1 presents a theoretical model showing how the use of networks for acquiring knowledge is changed during a born global's internationalisation. In Alpha's establishment phase, the founder's personal network was used to acquire knowledge of potential foreign-customer relationships, whereas the business network, including foreign-customer relationships, was still under development. Alpha's internationalisation was thus more characterised by learning from personal-network relationships than learning from business-network relationships in this phase. This situation, however, changed when Alpha entered its reorganisation phase, and the founder's personal network no longer could provide the firm with the knowledge needed for initiating new foreign-customer relationships. Alpha also experienced cash flow problems. The learning generated from the use of personal networks and how this influenced Alpha's business network resulted in a declining use of the founder's personal network. Instead, six account managers were grafted internally to focus on initiating new foreign customers to develop Alpha's business network. The new market phase is a result of what was learned from interacting within Alpha's business network. The problems experienced in the reorganisation phase resulted in the use of grafting to acquire the needed knowledge that Alpha lacked. Alpha could now use the knowledge and personal networks of the new CEO and consultants to come into contact with the larger customers they needed.

In analysing Alpha's use of their networks during the internationalisation process, we have not considered performance measures. Despite this, the case study still gives an indication of some negative effects that followed as a result of the founder's extensive usage of human capital and his personal network. In the later phases of Alpha's internationalisation, the founder acknowledges that it was an unsuccessful strategy to focus on small biotech firms. Instead, diagnostics turned out to be an important market that had been overlooked from the start. We argue that the initial focus on small biotech firms was a result of the founder's human capital and personal network, which guided Alpha to initiate customer relationships in the biotech market instead of the diagnostics market. The analysis of Alpha thus emphasises the risks involved in using an entrepreneur's human capital and personal network too extensively. Even though an

entrepreneur has many experiences of previous successful activities, there is no guarantee that this knowledge can help the performance of a new born global. Crick and Spence (2005) showed that born globals face great challenges when using their networks for resource access. Our study supports these results, and we emphasise that these challenges should be given further attention among scholars.

Figure 1 Alpha's use of networks and grafting during its internationalisation process



Whereas existing born global research, to a large extent, has discussed whether it is the personal-network relationships or the business-network relationships that are the most important for a born global firm, we argue that neither of these kinds of networks is more important than the other. Instead, the most important aspect for a born global firm is to have the ability to learn from existing network relationships what knowledge and networks are needed in different phases of its internationalisation.

6 Conclusion

6.1 Limitations and suggestions for further research

The data that this study is built on were collected from one Swedish born global. Space limitations made it impossible to include more cases in this analysis. To be able to generalise the findings of this study further to include other business sectors and international markets, multiple case studies are needed.

We have not included performance measures in our analysis of the longitudinal case study. An analysis of the learning processes in relation to performance outcomes could provide additional understanding and explanation of born globals' internationalisation, and future research should therefore include performance measures. In doing so, a quantitative study could be used to provide further explanations of the early and rapid internationalisation of these firms.

Another limitation of this study is that it almost exclusively focuses on customers in the analysis of important business-network relationships. Additional theoretical and empirical work that includes an analysis of other network actors' impact on the learning of internationalising born globals would be useful to further validate the results of this study.

Acknowledgement

We gratefully acknowledge the financial support of Jan Wallander and Tom Hedelius's foundation, Handelsbanken, Sweden.

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Paper 2

The impact of different kinds of knowledge for
the internationalization process of born globals
in the biotech business.

Emilia Rovira Nordman and Sara Melén*

Published 2008 in *Journal of World Business*, 43(2): 171-185.

*The authors have equally contributed to this paper.



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Journal of World Business 43 (2008) 171–185



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The impact of different kinds of knowledge for the internationalization process of Born Globals in the biotech business

Emilia Rovira Nordman^{1,2}, Sara Melén^{1,*}

Department for Marketing and Strategy Stockholm, School of Economics, P.O. Box 6501, S-113 83 Stockholm, Sweden

Abstract

This study explores how different kinds of knowledge of founders and managers at Born Globals are related to the firms' discovery and exploitation of foreign market opportunities. Based on data from eight biotech Born Globals, we dichotomized Born Globals into two subsets: Born Industrials and Born Academics. The study shows that the founders' and managers' different combinations of technological and international knowledge impact the firms' proactive or reactive behavior in discovering foreign market opportunities. The results indicate that different kinds of Born Globals follow different internationalization processes and that Born Globals, therefore, should not be analyzed as a homogenous group, which has been the common perspective in previous research.

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Keywords: Born Globals; International entrepreneurship; Technological knowledge; International knowledge

1. Introduction

During the last decade, an increasing number of new ventures were shown to start internationalizing from inception or soon thereafter. Concepts such as Born Globals, international new ventures, or global start-ups have been introduced by scholars focusing on the phenomenon of early and rapidly internationalizing firms.³ Two activities essential to the internationalization

of Born Global firms are the discovery and exploitation of foreign market opportunities (e.g., the discovery of an opportunity to employ an individual who has important network connections in attractive foreign markets). Born Global firms operate in dynamic markets, in which windows of opportunity rapidly open and close. To survive, these firms in particular must be successful in how quickly, efficiently, and holistically they sense and act upon opportunities abroad (Crick & Spence, 2005; Dimitratos & Jones, 2005). In comparison to other firms, Born Globals, thus, face unique challenges when discovering and exploiting foreign market opportunities. The topic of opportunity discovery and exploitation has been identified as one requiring further study (Dimitratos & Jones, 2005; Styles & Seymour, 2006).

Previous studies have shown that one element influencing the internationalization of Born Global firms is the level of international knowledge acquired by founders and managers, often prior to the start-up of the firms (Madsen & Servais, 1997; McDougall, Oviatt, &

* Corresponding author. Tel.: +46 8 736 95 37; fax: +46 8 33 94 89.

E-mail addresses: emilia.rovira@hhs.se (E.R. Nordman), sara.melen@hhs.se (S. Melén).

¹ Sara Melén and Emilia Rovira Nordman appear in alphabetical order and have equally contributed to this paper.

² Tel.: +46 8 736 95 37; fax: +46 8 33 94 89.

³ In this study, we use the concept of Born Globals when referring to early and rapidly internationalizing firms. Influenced by other scholars (Autio, Sapienza, & Almeida, 2000; Knight & Cavusgil, 1996; Rennie, 1993), we define a Born Global as a firm that, from inception, discover and exploit opportunities in multiple countries.

Shrader, 2003; McDougall, Shane, & Oviatt, 1994). A founder's or a manager's knowledge of foreign markets is of great importance for Born Global firms, as these firms are new and, therefore, lack an organizational history. For this reason, firm-level knowledge cannot supersede individual-level knowledge (Autio, 2005). A significant number of Born Global firms have been found to operate within high-technology industries, and founders and managers working at these firms have sophisticated technological knowledge (Knight & Cavusgil, 1996, 2005; Madsen & Servais, 1997; Rialp, Rialp, & Knight, 2005; Sharma & Blomstermo, 2003), which has been shown to have an impact on these firms' internationalization. We make a distinction between these two kinds of knowledge, using the terms international knowledge and technological knowledge.

In this study, we integrate arguments from the Austrian School of Entrepreneurship (Hayek, 1945; Kirzner, 1997; Shane, 2000) with aspects of the Uppsala Internationalization Process Model (Johanson & Vahlne, 1977, 1990, 2003, 2006). We find these two schools' views on opportunity discovery to be complementary as both focuses on knowledge as a prerequisite for the discovery of opportunities. Because international knowledge and technological knowledge are shown to be important elements in Born Global research, the integration of these two schools' views is particularly effective, which we believe can shed new light on the phenomenon of Born Globals.

The purpose of this study is to explore how the levels of international and technological knowledge of founders and managers at Born Global firms are related to the firms' discovery and exploitation of foreign market opportunities. In our qualitative, explorative case studies of Swedish biotech firms, we identify similarities and differences in Born Globals' discovery and exploitation processes, and explore why such differences occur. The founders and managers of the investigated firms are those employees who have been responsible for taking strategic initiatives and have been involved in planning, managing, and executing the firms' initial internationalization processes, the phases under scrutiny in this study.

By conducting this study, we attempt to make three contributions to the field of Born Global research. First, a controversial issue within Born Global research is whether these firms are proactive or reactive in terms of their internationalization behavior. Traditional Born Global literature has strongly emphasized the proactive behaviors of these firms (Oviatt & McDougall, 1994, 1997) whereas more recent research has argued that Born Globals are reactive in their internationalization

(Sharma & Blomstermo, 2003). One similarity between the views of the Uppsala School and the Austrian School are that both perceive their respective processes (i.e., the internationalization process and the entrepreneurial discovery) as reactive. By examining the Born Globals' discovery and exploitation processes, we contribute to Born Global theory development by discussing the proactive and/or reactive behaviors of these firms and by clarifying the conflicting arguments surrounding this issue. Second, our study contributes to knowledge-based internationalization literature and the theoretical discussion of Born Globals' internationalization process by analyzing how the speed of internationalization is affected by the levels of technological and international knowledge possessed by these firms' founders and managers. Third, our examination of the Born Global phenomenon revealed a deficiency in existing research, which characterizes Born Globals as a homogenous group of firms. We claim that adopting this type of perspective may lead to a failure to notice certain crucial insights; therefore, these firms should be studied from a heterogeneous perspective.

This paper is structured as follows: The introduction is followed by a literature review of Born Global studies. The theoretical framework of this study is then provided. Next, the methodology of the study is discussed, followed by the presentation and analysis of case study data. The article then offers a discussion of the findings, recommendations for practitioners, and limitations, as well as suggestions for further research.

2. Knowledge and the Born Global firm

Born Globals are generally new firms that lack organizational histories. In comparison to established multinational corporations (MNCs), newly formed Born Global firms do not possess those deeply rooted routines, practices, and structures that often characterize long-established businesses. The knowledge found in a Born Global firm is thus stored within the individuals starting the firm rather than in the firm's procedures, norms, rules (March, 1991), and routines (Cohen & Bacdayan, 1994; Nelson & Winter, 1982). Scholars have claimed that firm-level knowledge cannot supersede individual-level knowledge in the Born Global firm (Autio, 2005; McDougall et al., 1994). The lack of established routines, practices, and structures could even be described as an advantage for these firms because they do not need to unlearn established practices, which has been shown to be a difficult task for older and more established firms

(Barkema & Vermeulen, 1998). In this instance, youth confers greater flexibility and agility (Knight, Madsen, & Servais, 2004). Because this study is about Born Global firms, our interest lies in studying individual-level knowledge and, more specifically, the knowledge of founders and managers at Born Globals. We focus on the tacit form of knowledge (i.e., knowledge that has been acquired from experience and depends on the context in which activities are performed). This form of knowledge is non-codified knowledge, which is hard to transfer to others. Based on the work of Penrose (1959) and Johanson and Vahlne (1977) we denote this form of knowledge as experiential knowledge. In this study, we use knowledge, experience, and capability as interchangeable concepts.

2.1. *The impact of the individual*

During the last decade, interest in the Born Global phenomenon mushroomed significantly and led to intensive discussions concerning which elements deserve attention in regard to the international development of these firms. One element, upon which a vast number of scholars seem to agree, is that founders and managers play a crucial role in the international development of these firms. In this brief literature review, we focus on this element of Born Globals and, thereby, limit our review to include studies that discuss the roles played by important key employees, namely the founders and managers of these firms.

McDougall et al. (1994) argue that Born Globals can be international from inception because their founders possess an unusual constellation of competences. Other scholars in the field have supported and further elaborated upon this argument (Andersson & Wictor, 2003; Crick & Jones, 2000; Crick & Spence, 2005; Knight & Cavusgil, 1996; Sharma & Blomstermo, 2003). It has, among other things, been demonstrated that founders and managers of Born Global firms have significant international experience prior to the establishment of their firms and that this experience is an important driver for their international development. Studies have also shown that it is important for founders and managers to have experience in the particular industry in which their new Born Global will operate (Madsen & Servais, 1997; McDougall et al., 2003). During prior experiences, these individuals have developed personal networks of customers and contacts, which can be used to acquire business advice and opportunities when starting the new firms (Crick & Jones, 2000; Sharma & Blomstermo, 2003).

Existing research about Born Globals has to a large extent focused on high-technology industries (Rialp et al., 2005) even though Born Globals exist in other industries as well (e.g., McDougall et al., 2003; Moen, 2002). This tendency may occur because the application of sophisticated technology and the development of unique products facilitate and even drive the internationalization of Born Globals. Many Born Globals thus rely on sophisticated technological knowledge (Knight & Cavusgil, 1996, 2005) that often is closely connected to the individuals working at these firms (Madsen & Servais, 1997; Sharma & Blomstermo, 2003). The impact of Born Globals' technological experience has also been studied by researchers who have used terms such as knowledge intensity (Yli-Renko, Autio, & Tontti, 2002) and technological learning (Zahra, Ireland, & Hitt, 2000). The results of these studies showed that technological knowledge is positively related to both international growth (Yli-Renko et al., 2002) and a higher level of financial performance (Zahra et al., 2000). Previous studies have thus shown that different kinds of knowledge influence the internationalization process of Born Globals. In this study, we contribute to knowledge-based internationalization literature by studying in depth the impact of two specific kinds of knowledge, namely international knowledge and technological knowledge. We argue that these kinds of knowledge influence the ability of Born Globals to discover and exploit new opportunities. International knowledge is a broad concept, encompassing specific international industry and marketing experience. We regard international knowledge as knowledge about managing relationships with foreign counterparts, and we define this knowledge as experiential knowledge about conducting business within an international setting. Technological knowledge is defined as experiential knowledge about the technology upon which a firm's products are built. We regard this knowledge to be purely technological and, thus, devoid of any business element. Therefore, we use technological knowledge to capture the experiential knowledge about technological issues connected to the founders and managers of the Born Global firms under investigation.

2.2. *The discovery and exploitation of opportunities within Born Global firms*

The discovery of opportunities that will lead to new business is crucial for the survival of Born Global firms. Agility and speed in relation to the exploitation of opportunities worldwide appear to be key factors of

success for these firms (Dimitratos & Jones, 2005). Earlier McDougall et al. (1994) commented on the exceptional ability of Born Global firms to discover opportunities in foreign markets. They noticed that the founders' unique backgrounds, knowledge, and networks enabled Born Globals to recognize opportunities for earning high returns in international markets, which were otherwise undetectable to others. Crick and Spence's (2005) study also showed that high performing small-and medium-sized enterprises (SMEs) are characterized by founders and managers who can identify and exploit international opportunities.

2.3. Uppsala school's perspective of discovery and exploitation of opportunities

Johanson and Vahlne (1977) argued that experiential knowledge enables firms to perceive concrete opportunities. Experiential knowledge helps firms realize how an opportunity can fit into present and future activities. This theoretical framework focuses on opportunities directly related to specific foreign markets. When firms act on these markets, the opportunities that they discover lead to the acquisition of new knowledge about how to conduct business in the markets, which in turn enhances their internationalization process. Experiential knowledge is obtained while interacting with other firms in the business network (Johanson & Vahlne, 1990; 2003). Resource commitments take place during the development of mutual relationships. When two firms are mutually connected, they can learn about and from each other. While interacting, they can also create new knowledge and develop opportunities for new business. Foreign market opportunities are thus developed as a consequence of the privileged knowledge business partners create when interacting with each other (Johanson & Vahlne, 2006). The process of opportunity discovery and exploitation is furthermore viewed from an opportunity development perspective, where knowledge development about and commitment to an opportunity are interrelated processes. The discovery of an opportunity and the decision to act on it happen almost simultaneously.

2.4. Austrian school's perspective of discovery and exploitation of opportunities

Kirzner (1997) argued the following:

An opportunity for pure profit cannot, by its nature, be the object of systematic search. Systematic search can be undertaken for a piece of missing information, but only because the searcher is aware of the nature

of what he does not know, and is aware with greater or lesser certainty of the way to find out the missing information (p. 71).

Kirzner (1997) stated that discovery happens in a situation of unknown ignorance when an entrepreneur is not aware what information is missing. A discovery is, therefore, naturally accompanied by an element of surprise, as the entrepreneur becomes aware of what previously had been overlooked. In contrast, a search can be undertaken for something that an entrepreneur knows is missing, and a successful search is, in this case, not followed by a surprise.

Using Casson (1982) as a theoretical reference, Shane and Venkataraman (2000) described entrepreneurial opportunities as those situations in which new goods, services, raw materials, and organizing methods can be introduced and sold at a profit. Kirzner (1997) perceived profit opportunities as events that are discovered and grasped by routine-resisting entrepreneurial market participants. To explain why some entrepreneurs, but not others, discover these opportunities, modern Austrian economics relies on assumptions of information asymmetry. The fact that people differ in the knowledge they possess is the source of entrepreneurship and opportunity discovery (Shane, 2000). Building on the work of Hayek (1945) and Kirzner (1997), Shane (2000) concluded that entrepreneurs discover opportunities related to the information they already possess and that their prior experience and education are, therefore, elements that influence the process of opportunity discovery. McKelvie and Wiklund (2004) claimed that the Austrian view emphasizes opportunity discovery but downplays opportunity exploitation. They also pointed out that a linear relationship between opportunity discovery and opportunity exploitation is commonly assumed. Entrepreneurs first discover an opportunity, which thereafter is exploited (Shane & Venkataraman, 2000). Opportunity exploitation is, in other words, considered a function of opportunity discovery (Shane, 2000). McKelvie and Wiklund (2004) strongly objected to this view as their study showed a mutual relationship between opportunity discovery and opportunity exploitation. They argued that opportunity exploitation influences opportunity discovery, and vice versa.

2.5. Integrating ideas from the Uppsala school and the Austrian school

Both the Uppsala School and the Austrian School assume their respective processes to be path dependent

and, thus, emphasize that prior knowledge influences the discovery of opportunities. Previous studies have demonstrated both of these theories to be relevant to the field of international entrepreneurship. McDougall et al. (1994) used arguments from the Austrian School to explain the early, rapid internationalization by new firms. Furthermore, several scholars have found that experiential knowledge is integral to the internationalization process of Born Globals (Autio et al., 2000; Sharma & Blomstermo, 2003). Their findings were in contrast to those of scholars who claimed the Uppsala model to be deterministic in nature (Bell, 1995; Reid, 1981) and, thus, not valid for studying Born Globals' internationalization (Bell, 1995). In this study, we support the arguments made in knowledge-based internationalization literature and advance the argument that the path-dependent nature of the Uppsala model does not prevent path-breaking learning to occur. Prior knowledge influences firms' internationalization process but does not determine these firms' paths of opportunity discovery and exploitation in a direct relationship. We thus find these two theoretical schools to be valid for studying opportunity discovery and exploitation within the field of international entrepreneurship.

In this study, we are interested in those opportunities that are related to Born Global firms' new business operations in foreign markets and refer to these opportunities as foreign market opportunities. Drawing on the research of Shane and Venkataraman (2000), we define these types of opportunities as those situations in which new goods, services, raw materials, and organizing methods can be introduced in a specific foreign market. In contrast to the Austrian view, these opportunities must not be directly connected to profit. We instead follow the Uppsala School's view in claiming that foreign market opportunities can imply an increased knowledge of foreign markets and of how to conduct business in these markets. One similarity between the two schools is that they consider the discovery of opportunity to be a reactive process because a discovery cannot result from an active search. This view differs from that of traditional Born Global

research, which describes these firms as proactive in their behavior (Madsen & Servais, 1997; Oviatt & McDougall, 1994, 1997) thus indicating that Born Globals' discoveries of foreign market opportunities are driven by proactive behavior. In this study, we perceive opportunity search activities as activities performed by Born Globals that know what is missing and how it can be found. These types of activities can be planned in advance. Opportunities that are discovered within ongoing foreign market activities are a consequence of chance rather than of planned activities. The concept of chance has been related to opportunities in entrepreneurship research (Bouchikhi, 1993) and is something that cannot be controlled by entrepreneurs and, consequently, planned. To determine whether Born Globals' discoveries are driven by proactive or reactive behavior, we argued that search activities reflect proactive behavior, whereas ongoing interactions with individuals in a specific foreign market reflect reactive behavior.

In our study, we considered the individual biotech firms to be the units of analysis. To investigate these firms, we explored how the levels of international and technological knowledge of the founders and managers have an impact on the processes of discovery and exploitation. Because Born Globals often compete in dynamic markets, we also argued that opportunity exploitation needs to be included to understand their discovery of opportunities. In dynamic markets, opportunities come and go at a rapid pace. To survive, these firms must be able to discover and exploit quickly the opportunities that they detect. We regard opportunity exploitation as the commitment of resources to a specific foreign market. We summarize our theoretical discussion by presenting definitions of the key concepts that have already been discussed and are used in this study (see Table 1).

3. The exploratory study: research method

To explore "how" Born Globals in the biotech industry handle their internationalization processes, we

Table 1
Definition of key concepts used in this study

Key concept	Definition
International knowledge	Experiential knowledge about conducting business within an international setting
Technological knowledge	Experiential knowledge about the technology upon which the Born Global firm's products are built
Foreign market opportunity	Those situations in which new goods, services, raw materials, and organizing methods can be introduced in a specific foreign market
Opportunity search activity	Those activities in which a firm is able to define what is missing and how it can be found
Ongoing foreign market activity	Ongoing interactions between a firm and individuals in a specific foreign market

Table 2
The investigated Born Global firms in 2003, at the beginning of the study

Firm	Business	Founded	No. of staff	Turnover (Thousands of USD)	Net profit/loss (Thousands of USD)	No. of interviews
A	Develops and sells microfluidic solutions for the life science industry	2000	70	639	−28048	5
B	Develops and sells products for genetic analysis in clinical research	1997	90	11 950	−24256	4
C	Develops and sells microsystems for the life science industry	1998	29	2 012	−2725	11
D	Develops and sells new drugs and dosage forms for improved drug treatment	1995	19	2 756	−3075	1
E	Develops and sells ready-made adjuvants for animal vaccine development	1999	7	933	−516	2
F	Develops and sells diagnostic products within the area of veterinary medicine and food safety	2001	25	2 450	−494	4
G	Develops and sells high-quality biochemicals for the life science industry	1995	10	1 076	123	5
H	Develops and sells products within the area of biological control and plant growth stimulation	1996	13	922	−1091	1

used a qualitative case study approach. Because we want to investigate context-specific phenomena with the aim of providing rich insight into human behavior, qualitative data are appropriate in this type of study (Guba & Lincoln, 1994). Qualitative (informal) interviews and observations are, furthermore, believed to provide the best opportunities for the study of processes (Gummesson, 1991). We decided to use a case study approach because this type of approach is generally preferred when “how” or “why” questions are posed (Yin, 2003) and when the aim is to build new theory from data (Eisenhardt, 1989).

We focused on the Swedish biotech industry because it is an example of a highly internationalized industry signified by rapid change and growth. The Swedish biotechnology industry has, in fact, had the most rapid growth of all sectors in Sweden during the last 10 years (SwedenBIO, 2005), thus making itself one of the leading biotech industries in the world. The next step in our data collection was to find a number of suitable candidates to become case firms. We selected the case firms from “The Swedish Biotech Industry Guide,” a database that lists and offers information about most Swedish biotech firms. We chose to focus on the large biotech cluster in Uppsala because this concentration of a group of firms in a single location facilitated data collection by providing continuous access to the founders and managers within the firms. To be included in this study, potential case firms also had to have their founders still working at their firms, had to conduct their own research and development (R&D), and must have at least one product sold in a foreign (i.e., non-Swedish) market. These criteria were chosen so that we could find

internationally active firms capable of managing the production chain themselves: from R&D to the interaction with international actors. These criteria limited the number of potential cases dramatically. We chose to contact qualified candidate case firms randomly. We started out by contacting one firm by telephone and then gradually continued to add firms in the same manner. All of the firms that we subsequently contacted agreed to participate in the study. Data collection was stopped after 14 companies had been visited. Because the interviews conducted at the last few firms provided us with narratives similar to those we had previously heard, the theoretical saturation point seemed to have been reached. New insights into the phenomenon (of biotech firms’ internationalization) were no longer gained, and the phenomenon, therefore, had been substantially explained (Glaser & Strauss, 1967). The theoretical saturation also indicated that it was unlikely that we would draw an incremental improvement of theory if we were to continue investigating more firms (Eisenhardt, 1989).

Only eight of the 14 firms were included in this study because these firms were the only ones that could be considered Born Globals. Tables 2 and 3 show that these eight firms fit into the commonly used operationalization that views Born Globals “as firms less than 20 years old that internationalised on average within three years of founding and generate at least 25 percent of total sales from abroad” (Knight et al., 2004, p. 649). Of the six firms that were excluded, one was too old (22 years) to be considered a Born Global and the remaining five firms had their first international sale more than three years after their inception (4, 8, 10 and 13 years).

Table 3
The Born Globals' internationalization

Firm	Year of first foreign sale	Export percentage (compared to total sales)	Foreign market entries since foundation (regions of the world)	Internationalization modes	Nature of important value-creating activities in foreign markets ^a
A	2000/2001	80% (within 3 years after foundation)	Europe North America	Direct export to the closest European markets and own sales subsidiaries in the USA, Great Britain, and Germany. Distributors are used in several other European markets	Marketing and distribution
B	1999/2000	85% (within 3 years after foundation)	Europe North America South America Asia Africa Oceania	Direct export to the closest European markets and own sales subsidiaries in the USA, Great Britain, Germany, France, and the Benelux countries. Distributors are used in the other regions of the world	R&D, production, marketing, and distribution
C	1999	70% (within 6 years after foundation)	Europe North America	Develops products in cooperation with customers in Finland, Norway, Great Britain, the USA, and Germany	No important value-creating activities in foreign markets
D	1997	100% (within 3 years after foundation)	Europe Asia	Has sold a license for a product to a Japanese customer. Distributors are used in other markets	Marketing and distribution
E	1999/2000	98% (within 3 years after foundation)	Europe North America South America Asia Oceania	Has sold licenses to different firms in Europe and to Australia. Participates in research collaborations with organizations in North America, South America, and Asia	R&D and marketing
F	2001/2002	90% (within 3 years after foundation)	Europe North America South America Asia Africa Oceania	Uses direct export and seventeen distributors to reach the international markets	R&D, marketing, and distribution
G	1995/1996	28% (within 3 years after foundation)	Europe North America South America Asia Africa Oceania	Uses direct export to reach the international markets, except in Switzerland where a distributor is used	Marketing and distribution
H	1998	30% (within 10 years after foundation)	Europe	Uses direct export to reach the European markets, except in Finland where a distributor is used	Production, marketing, and distribution

^a We see the most important value-creating activities as the key aspects of the value chain, namely research and development (R&D) activities, production, as well as marketing and distribution (Jones, 1999).

3.1. Data collection

In this study, we considered the individual biotech firms to be the units of analysis. To investigate their international development, we chose to conduct interviews with the group of founders and managers that had

been most responsible for managing the firms' internationalization processes. The first interviewees were always (one of) the founders. They, in turn, helped us identify other individuals who had been most involved in handling the internationalization processes of the firms (Yin, 2003).

Between January 2003 and June 2005, we conducted face-to-face interviews.⁴ 33 face-to-face, semi-structured interviews were conducted with founders and managers at the eight firms. The interview times ranged from 40 to 160 min per interview with an average duration of around 120 min. All of the interviews, except for one that was conducted at a trade fair, were held at the firms' head offices in Uppsala, which enabled us to form a more in depth characterization of the individuals and places that we visited (Creswell, 2003).

A major strength of a case study data collection is the opportunity to use different sources of evidence (Creswell, 2003; Yin, 2003). Multiple sources of evidence are also particularly important in terms of strengthening the construct validity.⁵ In addition to conducting semi-structured interviews with different employees at most of the sites, we used archival documentation from the firms and information about the firms collected from databases such as master theses, articles, and annual reports. We also established evidence chains and found that the documentary evidence corroborated with the stories provided by the different founders and managers. Another test was to receive feedback on drafts of the cases from the interviewees.

A key feature of this study's research design is the use of multiple cases, and our data analysis is based on comparing the findings of the individual cases. Comparative case studies of firms within the same industrial context facilitate comparison through replication of results, either literally (when similar responses emerge) or theoretically (when contrary results emerge for predictable reasons), and, thus, enable analytic generalization. Case studies rely on analytical generalization, in which the investigator strives to make a generalization about a particular set of results so as to fit into a broader theory. To strengthen the external validity of our multiple case studies, we followed an experiment-like replication logic when collecting the data (Yin, 2003). To ensure that the same topics were covered at all of the firms, we utilized a three-and-a-half-page interview guide.

⁴ Since June 2005, we have continued to follow the development of these firms by collecting secondary data and conducting phone interviews with respondents at the investigated firms.

⁵ The quality of empirical research in this explorative study was measured only in terms of construct validity, reliability, and external validity because internal validity is a concern only in causal (or explanatory) case studies (Yin, 2003).

To increase the reliability of the study, we kept a detailed account of our activities in a research protocol, which included transcripts of the audiotape recordings from all of the interviews, transcripts of our field notes and observations, and transcripts of the secondary data. Because the goal of reliability is to minimize errors and biases in a study, we enlisted two researchers to conduct the interviews at the investigated firms. The convergence of observations from multiple investigators enhances confidence in the findings and may even augment the creative potential of a study because complementary insights increase the richness of data (Eisenhardt, 1989).

4. Cross-case analysis

To analyze the data from the eight case studies, we used cross-case synthesis. This technique treats each individual case as a separate study, and the analysis can reveal similarities as well as differences (Yin, 2003). Examples from all of the cases are presented in Table 4, which is followed by a discussion that includes vignettes from different cases within each group.

4.1. International and technological knowledge

All of the eight firms in the study had founders and managers who possessed high levels of technological knowledge. Because these individuals had firsthand experience in developing their firms' products, they had the most solid technological knowledge possible, as far as the products were concerned. The importance of technological knowledge was also emphasized by one of company C's account managers, who remarked, "In this work, technical competence is more important than marketing competence... It is important that the individuals who sell our products have a broad technological knowledge-base so that they can solve the problems that our customers have."⁶

Although a high level of technological knowledge was evident in all of the case firms, our analysis showed that the founders' and managers' levels of international knowledge differed among the eight firms. Four of the Born Globals (A, B, C, and D) were started by individuals who had a great deal of experience managing international operations and possessed high levels of international knowledge. Company B was a

⁶ Excerpt from an interview with one of company C's account managers, February 27, 2003.

Table 4
The Born Globals' discovery and exploitation of foreign market opportunities

International knowledge/ technological knowledge	Ongoing foreign market activities/search activities	Example of a discovery of a foreign market opportunity	Exploitation of a foreign market opportunity
The born industrials			
<p>A The founders and managers have solid industrial backgrounds from working in multinational firms within the pharmaceutical industry. High levels of both international and technological knowledge characterize the firm</p>	<p>Uses search activities to find foreign market opportunities</p>	<p>The marketing manager seized the opportunity to recruit an old colleague from his previous workplace. This Englishman had many useful network connections in Great Britain and used them to bring company A its first British customers. In the initial phase of the firm's existence, company B spent a great deal of resources creating awareness about the firm and its products. Company B's first international customer was an American company that had noticed the firm's targeted marketing and contacted company B as a consequence</p>	<p>Company A's strategy was, from the start, to open its own sales subsidiaries in the most important target markets. As in the case of the Englishman, all of the local sales staff were recruited locally. This involved a significant commitment of resources to these foreign markets. The American market was one of company B's target markets. A sales subsidiary was opened in this market to create a close relationship with American customers, which involved a significant commitment of resources to this market</p>
<p>B The founders and managers have solid industrial backgrounds from working in multinational firms within the pharmaceutical industry. High levels of both international and technological knowledge characterize the firm</p>	<p>Uses search activities to find foreign market opportunities</p>	<p>One of company C's first foreign customers was a large Finnish firm. The founder became interested in developing a technological application for this firm and inquired from different network connections whether they knew anyone at the Finnish firm that he could talk to about this. From a network connection, he received the names of two employees who worked at the firm. Before the founder had made the time to contact them, he accidentally ran into them at a conference in Germany, and a deal was made</p>	<p>When company C sells applications for its products to foreign customers, it commits resources to foreign markets because product applications have to be developed in close collaboration with international customers. Even though the firm has not committed enough resources to open its own sales subsidiaries in the target markets, the staff often travels to meet their customers face-to-face</p>
<p>C The founders and managers have solid industrial backgrounds from working within the life science industry. High levels of both international and technological knowledge characterize the firm</p>	<p>Uses search activities to find foreign market opportunities</p>	<p>Company D's first international customer was a Japanese firm that had contacted company D because it had wanted to purchase a license for a product that it wanted to sell on the Japanese market. This firm had learned about company D while coming across one of its patent applications</p>	<p>Company D regarded the cooperation with the Japanese firm as a great opportunity to enter and learn about this market; it committed resources to this market by staying in close contact with this Japanese partner</p>
<p>D The founders and managers have solid industrial backgrounds from working within the life science industry. High levels of both international and technological knowledge characterize the firm</p>	<p>Uses search activities to find foreign market opportunities</p>	<p>Company D's first international customer was a Japanese firm that had contacted company D because it had wanted to purchase a license for a product that it wanted to sell on the Japanese market. This firm had learned about company D while coming across one of its patent applications</p>	<p>Company D regarded the cooperation with the Japanese firm as a great opportunity to enter and learn about this market; it committed resources to this market by staying in close contact with this Japanese partner</p>

Table 4 (Continued)

International knowledge/ technological knowledge	Ongoing foreign market activities/search activities	Example of a discovery of a foreign market opportunity	Exploitation of a foreign market opportunity
The born academics			
E The founders and managers have solid academic backgrounds as university researchers. The firm is characterized by a high level of technological knowledge and a low level of international knowledge	Uses ongoing foreign market activities to find foreign market opportunities	One of company E's first Chinese research collaborators heard about the firm via a Chinese student. This person was studying at Uppsala University where he had learned about company E's products. When he returned to China, he later told a Chinese firm about company E, and it, consequently, contacted the firm	Company E has committed resources to the Chinese market even though most of the communication is managed via email. Company E meets its partners about once a year, and the founder has already traveled to China several times
F The founders and managers have solid academic backgrounds as researchers at a governmental research institute. The firm is characterized by a high level of technological knowledge and a low level of international knowledge	Uses ongoing foreign market activities to find foreign market opportunities	Company F uses distributors to handle most of its foreign sales. Usually, distributor firms initiate contact with company F—the other way around. However, company F met its Belgian distributor at a trade fair in Germany. The meeting was coincidental, but after evaluating the distributor, company F decided to start cooperating with the firm and made it responsible for the Belgian market	Belgium was a market where company F had not been previously present. The firm commits resources to the market by following up the distributors work. The employees keep in continuous contact with the distributors and even conduct regular visits to their home offices, where the distributors are educated about the application and use of company F's products
G The founders and managers have solid academic backgrounds as researchers at the university and a governmental research institute. The firm is characterized by a high level of technological knowledge and a low level of international knowledge	Uses ongoing foreign market activities to find foreign market opportunities	One of company G's first German customers started contacting the firm via email and telephone. Company G had not marketed itself toward the German market, but customers had heard about its products from another German firm	To exploit the opportunity that had revealed itself in the German market, company G decided to commit resources to the German market by employing a German student for six months. This individual communicated with the customers in German via email and telephone, and also translated material about the products into German
H The founders and managers have solid academic backgrounds as university researchers. The firm is characterized by a high level of technological knowledge and a low level of international knowledge	Uses ongoing foreign market activities to find foreign market opportunities	Company H's first Austrian customers came in contact with the firm via one of the founders. A person at this Austrian organization first heard about the products when he and this founder worked together in an EU-sponsored research project. The Austrian became interested in company H's products and wanted to import them	Because Austria is well known for its ecological farming, this was an important market for company H. The firm has committed resources to this market by working at convincing the Austrian government to approve the sales of the products in the market

typical example of this type of Born Global. Most of the employees who were responsible for the firm's initial internationalization had solid industrial backgrounds as managers in multinational firms within the pharmaceutical industry. One of the founders commented that "Our internationalization strategy is a result of the collected experience of our management team. Our approach has always been to employ industrialists who have experience of participating in internationalization processes from their previous places of employment."⁷

In contrast to companies A, B, C and D, the other four Born Globals in the study (E, F, G, and H) were started by individuals who possessed high-ranking academic titles but lacked knowledge about foreign market business. These individuals gained technological knowledge while working in academic settings, such as universities and governmental research institutes, but had low levels of international knowledge. Company E's founder even said that "There has never been any explicit knowledge about internationalization within the firm."⁸

When we analyzed the levels of international and technological knowledge of all the eight firms' founders and managers, two subgroups emerged. The first group consisted of firms A, B, C, and D, which we referred to as the "Born Industrials" because all of these firms were started and initially managed by individuals who possessed an experiential knowledge combination consisting of high levels of both technological knowledge and international knowledge. In contrast, firms E, F, G, and H were denoted "Born Academics" because they were founded and initially managed by researchers with academic backgrounds. The founders and managers of these firms typically possessed an experiential knowledge combination that consisted of high levels of technological knowledge and low levels of international knowledge. Examples of the discovery and exploitation of foreign market opportunities by these two groups are summarized in Table 4.

4.2. The discovery of foreign market opportunities

The four Born Industrial firms are all characterized as having from the very start a clear and settled strategy on which markets and customers to focus. One of company B's founders made the following comment:

We have always worked in accordance with a clearly defined strategy. It was the marketing director and the CEO that developed the strategy, and their previous experiences affected its design. The internationalization strategy that was developed already in 1999 said that we were to handle our own entry into the most important geographical markets and let distributors handle the rest.⁹

Similar to company B, the other Born Industrials followed a clear internationalization strategy and performed focused search activities to better position themselves in an effort to capitalize on any foreign market opportunities available in their target markets. The Born Industrials had thus decided on the objective of their search activities and on how these activities were to be performed—sometimes these decisions were made even before the firms had started selling their products.

In contrast to the Born Industrials, the Born Academics (companies E, F, G and H) initially did not have clear and settled objectives of which markets and customers to target, thus it was evident that these firms were not following a specific strategy. The senior vice president of company F acknowledged that "When we started, we rather worked in accordance with a vision than a formulated strategy. Our goal was to produce the best possible tests within our segment."¹⁰ The marketing director at the same firm also noted that "So far, we have rather met our customers by coincidence than as a result of an active search process."¹¹ Based on these comments and our analysis of the other cases, it appears that Born Academics are characterized by their ongoing foreign market activities rather than by their own search activities.

Because the Born Industrials are focused on searching for opportunities that have been identified as crucial, the possibility of making unexpected discoveries based on pure chance is limited. These firms typically discover opportunities within the context of those markets they have already targeted. For example, companies A, B, and C in our study discovered opportunities in the same markets where they had already performed search activities (see Table 4). Our data analysis also provided examples

⁷ Excerpt from an interview with one of company B's founders, February 13, 2003.

⁸ Excerpt from an interview with company E's founder, March 4, 2003.

⁹ Excerpt from an interview with one of company B's founders, February 13, 2003.

¹⁰ Excerpt from an interview with company F's senior vice president, March 19, 2003.

¹¹ Excerpt from an interview with company F's marketing director, March 26, 2003.

of Born Industrials discovering opportunities based on chance rather than as a result of planned search activities, exemplified here by the case of company D being contacted by a Japanese customer (see Table 4). However, the overall analytical pattern indicates that the discovery of opportunities as a consequence of chance is generally not significant for Born Industrials. One of company A's founders acknowledged that "I cannot give one example of an event that has been totally unplanned. This has to do with the responsibility of using venture capital investments. You have a great responsibility, and every action has to be well considered and planned."¹²

In comparison, the Born Academics (companies E, F, G, and H in this study) did not follow an explicit strategy for discovering foreign market opportunities. Their discoveries occurred as a consequence of their ongoing foreign market activities rather than of focused searches. They discovered foreign market opportunities by chance in markets that they had not considered prior to the occurrence of the unexpected discovery (see Table 4).

Table 4 also shows that some of the Born Globals made use of their staff members' networks of relationships as a means of discovering foreign market opportunities. The networks could be used to discover useful employees (as in the case of company A), to provide helpful advice (as in the case of company C), or to find individuals who could function as gateways to new customers (as in the case of company E and H). We also noticed that the Born Industrials made discoveries in their networks as a consequence of conducting active searches. For example, company A searched its staff's business networks to find good employees. In addition, company C's founder used his existing business network to find information about the Finnish firm. In contrast, company E and H (Born Academics) had not searched their founders' and managers' networks to find gateways to the Chinese and Austrian markets; however, these opportunities appeared by chance as a result of the firms' ongoing research activities.

4.3. *The exploitation of foreign market opportunities*

The eight Born Globals in this study also differed in their means of exploiting foreign market opportunities. For example, two of the Born Globals (companies A and

B) established sales subsidiaries with local staff in target markets where they discovered foreign market opportunities (see Tables 3 and 4). In comparison to the other firms, companies A and B were larger and had received greater financial resources in the form of venture capital at their inception. These resources enabled them to set up sales subsidiaries and, thus, rapidly commit large amounts of resources to these markets. The founders' and managers' high levels of international knowledge could explain the venture capitalists' decision to invest such relatively large amounts of financial resources in these two firms. One of the founders of company A commented that "Our management's extensive leadership experience in the industry has had a significant effect on our efforts to attract money."¹³ For the Born Academics and the other two Born Industrials (companies C and D), only comparatively limited amounts of resources were committed to exploiting discovered foreign market opportunities. In comparison to the large initial investments of companies A and B, the increase in resource commitments by these Born Globals followed a more incremental pattern.

5. Discussion

The purpose of this study was to explore how founders' and managers' levels of international knowledge and technological knowledge are related to Born Global firms' discovery and exploitation of foreign market opportunities. Our investigation revealed both similarities and differences among the eight Born Globals included in our study. All of these Born Globals sell products to several regions of the world. A majority of the firms used direct sales and distributors to reach customers; however, two of the firms also opened their own sales subsidiaries in target markets. The value-creating activities in foreign markets differed among the firms, ranging from company C, which handles all activities from its head office in Sweden, to company B, which handles R&D, production, marketing, and distribution activities in foreign markets (see Table 3).

Even though these firms differed in some areas, they shared one major similarity: All of them were initially managed by individuals with high levels of technological knowledge. Since all of the investigated Born Globals are biotech firms, specialized in applications of sophisticated technology and the development of unique products, the founders' and managers' high

¹² Excerpt from an interview with one of company A's founders, February 7, 2003.

¹³ Excerpt from an interview with one of company A's founders, February 7, 2003.

levels of technological knowledge were used to sell the firms' products in international markets. The analysis reveals that often it were the international customers that instigated the business relationships with the Born Globals, because they became interested in the products and technical solutions that these firms could provide. This suggests that technological knowledge has a positive impact on the early internationalization of the investigated firms.

Even though all the investigated Born Globals' founders and managers possess high levels of technological knowledge, the same cannot be said for their levels of international knowledge. Because of the difference in the degree of international knowledge possessed by these founders and managers, we recognized a need to dichotomize the concept of Born Globals into two subgroups. Born Industrial firms are characterized by their founders' and managers' combinations of high levels of both technological and international knowledge, whereas Born Academics are characterized by their founders' and managers' combinations of high levels of technological knowledge and low levels of international knowledge.

The founders' and managers' levels of technological and international knowledge are also related to how Born Industrials and Born Academics discover foreign market opportunities. The high levels of international knowledge of founders and managers in Born Industrial firms have been used to plan these firms' structured internationalization strategies. Born Academics, with founders and managers that possess only low levels of international knowledge, do not work in accordance with a structured internationalization strategy. Born Industrials have, for the most part, discovered foreign market opportunities within the context of their search activities. Thus, the discovery of foreign market opportunities by Born Industrials is driven by a proactive behavior. In contrast, Born Academics are characterized by their tendency to discover foreign market opportunities in their ongoing foreign market activities. Because Born Academics discover opportunity as a consequence of chance rather than of planned activities, we consider this particular type of behavior to be reactive.

In the literature, Born Globals have been described as having an advantage in being more flexible because of the lack of established practices and routines stemming from the absence of an organizational history (Knight et al., 2004). In this study, Born Academics appeared to be more flexible than Born Industrials because these firms' discoveries were made as a consequence of chance rather than of a proactive

search. However, we do not imply that Born Academics necessarily discover better or more profitable opportunities than Born Industrials. The meaning of flexibility here is that Born Academics are more open to discovering unexpected opportunities because they are not as constrained by the boundaries of structured search activities in specific target markets as Born Industrials.

Our study also showed that two of the Born Industrials (company A and B), in comparison to the group of Born Academics, exploit their foreign market opportunities more rapidly by committing more resources to foreign markets in their initial investments, whereas Born Academics generally exploit their opportunities in a more incremental pattern. This also suggests that Born Industrials tend to internationalize more rapidly than Born Academics. Whereas, previous studies within the field of early and rapid internationalization of firms have strongly emphasized that Born Globals' speed of internationalization differs from the internationalization pattern of large, established MNCs, few studies have, to the best of our knowledge, acknowledged the differences in internationalization processes that can exist within the group of Born Globals. By presenting findings that the internationalization processes of Born Global firms differ due to the individual knowledge combinations of founders and managers, our study makes an important contribution to knowledge-based internationalization literature, as well as to the theoretical discussion of Born Globals.

Compared to several other studies of Born Globals (Andersson & Wictor, 2003; Crick & Jones, 2000; Crick & Spence, 2005; Oviatt & McDougall, 1997; Sharma & Blomstermo, 2003), our study contributes to this research field by demonstrating that not all Born Globals are started by individuals with high levels of international knowledge. Some Born Globals are instead founded and managed by individuals who solely rely on their high levels of technological knowledge. The differences in their combinations of technological and international knowledge in turn impact their behavior in discovering foreign market opportunities. Our study demonstrated that Born Academics discover foreign market opportunities in accordance with the reactive behavior described in the Austrian School of Entrepreneurship and the Uppsala Internationalization Process Model. In contrast, Born Industrials were found to demonstrate a proactive behavior toward the discovery of foreign market opportunities, thus supporting the arguments put forward in traditional Born Global research (Madsen & Servais, 1997; Oviatt & McDougall, 1994, 1997).

The dispute surrounding this issue may be a consequence of existing Born Global research, which almost exclusively has regarded Born Globals as a homogenous group of firms. Even though recent research has started creating typologies of Born Globals (Knight & Cavusgil, 2005), we claim that research analyzing Born Globals as heterogeneous groups of firms is needed to gain a deeper understanding of these firms' internationalization behavior.

Because differences in internationalization processes exist within the group of Born Globals under investigation in this study, this finding suggests that no one theory can be used to explain the behaviors of all Born Globals. Even though this study confirms the relevance of the Austrian school and the Uppsala school in explaining the internationalization pattern of one group of Born Globals (e.g., Born Academics), we also find that another group of Born Globals (e.g., Born Industrials) follows the internationalization pattern explained by traditional Born Global research. Therefore, to explain the internationalization processes of several groups of Born Globals, we find that a more holistic theoretical approach is needed to guide this field of Born Global research to new, pioneering insights into firms' internationalization processes.

5.1. Recommendations for practitioners

Firms that operate in dynamic markets and are subjected to frequent market changes need the ability to adapt rapidly to new conditions and opportunities. The previous knowledge of the founders and managers can influence the way that they will react to emerging opportunities. Individuals with high levels of international knowledge are more likely to make decisions similar to those that have proved to be successful in the past, whereas individuals with low levels of international knowledge seem to be more open to discovering unexpected opportunities. As most Born Global firms need both the benefits of experience and the ability to adapt rapidly to new conditions and opportunities, staff with different experiences of internationalization processes can be a solution. A good balance can be achieved by matching the existing employees with new ones, whom possess the kind of knowledge that the firm lacks.

6. Limitations and suggestions for further research

Because of the limitations of time and space, this study focused on the prior experiences of founders and

managers at Born Globals and the theoretical concept of experiential knowledge. Other factors that might have influenced the various internationalization patterns of the Born Global firms, such as the impact of the founders' and managers' motivations or personality traits, have thus been disregarded in this study. Future research that includes these aspects could increase the knowledge of and insight into these kinds of firms. A second limitation has to do with the fact that we analyzed only the first phase of the internationalization of Born Globals under investigation, and did not discuss how differences in the discovery and exploitation of opportunities have influenced the performances of these firms. Future research about Born Globals should include performance measures to determine if differences in performance between Born Globals exhibiting reactive behavior (i.e., Born Academics) and those exhibiting proactive behavior (i.e., Born Industrials) exist. Further qualitative studies with longitudinal approaches could be conducted to follow up the performances of these firms and, thereby, present a more holistic picture of the effects of these differences.

The case study approach is receiving greater scientific approval because it produces results with a high level of validity, from which generalizations can be drawn. However, the narrow scope of this study, which focused on only Born Global case firms in one industry of one country, does not permit broad generalizations to be made based on our findings. Therefore, conducting quantitative studies in the future, from which generalizations can be derived, may prove useful.

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Paper 3

The internationalisation modes of Born Globals: A longitudinal study

Sara Melén and Emilia Rovira Nordman*

Published 2009 in *European Management Journal*, 27(4): 243-254.

*The authors appear in alphabetical order and have equally contributed to this paper.



The internationalisation modes of Born Globals: A longitudinal study

Sara Melén¹, Emilia Rovira Nordman^{*,1}

Department for Marketing and Strategy, Stockholm School of Economics, P.O. Box 6501, S-113 83 Stockholm, Sweden

KEYWORDS

International entrepreneurship;
Born Globals;
Internationalisation modes;
Commitment;
Foreign customer knowledge

Summary This study explores which internationalisation modes Born Globals use in their initial and continued internationalisation. Based on longitudinal data from eight biotechnology Born Globals, we divided the firms into three subsets: the low committers, which use low commitment internationalisation modes in their initial and continued internationalisation; the incremental committers, which experience an increase from low to high commitment modes in their continued internationalisation; and the high committers, which use both low and high commitment internationalisation modes from inception. The critical difference amongst the three subsets is the speed at which these firms commit resources to foreign markets.

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Introduction

The phenomenon of Born Globals has attracted major interest within the field of international entrepreneurship. Most studies in this field have focused on the formation of these firms and their initial internationalisation process. In this respect, our understanding of these firms is limited because little is known about the continued internationalisation of Born Global firms. Liesch et al. (2007) have acknowledged this research gap, and called for more research on what happens to Born Globals after their initial operations in foreign markets have been established. This study answers this call for research by addressing the

following research question: Which internationalisation modes do Born Globals use in their initial and continued internationalisation processes? In an attempt to answer this research question, we conducted longitudinal case studies of eight Born Globals that are active in the Swedish biotechnology field. Influenced by other scholars (Autio et al., 2000; Knight and Cavusgil, 1996), we define a *Born Global* as a company that, from its inception, discovers and exploits opportunities in multiple countries. We decided to focus on the Swedish biotechnology field because it is an example of a highly internationalised field characterised by rapid change and growth. Knowledge-intensive, biotechnology Born Globals are moreover relatively common in Sweden because the country's small geographic size allows knowledge to be frequently created as a result of interactions amongst companies, institutes, and universities (OECD, 2002), which help to produce a large knowledge base.

* Corresponding author. Tel.: +46 8 736 95 37; fax: +46 8 33 94 89.

E-mail addresses: sara.melen@hhs.se (S. Melén), emilia.rovira@hhs.se (E.R. Nordman).

¹ The authors appear in alphabetical order and have contributed equally to this article.

Based on previous studies, we know that Born Globals start their internationalisation process by simultaneously using multiple and different internationalisation modes (Andersson and Wictor, 2003; Sharma and Blomstermo, 2003). These findings challenge the conventional view presented in knowledge-based internationalisation process theory, which suggests that firms experience an incremental development in the internationalisation modes used during their internationalisation processes (Johanson and Vahlne, 1977; Johanson and Wiedersheim-Paul, 1975). However, as Young et al. (2003) point out, 'insufficient emphasis has been given to entry and subsequent market servicing modes used by international entrepreneurial firms' (p. 37). The purpose of this study is, therefore, to explore which internationalisation modes Born Globals use during their initial and continued internationalisation. The term *internationalisation mode* refers to the organisational structure that companies use to enter and penetrate foreign markets (Agnadal and Chetty, 2007). To fulfil the purpose of this study, we broadened the definition to include the internationalisation modes used by companies during their initial entry into foreign markets and their continued internationalisation.

This study contributes to international entrepreneurship research in several ways. First, for research about international entrepreneurship and Born Globals to develop further, we need to know more about the continued internationalisation of these firms (Liesch et al., 2007). Second, because international entrepreneurship research is lacking notions from international business theories (Young et al., 2003), such theories are needed to broaden the scope of the research field. This study contributes to international entrepreneurship research by integrating concepts and dynamic views from knowledge-based internationalisation process theory (Johanson and Vahlne, 1977) with international entrepreneurship research.

The article is structured as follows: a theoretical framework discussing the results from previous research studies about internationalisation and Born Globals follows the introduction. Next, the methodology of the study is discussed, followed by the presentation and analysis of case study data. The article then offers a discussion of the findings and limitations, as well as suggestions for further research.

Theoretical framework

Knowledge-based internationalisation process theory

Knowledge-based internationalisation process theory emphasises the dynamic nature of a company's operations in foreign markets (Johanson and Vahlne, 1977). According to process theory, the main mechanism behind a company's change in internationalisation mode is its development of knowledge about foreign markets. By initiating operations in a foreign market, an internationalising company develops experience of operating in that market. This experience is based on a company's interactions within foreign business relationships, such as relationships with foreign customers, suppliers, and competitors (Blomstermo et al., 2004). In its interaction within these relationships, a company develops

experiential knowledge of foreign markets, which, in turn, influences the company's perceptions of the costs, risks, and benefits of operating in the specific foreign market.

Knowledge-based internationalisation process theory has provided a dynamic perspective on the internationalisation modes that companies use in their internationalisation process. The theoretical arguments of this theory are based on empirical observations of the foreign operations of Swedish multinationals (Johanson and Wiedersheim-Paul, 1975). These observations demonstrated an incremental development in the modes used by companies at different points in time during their international expansion. Johanson and Wiedersheim-Paul (1975), moreover, showed that there is an incremental increase in a company's resource commitments to a specific foreign market. The increasing resource commitments, in turn, reflect the company's increased foreign market knowledge that is acquired whilst working in accordance with the different internationalisation modes. The central argument in knowledge-based internationalisation process theory is, therefore, that as companies acquire more experiential knowledge of foreign markets, they are able to progress to other modes of internationalisation that require increased resource commitments. In accordance with existing research, internationalisation modes can be distinguished amongst direct exporting, exporting via foreign intermediaries, licensing and franchising, strategic alliances/joint ventures, and sales and/or manufacturing subsidiaries (Agnadal and Chetty, 2007; Pedersen and Petersen, 1998). These modes differ in the resource commitments they require from a company. In line with previous studies (Erramilli and Rao, 1990; Johanson and Wiedersheim-Paul, 1975), we categorise exporting modes (including licensing and franchising) as low commitment internationalisation modes, whereas strategic alliances, joint ventures, and subsidiaries are categorised as high commitment internationalisation modes.

International entrepreneurship research

Born Globals are companies that begin operating in several foreign markets from inception or soon thereafter. Studies have shown that these companies simultaneously use multiple and different modes of internationalisation (Andersson and Wictor, 2003; McDougall et al., 2003; Sharma and Blomstermo, 2003). Sharma and Blomstermo (2003) argued that entry into a large number of foreign markets using a variety of different entry modes can open up new opportunities for continued internationalisation for the firms. As indicated by the studies reviewed in Table 1, most Born Global studies have analysed only the initial entry modes used by these firms in foreign markets. The few studies that have touched upon the continued internationalisation modes used by Born Globals have indicated that these firms tend to increase their resource commitments and establish high commitment modes (Jones, 1999; Sharma and Blomstermo, 2003). It has, moreover, been argued that Born Globals are flexible in their internationalisation modes used (Rialp et al., 2005) and adapt their internationalisation modes to the needs of the individual market and clients (Sharma and Blomstermo, 2003). These arguments indicate that Born Globals do not display one specific pattern in their use of

Table 1 Internationalisation modes used by Born Globals and high-tech SMEs.

Author	Type of firms	Initial internationalisation modes used	Continued internationalisation modes used
Bell (1995)	High-tech SMEs	Multiple and different modes used; dominated by low commitment modes	No or few changes made; low commitment modes still dominated
Jones (1999)	High-tech SMEs, including international entrepreneurs	(For the international entrepreneurs): Multiple and different modes used; including both low and high commitment modes	(For the international entrepreneurs): Investments made in high commitment modes
Crick and Jones (2000)	High-tech SMEs	Multiple and different modes used; dominated by low commitment modes	Investments made in high commitment modes in core markets
Shrader et al. (2000)	International new ventures	Multiple and different modes used; including both low and high commitment modes	Not analysed
Andersson and Wictor (2003)	Born Globals	Multiple and different modes used; including both low and high commitment modes	Not analysed
McDougall et al. (2003)	International new ventures	Multiple modes used	Not analysed
Sharma and Blomstermo (2003)	Born Globals	Multiple and different modes used	Incremental investments made in high commitment modes
Crick and Spence (2005)	High-tech SMEs	Different modes used; dominated by low commitment modes	Different patterns found; no change in modes, investments made in high commitment modes, change from high to low commitment modes

internationalisation modes during their internationalisation process.

Firms that have been previously conceptualised as high-tech small and medium-sized enterprises (SMEs) are similar to many Born Globals. Both Born Globals and high-tech SMEs have been shown to operate in dynamic markets where market conditions change rapidly; thus, these firms are required to adapt rapidly to new foreign market conditions, especially during their internationalisation (Crick and Jones, 2000; Crick and Spence, 2005; Rialp et al., 2005). Contrary to Born Global studies that have not shown whether changes in market conditions require changes in internationalisation modes, previous studies of high-tech SMEs have provided mixed results on the tendency of these firms to change modes in their continued internationalisation (see Table 1). Whereas some high-tech SMEs increase their resource commitments in the form of investments in high commitment modes (Crick and Jones, 2000), others demonstrate an opposite behaviour (Crick and Spence, 2005), and still other firms show no change in the internationalisation modes used in their continued internationalisation processes (Bell, 1995).

Integrating two theoretical perspectives

Knowledge-based internationalisation process theory and entrepreneurship research differ in their focus and arguments regarding the internationalisation modes used in firms' internationalisation. Knowledge-based theory has fo-

cused on firms' incremental change of internationalisation modes. In contrast, international entrepreneurship research has concentrated on the existence of Born Globals and their initial internationalisation modes but has paid less attention to the continued internationalisation of these firms (see Figure 1).

In comparison to the knowledge-based emphasis of a dynamic perspective, international entrepreneurship research has employed a more static perspective when investigating the internationalisation modes that firms use. Given this difference of focus, the two theoretical perspectives differ in their views on the resource commitments made by firms during their internationalisation processes. Whereas knowledge-based theory emphasises an incremental increase in resource commitments in foreign markets over time, international entrepreneurship research provides evidence of a more rapid increase in resource commitments that have already occurred during the initial internationalisation. According to knowledge-based theory, firms experience an incremental development in the modes used during the internationalisation process because a change from low to high commitment modes requires foreign market knowledge. On a similar note, studies in international entrepreneurship have indicated that foreign market knowledge is critical in the internationalisation of these firms (Yli-Renko et al., 2002) and that foreign customer knowledge specifically influences the international success of Born Globals (Knight et al., 2004).

Because the aim of this study is to explore which internationalisation modes Born Globals use during their initial and

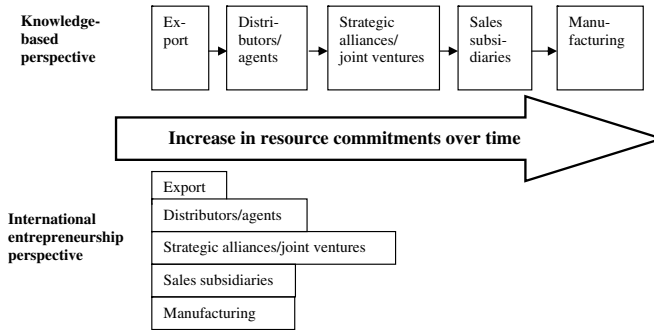


Figure 1 The theoretical perspectives.

Table 2 Definitions of key concepts used in this study.

High commitment internationalisation modes	Strategic alliances, joint ventures, and subsidiaries
Low commitment internationalisation modes	Exporting modes (including licensing and franchising)
Foreign customers	The end users of a company's products (i.e., the customer organisations that use the company's products in the end)
Foreign customer knowledge	Experiential knowledge about the characteristics of foreign customers and ways to interact with these types of customers, as well as knowledge about foreign customers' needs, demands, and problem-solving approaches

continued internationalisation, we find that the dynamic perspective of the knowledge-based theory can contribute useful insights into international entrepreneurship research. Thus, integrating these two theoretical perspectives may reveal a relationship between the internationalisation modes used by Born Globals and their development of foreign customer knowledge. In doing so, further insights into and an understanding of Born Globals' continued internationalisation behaviour could be gained. We define foreign customer knowledge as experiential knowledge about the characteristics of foreign customers and ways to interact with these types of customers, as well as knowledge about foreign customers' needs, demands, and problem-solving approaches. The definitions of key concepts used in this study are presented in Table 2.

Research method

To fulfil the purpose of this study, we adopted a qualitative case study approach. Because we want to investigate context-specific phenomena, qualitative data are appropriate in this type of study. By employing a case study approach, we can, moreover, derive new theory from the data (Eisenhardt, 1989).

The case companies

Previous studies have argued that biotechnology is a set of technologies used in various fields and, therefore, cannot be regarded as an industry per se (Renko et al., 2005). In this study, we chose to use the Swedish biotechnology field as an empirical starting point for exploring the internation-

alisation of Born Globals because, in most cases, companies within the biotechnology field can be considered truly global (Brännback et al., 2007).

We selected the case companies from 'The Swedish Biotech Industry Guide', a database that lists and offers information about the majority of companies in the Swedish biotechnology field. We chose to focus on the biotechnology cluster in the Swedish city of Uppsala because the Uppsala cluster comprises about one fourth of Sweden's biotechnology field-in the form of two universities and three large national research agencies, as well as several large pharmaceutical groups and SMEs. Another advantage of this cluster is its geographical proximity to Stockholm, where many of Sweden's largest venture capital investment companies are located. In relative terms, Uppsala has, furthermore, been described as one of the most biotechnology-intensive cities in the world (Waxell and Malmberg, 2007). Its concentration of a multitude of interesting organisations in such a comparatively small area facilitated data collection by providing easy and continuous access to interviewees.

In addition to being part of the Uppsala biotechnology cluster, potential case firms had to satisfy the following criteria: (1) fulfil the definition of an SME, (2) continue to employ their founders, (3) conduct their own research and development (R&D), and (4) have sold at least one product in a foreign (i.e., non-Swedish) market. These criteria were chosen so that we could find internationally active firms that are capable of managing the production chain themselves-from R&D to the interaction with foreign actors. Because the founders of small entrepreneurial enterprises have often been shown to play important roles in the firms'

Table 3 The Born Globals in 2003.

Company	Develops and sells	Number of staff in 2003	Turnover in 2003 (thousands of USD)	Net profit/loss in 2003 (thousands of USD)
A	High-quality biochemicals for the life science industry	10	1076	123
B	Products within the area of biological control and plant growth stimulation	13	922	-1091
C	Microsystems for the life science industry	29	2012	-2725
D	Ready-made adjuvants for animal vaccine development	7	933	-516
E	Diagnostic products within the area of veterinary medicine and food safety	25	2450	-494
F	New drugs and dosage forms for improved drug treatment	19	2756	-3075
G	Microfluidic solutions for the life science industry	70	639	-28,048
H	Products for genetic analysis in clinical research	90	11,950	-24,256

first years of internationalisation (Rialp et al., 2005), we also wanted the founders to be still active in the firms.

We chose to contact qualified candidate case companies randomly. All of the companies that we subsequently contacted agreed to participate in the study, and data collection was halted after 14 companies had been visited. Because the interviews conducted at the last few companies provided us with narratives similar to those we had previously heard, the theoretical saturation point seemed to have been reached. New insights into the subject of biotechnology companies' internationalisation were no longer gained and, therefore, had been substantially explained. Reaching the theoretical saturation point also indicated that it was unlikely that we would obtain an incremental improvement of theory if we were to continue investigating more companies (Eisenhardt, 1989).

Of the 14 companies under study, only the eight companies that satisfied the Born Global criteria were included in this study. Table 3 provides information about the Born Global companies when the study was started in 2003. Tables 4 and 5 show that these eight companies fit into the commonly used operationalisation that views Born Globals 'as firms less than 20 years old that internationalised on average within three years of founding and generate at least 25% of total sales from abroad' (Knight et al., 2004, p. 649). Of the six companies that were excluded, one was

too old (22 years) to be considered a Born Global, and the remaining five companies had their first international sale more than three years after their inception (4 years, 4 years, 8 years, 10 years, and 13 years).

Data collection

In this study, we considered the individual biotechnology companies to be the units of analysis. To investigate their international development, we chose to conduct interviews with the founders and managers who had been most responsible for managing the companies' internationalisation.

Between January 2003 and June 2005, 33 face-to-face, semistructured interviews were conducted with the founders and managers at the eight companies. The duration of the interviews ranged from 40 to 160 min per interview. Between June 2005 and April 2008, we continued to follow the development of these companies by collecting secondary data and conducting phone interviews with respondents.

A major strength of a case study data collection is the opportunity to use different sources of evidence (Creswell, 2003; Yin, 2003). Multiple sources of evidence are also particularly important in terms of strengthening the construct validity. The quality of empirical research in this explor-

Table 4 The Born Globals.

Company	Business area	Founded	Year of first foreign sale	Main source of funding	Number of interviews
A	Industrial biotechnology	1995	1995/1996	Family-owned	5
B	Agrobiotechnology	1996	1998	Farming and food industry group	1
C	Diagnostics	1998	1999	Venture capital company	11
D	Pharmaceuticals	1999	1999/2000	Private investors	2
E	Diagnostics	2001	2001/2002	Foundation	4
F	Pharmaceuticals	1995	1997	Venture capital company	1
G	Life sciences suppliers/manufacturers	2000	2000/2001	Venture capital company	5
H	Life sciences suppliers/manufacturers	1997	1999/2000	Venture capital company	4

Table 5 The Born Globals' internationalisation.

Company	Export percentage (compared to total sales)	Foreign market entries since foundation (regions of the world)	Nature of important value-creating activities in foreign markets
A	28% (within 3 years after foundation)	Europe, North America, South America, Asia, Africa, Oceania	Marketing and distribution
B	30% (within 10 years after foundation)	Europe	Production, marketing and distribution
C	70% (within 6 years after foundation)	Europe, North America	No important value-creating activities in foreign markets
D	98% (within 3 years after foundation)	Europe, North America, South America, Asia, Oceania	R&D and marketing
E	90% (within 3 years after foundation)	Europe, North America, South America, Asia, Africa, Oceania	R&D, marketing and distribution
F	100% (within 3 years after foundation)	Europe, Asia	Marketing and distribution
G	80% (within 3 years after foundation)	Europe, North America	Marketing and distribution
H	85% (within 3 years after foundation)	Europe, North America, South America, Asia, Africa, Oceania	R&D, production, marketing and distribution

Note: We see the most important value-creating activities as the key aspects of the value chain, namely research and development (R&D) activities, production, as well as marketing and distribution (Jones, 1999).

ative study was measured only in terms of construct validity, reliability, and external validity because internal validity is a concern only in causal (or explanatory) case studies (Yin, 2003).

In addition to conducting semistructured interviews with different employees at most of the sites, we used archival documentation from the companies and information collected from databases, such as master's theses, news articles, and annual reports. We also established evidence chains and found that the documentary evidence corroborated with the stories provided by the different founders and managers. Another test was to receive feedback on drafts of the cases from the interviewees.

To strengthen the external validity of our multiple case studies, we followed experiment-like replication logic when collecting the data (Yin, 2003). Even though our interviews were semistructured, the respondents were given the opportunity to speak freely and to elaborate on their answers. To ensure that the same topics were covered at all of the companies, we utilised an interview guide.

To increase the reliability of the study, we kept a detailed account of our activities in a research protocol, which included transcripts of the audiotape recordings from all of the interviews, transcripts of our field notes and observations, and transcripts of the secondary data. Because the goal of reliability is to minimise errors and biases in a study, we enlisted two researchers to conduct the interviews at the investigated companies.

Cross-case analysis

To analyse the data from the eight case studies, we used cross-case synthesis. This technique treats each individual case as a separate study, and the analysis can reveal both similarities and differences (Yin, 2003). Based on an extensive empirical comparison of the eight cases, we determined that they could be divided into three groups based

on the internationalisation modes that they used during their internationalisation. The first group comprises the *low committers*, which used low commitment internationalisation modes to begin their internationalisation and to commence their continued internationalisation process. The second group consists of the *incremental committers*, which began their internationalisation using low commitment internationalisation modes but changed internationalisation modes in some markets during their continued internationalisation. The third group of Born Globals is the *high committers*, which began their internationalisation using both high commitment and low commitment internationalisation modes and changed modes during their continued internationalisation.

The cross-case analysis was based on indepth descriptions of the international development of one case from each of the three groups of low, incremental, and high committers. Because the firms in each group internationalised in a similar manner, these three case firms will represent the other firms in the same group. We chose the cases of companies A, E, and G because they were the firms that can best illuminate the points that this analysis seeks to make. Examples of changes in foreign market commitment in all of the case companies are presented in Table 6.

An example of a low committer: company A

Company A, which was established in the mid-1990s, possesses a product portfolio of over 200 products, including different enzymes, proteins, and user-friendly analytical kits. Company A's main customers are well-established biotechnology companies as well as smaller clinics all around the world. Because company A's products are considered to be user-friendly, most of them can be ordered by e-mail and telephone, and most customers know how to use these products without requiring any further interaction with company A. As a consequence, the company can manage

Table 6 The Born Globals' main internationalisation modes.

Company	Direct export (2003)	Exports via independent representatives (2003)	Establishment of local sales subsidiaries (2003)	Establishment of local manufacturing subsidiaries (2003)	Examples of changes in foreign market commitment during the continued internationalisation (2003–2008)
A	Yes	Yes (Switzerland)	No	No	Expands exports to several new markets; starts up new product-development project with German company
B	Yes (Norway and Austria)	Yes (Finland)	No	No	In 2004, company B receives approval to sell its products in the European market; as a consequence, company B expands exports to Denmark, Switzerland, Poland, Lithuania, and Italy
C	Yes	No	No	No	Enters into collaborator agreements with several foreign diagnostic companies
D	Yes	No	No	No	Enters into distribution agreement with Japanese distributor; enters into a product-development project with Dutch company and a research collaboration project with a Swiss company
E	Yes	Yes	No	No	Enters into strategic alliance with German company
F	Yes	Yes	No	No	Enters into joint venture agreement with British pharmaceutical company; the joint venture will manage the marketing and distribution of both companies in the Nordic countries (Norway, Sweden, Finland, Denmark, and Iceland)
G	Yes	Yes	Owns sales subsidiaries in the USA, the UK, and Germany	No	Closes sales subsidiaries in the UK and Germany
H	Yes	Yes	Owns sales subsidiaries in the USA, the UK, Germany, France, and the Benelux countries	No	Opens sales subsidiaries in Switzerland, Italy, and Japan; buys firm with manufacturing unit in the USA

the majority of its sales from its headquarters in Uppsala. Company A also uses a distributor of its products in the Swiss market.

When asked about which obstacles company A has encountered during the company's internationalisation, the founder remarked, 'I have generally never noticed any obstacles, but I do not know if this is because I don't have to meet our foreign customers personally.... The contact is mostly handled via e-mail' (Excerpt from interview 11/04/2003). Even though most of the contact with foreign customers is managed without much interaction, some customers do have questions that need to be addressed (e.g., concerning the expected results from using certain products). When the study was started in 2003, Germany was company A's third largest export market. In some cases, company A also co-developed products with its German customers. The higher level of contact that this required revealed the existence of a language barrier between company A and its German customers. The founder stated that 'Most of the time it is hard to understand the customer

because of language difficulties. There are a lot of technical terms, and we have a hard time finding the right words for these' (Excerpt from interview 11/11/2003).

A student from Germany was engaged to help with the sale of company A's products to the German market in an effort to overcome the language barrier that existed when dealing with the German customers. Her responsibilities included creating product information materials in German and communicating with the German customers. She commented, 'When I started here, there was no existing marketing department.... Until I started, it has always been the customers who contact us' (Excerpt from interview 05/04/2004). With the addition of the German student, the founder noticed a change amongst the German customers, who 'turned to us and asked us why we try to speak English when we can speak German. It has been very much appreciated that we now can communicate in German' (Excerpt from interview 11/11/2003).

During its continued internationalisation, company A continues to export to new markets. It is, however, still most

often the foreign customers who contact company A-not the other way around. Company A generates about 10–20 new foreign customers yearly via their homepage. Many of these customers discover company A whilst searching for the names of the company's products on the Internet.

Because company A is not physically present in foreign markets and its interaction with foreign customers is limited, the company experiences difficulties in developing foreign customer knowledge. Even though company A is constantly expanding its exports into new markets and has customers all over the world, its use of internationalisation modes has not substantially changed during its continued internationalisation. The company, however, is moving towards increasing its commitment of resources to the German market. For example, it started a new collaborative product-development project with a German diagnostics company in 2007. The company's Web shop is, moreover, continuously updated with features (e.g., product information in German), thus making it easier for foreign customers to buy products via the Web. Since the beginning of this study in 2003, the company has been profitable every year. As evident from the founder's following statement, the company's strategic intent was never to increase dramatically its foreign market commitment during its internationalisation: 'I do not feel any need to make the company into a large company with subsidiaries abroad' (Excerpt from interview 11/04/2003).

Similar to company A, the other low committers have also increased their presence in foreign markets during their continued internationalisation. For example, company B expanded its exports into five new foreign markets between 2003 and 2008. Companies C and D have also taken additional steps towards increased market commitment in specific markets (see Table 6). However, none of the low committers have changed to higher committed internationalisation modes during their continued internationalisation; they instead continue to focus on direct exports.

An example of an incremental committer: company E

Company E, which was established in its present form at the beginning of 2001, develops, manufactures, and sells diagnostic products within the areas of veterinary medicine and food safety. In its portfolio, company E has about 30 products that it sells to large-scale laboratories as well as to clinical and practical veterinarians. Because company E's products are easy for customers to use, the company can start its internationalisation mainly through direct export, as well as via distributors or agents that act as bridges to foreign customers. Company E's use of distributors is extensive; as a result, it has developed a distributor network that covers more than 80 countries all over the world. Because company E has indirect relationships with most of the end users of its products, it does not commit vast amounts of resources to support its direct relationships with these end users. Company E's CEO described the situation as follows:

Many of our products are so well known that the customer does not need too much information before testing the products. In these cases our sellers do not have

to visit companies to demonstrate how the product works. If the customer, on the other hand, has problems with their products, it is important that the distributor has the technical knowledge to help the customer. (Excerpt from interview 02/04/2003)

Even though company E's direct interactions with the end users of its products are not frequent, it invests resources in the form of time and capital to market the company to its distributors in foreign markets. Company E's product manager described the company's marketing approach as follows: 'Our marketing department has lately become more eager to perform follow-up activities with distributors since [the new CEO] started. The follow-up activities consist of, amongst other things, regular visits to the distributor companies (Excerpt from interview 05/06/2003).

One of the goals of company E's marketing department is to meet distributor companies in the most important key markets in person at least once a year. It is important for company E to maintain a continuous relationship with its distributors because it is competing with numerous other suppliers for the attention of these distributors. Maintaining direct contact with distributors is also important as a means of gaining knowledge about the business climate, bureaucracy, laws, and norms in different foreign markets. The CEO of company E explained that distributors 'provide us with this [knowledge about the business climate, bureaucracy, laws, and norms] information. Direct presence in the market is often demanded to acquire this knowledge' (Excerpt from interview 05/06/2003).

Because company E usually does not interact directly with its foreign customers and has a limited physical presence in foreign markets, it is difficult for the company to develop experiential knowledge about its foreign customers. Company E instead interacts more frequently with its foreign distributors. In doing so, the firm develops experiential knowledge about its foreign distributors and their knowledge about the foreign market and the end users in that market. Even though company E is focused on improving its relationships with distributors, the choice of using distributors for international sales is not considered an optimal strategy. One particularly negative effect of using distributors is that company E must relinquish part of its profits in the form of distributor discounts. The distributor system also demands a great deal of attention from company E's marketing department. The CEO envisioned that company E's reliance on distributors may possibly change in the future:

If we in the future can manage without distributors, we would probably open a European sales organisation with two employees that would cover the whole European market. This would not imply that we had our own sales organisations in every country. There are, however, no immediate plans for the introduction of a European sales organisation. (Excerpt from interview 02/04/2003)

In contrast to the low committers, company E committed incrementally more resources to foreign markets between 2003 and 2008. When the study was started in 2003, company E relied heavily on its interaction with foreign distributors to market its products abroad. In 2005, company E began generating a profit. By entering into a strategic alliance with a German SME in 2007, company E took a big step

towards greater commitment to the German market. Through the sharing of product portfolios, these two companies have joined forces in international sales and marketing. The German company handles the German and Benelux market, whereas company E handles the worldwide market, mainly by using its existing distributor network. Even though the strategic alliance does not facilitate direct interaction with the German customers, it increases company E's commitment to the German market.

In many respects, the other incremental committer, company F, has developed similarly to company E. In its sales efforts, the company does not turn to the end users of its products but instead seeks to reach licensing agreements with certain partners and distributors. In 2007, company F entered into a joint venture agreement with a larger British pharmaceutical company (see Table 6). This joint venture agreement can be viewed as an effort to increase company F's presence in the Nordic markets. In addition, company F's market commitment represents a step towards developing its relationships with customers in these markets.

An example of a high committer: company G

Company G, which was established in 2000, sells microfluidic solutions for the life sciences industry. The equipment and services that the company sells are based on new technology that helps researchers within the life sciences industry to generate data more efficiently. The technology on which company G builds was previously developed by one of the large pharmaceutical groups situated in Uppsala. Company G, which was established as a spin-off from this group, received financial support from the parent group, as well as large investments from different venture capitalist firms. Company G used a vast portion of the investments to promote rapid and high-committed internationalisation in certain important markets. One year after company G was formed and before it even had any products ready to sell its first foreign sales subsidiary was established in the United Kingdom. The CEO described company G's plans for internationalisation as follows:

The management group agreed that we should be in the market 12–18 months before the sales would start... You have to show what you can do with the technology before a company wants to buy a product that it does not know that it needs. From our perspective, this was also a period which gave feedback about the [market's] need for the product. (Excerpt from interview 07/02/2003)

Because company G's products are based on new technology, close proximity to its customers is required to convince them that its products work. It is also important for company G to receive instant feedback from its customers regarding the products' features so that company G can immediately offer help should the need arise.

In company G's second year, two additional sales subsidiaries were established, one in the United States and the other in Germany. In all three foreign sales subsidiaries, the sales staffs were recruited locally. Company G's management team believed that the recruitment of a local sales staff would help the company to increase its knowledge about cultural differences and to gain access to local customers.

Even though company G committed considerable resources to its most important markets, distributors were still used in markets that were regarded as less important. Company G's vice president (VP) of marketing stated the following:

A first link to new customers goes via distributors in the markets where we do not need our own sales subsidiaries. The distributors are, however, responsible for a lot of products and do not possess the same level of knowledge as our own sellers. Our sellers can go in and take an active role in the situations where the distributors, for example, need support to handle the end users. (Excerpt from interview 10/03/2003)

During its initial internationalisation, company G demonstrated a need to be physically present in its most important foreign markets to allow market penetration and frequent customer interaction to occur. In those cases where distributors were used, company G took an active role in enabling support to the end users of its products. Company G, thus, perceived a need to develop experiential knowledge of its foreign customers. The high commitment modes that the company used in its initial internationalisation facilitated the firm's development of foreign customer knowledge by enabling direct interaction with foreign customers and its own physical presence in foreign markets. However, the considerable resource commitment involved in establishing and maintaining its foreign customer relationships was costly. A large amount of venture capital was thus required from the outset.

During its continued internationalisation, company G's sales have not increased sufficiently, and the company has incurred losses. In an effort to reduce losses, the company's sales subsidiaries in the United Kingdom and Germany were phased out in 2007. However, its sales organisations in the United States and Sweden are being expanded. In addition, a greater number of distributors are being used to cover other markets. By implementing these changes, company G has decreased its resource commitments to relationships with its customers in the United Kingdom and Germany whilst increasing its resource commitments to relationships with its American customers.

Company H, the other high committer in the sample, experienced a rapid and high market commitment process during its initial internationalisation similar to that of company G. As a result of buying two other companies at the end of 2003, company H is in a position where it can restructure its product focus and create synergetic effects in its foreign marketing and sales. By 2007, company H increased its market commitment to new markets by opening sales subsidiaries in Switzerland, Italy, and Japan.

Concluding discussion

The purpose of this study was to explore which internationalisation modes Born Globals use during their initial and continued internationalisation. Three broad patterns of internationalisation behaviours were identified amongst the eight Born Globals under investigation. These patterns differ in terms of the Born Globals' level of resource commitments to foreign markets.

To begin their internationalisation, the *low committers* (companies A, B, C, and D) used low commitment internationalisation modes, such as direct export modes. Even though the low committers have increased their resource commitments to foreign markets, they have not engaged in high commitment modes or changed internationalisation modes during their internationalisation. These companies also perceive themselves as being on the right track and do not plan to make any higher commitments, such as establishing sales subsidiaries in foreign markets.

The *incremental committers* (companies E and F) also began their internationalisation using low commitment internationalisation modes. These companies' interactions with foreign customers are predominantly managed by their foreign distributors. In contrast to the low committers, the incremental committers change internationalisation modes in some markets during their continued internationalisation. By establishing relationships with foreign business partners (e.g., company D's strategic alliance with the German company; company E's joint venture with the British company), they increase their commitment to these specific markets.

The *high committers* (companies G and H) began their internationalisation by using high commitment internationalisation modes in their most important foreign markets and low commitment modes in less important foreign markets. These firms place great importance on being in close proximity to their most important foreign customers and on receiving instant feedback about the company's products. The changes made in the high committers' continued internationalisation, however, point to two different paths: (1) a continued increase in resource commitments and use of high commitment internationalisation modes (e.g., company H) and (2) a decrease in resource commitments demonstrated in the liquidation of high commitment internationalisation modes, such as foreign subsidiaries (e.g., company G).

In this study, we have contributed to international entrepreneurship research by exploring the continued internationalisation behaviours of Born Globals. By identifying three patterns of internationalisation behaviours, our findings support the argument made by Sharma and Blomstermo (2003) that there is no predetermined blueprint for Born Globals to follow in their internationalisation. The basis for the three patterns of internationalisation behaviours exhibited by Born Globals in this study is the difference in their use of internationalisation modes. This finding also supports the results presented in previous studies of high-tech SMEs,

which have demonstrated a great variety in the modes that these firms use during their internationalisation process (Bell, 1995; Crick and Jones, 2000). Interestingly, the high committers were the only group of Born Globals in our sample that started their internationalisation by simultaneously using multiple internationalisation modes, including both low and high commitment modes, thereby supporting the dominant view presented in existing Born Global research (Andersson and Wictor, 2003; McDougall et al., 2003). By contrast, the internationalisation behaviours exhibited by the other two groups of Born Globals are in accordance with the view expressed in knowledge-based internationalisation process theory. These firms started their internationalisation using low commitment modes and-as evident in the case of the incremental committers-then incrementally increased their resource commitments during their continued internationalisation. Figure 2 shows the three groups of Born Globals and the internationalisation modes used in their continued internationalisation.

Our findings suggest that integrating knowledge-based internationalisation process theory and international entrepreneurship research can enhance the understanding of Born Globals' continued internationalisation. The dynamic perspective on firms' internationalisation modes presented in knowledge-based theory contributes to international entrepreneurship's more static view. An integration of these two theoretical perspectives is, therefore, highly relevant when the aim is to understand the changes in resource commitments exhibited by different groups of Born Globals during their continued internationalisation. High committers, for example, make substantial resource commitments to foreign markets in their initial internationalisation process. However, in their continued internationalisation, we found evidence that these companies decrease their resource commitments. Therefore, it seems that a rapid increase in resource commitments during the initial internationalisation processes of these firms is not necessarily followed by a further increase in resource commitments during their continued internationalisation processes. Similar behaviour has been identified by Crick and Spence (2005) in their study of the internationalisation of high-tech SMEs. Moreover, the low committers have not made any significant resource commitments during their continued internationalisation. Despite the fact that the low committers have been operating abroad for approximately a decade (9–13 years), these companies still use low commitment internationalisation

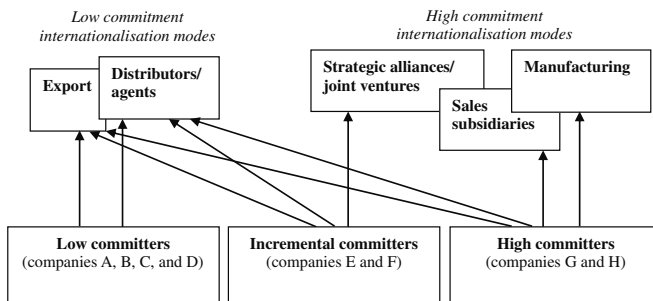


Figure 2 The three groups of Born Globals in their continued internationalisation.

modes (e.g., engage in direct export and/or depend on distributors to reach their most important foreign markets) in 2008. These firms, therefore, demonstrate a comparatively slow pace of resource commitments made to foreign markets. In contrast to the other two groups of Born Globals, the incremental committers are those firms that have incrementally increased their resource commitments to foreign markets throughout their initial and continued internationalisation. As previously mentioned, this group of firms is the one that most clearly follows the dynamic internationalisation pattern suggested in the knowledge-based theory. In summary, we found that the speed at which resources are committed to foreign market operations varied greatly amongst these three groups of Born Globals.

Within international entrepreneurship research, Born Globals have stood out as examples of firms that achieve rapid internationalisation almost from the moment of their inception. The importance of speed for the international success of Born Globals has been a dominant view amongst Born Global scholars (Rialp et al., 2005). Born Globals are commonly defined as those firms that experience rapid internationalisation (i.e., initiate operations in several foreign markets within three years of founding and generate at least 25% of total sales from abroad) (Knight et al., 2004). However, in this study, we demonstrated that rapid initial internationalisation does not necessarily result in rapid continued internationalisation. In terms of the level of resource commitment, we also showed that the pace of internationalisation of one group of Born Globals changes during the course of its internationalisation: Its initial internationalisation developed rapidly, but its continued internationalisation has occurred slowly. The findings of this study, therefore, suggest that to understand the speed of internationalisation amongst Born Globals, research must, to a much greater extent, take these firms' continued internationalisation into consideration. To include only their initial internationalisation behaviour in the analysis provides limited understanding into the speed of internationalisation.

In addition to facilitating the study of the continued internationalisation of Born Globals, the integration of perspectives from knowledge-based theory and international entrepreneurship research contributes important insights into Born Globals' development of foreign customer knowledge. As shown in this study, differences in internationalisation modes used and resources committed amongst the firms under investigation are related to their development of foreign customer knowledge. The low commitment modes that the low and incremental committers used in their initial internationalisation made it more difficult for these firms to develop experiential knowledge about their foreign customers. By not making any changes in internationalisation modes during their continued internationalisation, the low committers did not facilitate their foreign customer knowledge development substantially. In comparison, the incremental committers changed internationalisation modes during their continued internationalisation and, thus, increased their possibilities of developing foreign customer knowledge by intensifying their relationships with foreign business partners. In contrast to the other two groups, the high committers used high commitment modes during their initial internationalisation, which enhanced their development of foreign customer knowledge. During

their continued internationalisation, the high committers showed different behaviours—one firm increased its resource commitments, whereas the other firm showed a decrease in resource commitments to foreign markets, thus affecting the two firms' possibilities of developing foreign customer knowledge in different foreign markets.

Previous research studies investigating Born Globals have suggested that foreign customer knowledge is important for the international success of these firms (Knight et al., 2004). Although this study indicates that the differences in internationalisation modes used by different groups of Born Globals relate to differences in their development of foreign customer knowledge, the results do not clearly show that one particular group of firms is more internationally successful than the others. Thus, future research should pay more attention to the speed at which Born Globals develop foreign customer knowledge in both their initial and continued internationalisation processes. Two critical questions for future investigators are, therefore, to find out how some Born Globals are able to develop foreign customer knowledge more rapidly than other firms and how this foreign customer knowledge is related to international success. We believe such research could provide new insights into the significance of speed for the international success of Born Globals.

Limitations and suggestions for future research

For the purpose of this study, we chose a sample of Born Globals that operates within the biotechnology field. In doing so, our aim was not to identify the multitude of challenges that biotechnology companies face in comparison to companies in other business areas. Scholars interested in the biotechnology field have, for example, discussed the finding that the high costs of R&D (clinical trials, etc.) often make the development of new products a lengthy and costly endeavour (Renko et al., 2005). These high costs also make most biotechnology companies dependent on capital, which forces them to search for financial actors who are prepared to take risks and are willing to wait to see a return on their investment (Waxell and Malmberg, 2007). We believe that future studies investigating the influence of these and other challenges on the internationalisation modes and the acquisition of foreign market knowledge for biotechnology companies would be relevant for the future development of this research field.

The results of this study indicated that the different product offerings of these case companies influence their use of internationalisation modes and acquisition of foreign customer knowledge. We also identified a deficiency in knowledge-based internationalisation process theory as it lacks a discussion of the influence of product-related factors on companies' acquisition of foreign market knowledge. However, because of space limitations, we could not include an in-depth discussion about product-related factors and their influence on companies' internationalisation in this study. Based on the underlying assumptions of the transaction cost approach, scholars have demonstrated that product-related factors influence companies' use of overseas distribution channels (Anderson and Coughlan, 1987). Drawing on these findings, we believe that future research

should incorporate product-related factors into knowledge-based internationalisation process theory more thoroughly.

The case study approach is receiving greater scientific approval because it produces results with a high level of validity, from which generalisations can be drawn. However, the narrow scope of this study, which focused on a wide variety of Born Global case companies in one field of one cluster of one country, does not permit generalisations to be made based on our findings. Therefore, conducting quantitative studies in the future, from which generalisations can be derived, may prove useful.

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SARA MELÉN is currently undertaking a Ph.D. in marketing and international business at the Stockholm School of Economics. Her fields of specialisation include Born Globals' internationalisation processes, Born Globals' learning processes and their use of social capital.



EMILIA ROVIRA NORDMAN is currently undertaking a Ph.D. in marketing and international business at the Stockholm School of Economics. Her fields of specialisation include the effects of personal interaction on the internationalisation of SMEs and the internationalisation of Born Globals in the biotech field.

Paper 4

Face-to-Face interaction in an age of information - necessary or not?

Emilia Rovira

Published 2006 in *Managing Customer Relationships on the Internet*, (eds) A. Lindstrand, J. Johanson and D. D. Sharma, pp. 245-266, Elsevier Science, Oxford, UK.

Abstract

Born Global SMEs in high-tech businesses are generally known to use information technology to enable rapid internationalisation. IT communication may, however, not always be an adequate substitute for face-to-face interaction. This study investigates the role that face-to-face interaction with customers plays for Born Global SMEs in high-tech businesses. The results indicate that companies' levels of face-to-face interaction with customers relates to the levels of trust and uncertainty that customers feel about a business relationship. The inducement of customer trust and reduction of uncertainty is, furthermore, specifically important for companies that are in an exploration phase of their development.

Introduction

"History will pity the managers of the 1990s. The Internet touched down in their midst like a tornado, tearing up the old game book, disrupting every aspect of business, and compelling them to manage for a new economy." (Brown & Duguid, 2000: 1)

The emergence of Internet and information technology (IT) certainly changed the prerequisites for conducting business in a fundamental way. The new technology enabled companies to store, transmit and process information in a quicker and more efficient manner than before. In a global perspective Internet also emerged as a great equalizer, since it rolled back some of the constraints of location, scale, and time zones (Hill, 2001). The fact that Internet allowed companies to expand their global presence at a lower cost than ever before also changed the opportunities for resource constrained, small and medium-sized enterprises (SMEs)¹ to internationalise in a rapid manner.

Even though the use of information technology has doubtless proved to be a positive force in the daily operations of organisations, a rear view perspective sometimes shows that new technology, like IT-solutions, have not always conveyed the success that was expected from them (Mårtensson, 2000; Storey & Barnett, 2000). As a consequence of this, a vast number of researchers have started to discuss the importance of complementing pure-technology solutions with personal interaction (Nonaka, 1994; Malhotra, 1998; Malhotra, 2000; Soo *et al*, 2000). Personal interaction between individuals, like face-to-face communication, is, for instance, believed to be particularly necessary in business situations where feelings of uncertainty, ambiguity and risk are involved (Nohira & Eccles, 1992). Many researchers, furthermore, see a connection between face-to-face interaction and the evoking of trust in relationships

¹ The EU definition of SMEs that is currently in use is based on three criteria. The first criterion states that an SME is an enterprise with fewer than 250 employees. The second criterion states that an SME shall have an annual turnover that is no greater than ECU 40 million (about US\$ 49,3 million), or alternatively that its balance sheet total should be no higher than ECU 27 million (about US\$ 33,2 million). The third criterion states that an SME must be independent. An enterprise is considered as being independent unless 25 % or more of the capital or of the voting rights are owned by one enterprise falling outside the definition of an SME, or owned jointly by several such enterprises. (Szabo, 2003)

(Nohira & Eccles, 1992; O'Hara-Devereaux & Johansen, 1994; Handy, 1995; Hunter, 2000).

Even though Internet and information technology have created new opportunities for SMEs to internationalise in a rapid manner, these kinds of companies still face the challenge of balancing their communication with customers between the utilisation of IT communication and face-to-face interaction. The aim of this chapter is to investigate the role that face-to-face interaction with customers still plays for a particular kind of SME, namely Born Global² SMEs, which compete in high-tech markets. The study, more specifically, attempts to investigate the question of how face-to-face interaction influences the factors of trust and uncertainty in the relationships between Born Global SMEs and their customers.

Previous studies of Born Global SMEs indicate that these kinds of companies increasingly seem to utilise partners and networks in order to learn about and obtain access to foreign markets sooner (Saarenketo *et al*, 2004). This makes the relationships of Born Global SMEs and their international customers an interesting area to study. The main reason for choosing to base this study on Born Global SMEs in the high-tech business is that these kinds of companies face particularly interesting challenges in their interaction with customers. Since Born Global SMEs in the high-tech business must often operate on completely international markets almost directly from their start in order to survive, they are generally known to utilise information technology to a great extent, in order to communicate with their more remote customers. At the same time it is very important for these kinds of companies to be able to make their customers trust them, since they are often forced to convince their customers to take the risk of investing in brand new technology. The Born Global SMEs must find a way to reduce their customers' uncertainties about conducting business with small, new and, for them, often unknown enterprises.

Even though researchers such as Coviello and Munro (1997), Jones (1999), Crick & Jones (2000) and Saarenketo *et al* (2004) have contributed to research with studies that discuss the internationalisation of high-tech SMEs, no previous research has, to my knowledge, focused on how high-tech, Born Global SMEs' interact with international customers. As the number of Born Global SMEs grows, the need for knowledge and research about various aspects of these kinds of enterprises increases. By using empirical data from two Born Global SMEs in the Scandinavian biotech business, the study aims at contributing to the research area that investigates Born Global SMEs' business activities towards customers in international high-tech markets. Since the literature of Born Global firms is relatively new (Chetty & Campbell-Hunt, 2004), this study also endeavours to extend the empirical scope of Born Global literature.

The chapter opens with a presentation of the theoretical background that has been chosen in order to perform the study, after which the method is discussed. The characteristics of the companies that are to be investigated are treated, thereafter, and the empirical data is introduced and analysed. Finally a concluding discussion is presented.

² A Born Global is a firm that adopts an international or even global approach right from its birth or very shortly thereafter (Madsen & Servais, 1997).

Theoretical Review

The theories that are addressed in this chapter have been chosen in order to enable a discussion of how Born Global SMEs communicate with their customers in international high-tech markets. The first theories that are to be reviewed in this section of the paper discuss how the emergence of information technology has changed the prerequisites for the small companies' internationalisation processes, thus enabling the evolution of Born Global companies.

The Changed View of Internationalisation

The emergence of IT has certainly revolutionised the business world as we knew it. The Internet gives a majority of actors in business access to a tremendous wealth of information and contacts (Papows, 1998), as well as facilitating communication through new channels, namely via e-mail and other electronic procedures (Prescott & Slyke, 1997). As a consequence of these new possibilities, many researchers have started to notice the opportunities that information technology offers for small and middle-sized enterprises in particular. (Oviatt & McDougall, 1993; Coviello & Munro, 1997; Jones, 1999; Jeffcoate *et al*, 2000; Lituchy & Rail, 2000; Fernández Jurado & Bilbao Calabuig, 2001; Hill, 2001; Feindt *et al*, 2002). Researchers like Hill (2001), for example, argue that the Web has emerged as a great equaliser that allows both small and large businesses to expand their global presence at a lower cost than ever before (Hill, 2001). Information technology can, furthermore, be used to gather information about markets and competitors, and cut a company's communication costs. The utilisation of IT can also help an SME to sell products all around the world, thus becoming a mini-multinational company. (Fernández Jurado & Bilbao Calabuig, 2001)

As the emergence of IT enables even small and resource-constrained firms to internationalise, it has changed the old game book on international trade. This development of small firms' rapid internationalisation has also led researchers to abscond from traditional internationalisation models that describe internationalisation as an incremental process. The most commonly cited conceptual and empirical base for research, which argues that firms expand into international markets in incremental, stepwise manners, is Johanson and Vahlne's internationalisation process model from 1977 (Coviello & Munro, 1997). This model is based on behavioural theories of internationalisation.

Johanson and Vahlne (1977) suggest that a firm's initial internationalisation activities are targeted to psychologically close markets, i.e. markets that share a similar culture, language, political system, trade policy etc. to the internationalising company. This manner of international expansion poses a low risk for an internationalising firm, and enables it to learn about new markets and improve its foreign market knowledge. Over time and through experience, firms become able to increase their foreign market commitment and expand to more psychologically distant markets, thus conducting incremental internationalisation.

One study suggesting that traditional incremental internationalisation theories are unable to explain the internationalisation processes of SMEs is Lituchy and Rails article from 2000. They argue that Johanson and Vahlne's

internationalisation process model from 1977 no longer applies to small businesses, because of the improved communication systems, for instance Internet, that are in place today. Even though small businesses that used the Internet may have existed before the development of websites, they can, nevertheless, not have been considered to be the global start-ups there are today. Also Crick and Jones' (2000) study of small, high-tech firms repudiates the incremental approach. Crick and Jones argue that certain small firms, especially in the high-tech business, often possess the competence, capability, and experience that is needed to operate on distant international markets early in their development.

In accordance with Crick and Jones, Saarenketo *et al* (2004) argue that the internationalisation process of small high-technology firms often differs from the internationalisation process of more mature industries. They specifically point out that there is an increasing amount of evidence that many firms within high-tech industries do not follow the incremental paths to international markets. On the contrary, these companies aim at international markets from their very first day of existence. These kinds of companies can be considered to be Born Globals, and show very rapid and intensive international growth by the use of external resources such as partners and networks. Saarenketo *et al's* (2004) study indicates that firms increasingly seem to utilise more partners and networks and that this enables high-tech, Born Global SMEs, with limited resources, to learn about and reach foreign markets sooner.

The theoretical discussion of this study has hitherto indicated that the emergence of information technologies has developed the research area of internationalisation. Recent theories challenge traditional, incremental approaches to internationalisation, and remark that IT has enabled even small and resource-constrained companies to internationalise quickly. The literature discussed in the next section of this chapter addresses the limitations of IT utilisation and the importance of face-to-face interaction.

The Importance of Face-to-Face Interaction

"Marketing functions are performed under a hypermedia-computer-mediated-environment where interactivity and connectivity are replacing the traditional mode of "face to face negotiation" and communication. Internet allows interactivity between buyers and sellers to create a shared real time common marketplace. Connectivity links buyers-sellers worldwide creating a shared global market-space" (Khatibi, *et al*, 2003: 77)

The quotation above gives the impression that a problem no longer exists for even the smallest company to compete in international markets; that the world is an oyster for any company not afraid of participating in the hypermedia-computer-mediated-environment, and that face-to-face interaction between individuals can easily be replaced by other means of communication. But is this world-view really a good representation of reality? Many researchers beg to differ.

In a study about network organisations, Nohira & Eccles (1992) argue that an electronically mediated exchange can only substitute face-to-face interaction when the identities of the interactants are not very important. An electronically mediated

exchange should therefore only be used when the circumstances at hand are certain and unambiguous, and the actions necessary are standard and routine, and also when ongoing interaction does not depend on a robust structure of relationships. Nohira & Eccles (1992) also argue that face-to-face meetings are essential for forming the mental images of others that facilitate the development of a strategy for interacting with them. Strong feelings of like or dislike, trust or distrust, attraction or repulsion, and so forth are often formed in the first face-to-face interaction. Face-to-face communication therefore plays an essential role in establishing and maintaining the kind of multidimensional and robust relationships necessary for effective interaction and co-ordinated action, in situations of uncertainty, ambiguity and risk.

Apart from the research of Nohira & Eccles (1992), numerous additional studies have, over the years, been carried out in order to investigate what kind of communication ought to be most effective in different situations (Rice, 1992; Suh, 1998; D'Ambra *et al*, 1998; Roberts, 2000). Many of these studies have been based on the widely known and used media richness theory (Daft & Lengel, 1984, 1986). In the media richness theory, Daft & Lengel (1986) describe face-to-face interaction as the richest medium of communication. The reason that face-to-face interaction is the richest medium is because it provides immediate feedback, so that interpretation can be checked. Face-to-face interaction furthermore provides multiple cues via body language and tone of voice, and message content is expressed in natural language. The difference between rich media and media of lower richness is that rich media are personal and involve face-to-face contact between managers, while media of lower richness are impersonal and rely on rules, forms procedures, or data bases. (Daft & Lengel, 1986)

The theories above have indicated that face-to-face interaction is an important means of facilitating the communication between individuals. Previous research has, furthermore, emphasised that a connection exists between the utilisation of face-to-face interaction and the evoking of trust and reduction of uncertainty in relationships. The next section of this chapter will further discuss this area of research. The reason that the discussion of media choice consequences is limited to the subjects of trust and uncertainty in this study, is that the inducement of customer trust and reduction of uncertainty is instrumental for Born Global SMEs that compete in international high-tech markets. In order for customers to take the risk of investing in brand new technology, they must be able to trust that their suppliers can deliver what they have promised. Companies have to be able to reduce their customers' uncertainties in order to get the opportunity of doing business with them.

The Importance of Building Trust and Reducing Uncertainty

“Trust, though a rather elusive concept, is, however, highly important for the efficient operation of a knowledge-based economy, since the market exchange of knowledge gives rise to a high level of risk and uncertainty. These risks and uncertainties are reduced by the presence of a high level of trust” (Roberts, 2000: 433)

Even though the concept of trust is popular to use, there is no consensus about what the definition of trust is. There are, in fact, dozens of definitions of trust to be found

(McKnight *et al*, 2001-2002). For the purpose of this study, the commonly used trust definition by Moorman *et al* (1992) will be utilised, namely that trust is the willingness to rely on a business partner in whom one has confidence.

In their book from 1994, O'Hara-Devereaux & Johansen (1994) argue that face-to-face meetings are virtually irreplaceable for building interpersonal bonds between individuals. They argue, furthermore, that face-to-face interaction is very important for building trust in relationships. Voice-mail and video conferencing can provide ongoing support for maintaining trust because they convey some of the emotional context and interaction impossible in text only technologies like e-mail. Even so, face-to-face meetings are usually essential to establish trust in the first place. (O'Hara-Devereaux & Johansen, 1994)

Once trust has been established in a relationship it plays a central role in helping individuals overcome the perceptions of risk and insecurity (McKnight *et al*, 2002). Trust helps to reduce the uncertainty that individuals may feel. For the purpose of this chapter, Levine's (1997) definition of uncertainty will be used. Levine describes one sense of uncertainty to be that "I am uncertain when I think something is true about the world, especially the likely future shape of events, but acknowledge that I could be wrong" (Levine, 1997: 7)

The Reduction of Uncertainty through Information and Knowledge Means

In an article from 1994, Kollock introduces the dimensions of information and knowledge into the discussion of uncertainty. He argues that the lack of information about the motivations of others is the ground on which uncertainty is built. Sellers and buyers both face risks in an uncertain situation, but buyers face much greater risks because they are always in danger of being exploited by sellers because of their lack of knowledge about the quality of the goods being sold. (Kollock, 1994)

The discussion of information and knowledge will, for the purpose of this study, be limited to the effects that these two concepts have on the reduction of customer uncertainty. Information is defined as data within a context, where data are raw facts that can be shaped and formed to create information (Van Beveren, 2002). Knowledge, on the other hand, refers to an individual's personal stock of information, skills, experience, beliefs and memories (Alexander *et al*, 1991). Information becomes knowledge when it is acquired through the senses of an individual and processed in the human brain. During this processing of information new knowledge can be acquired or created for future use. (Van Beveren, 2002).

In accordance with Kollock, Shepherd & Zacharakis (2003) argue that knowledge decreases uncertainty. Knowledge represents the first stage in the decision making process and can help to decrease a customer's uncertainty regarding a specific product or service. In their article the authors discuss the concept of cognitive legitimacy, a concept that includes the uncertainty and ambiguity that is associated with a customer's purchase decisions. Shepherd & Zacharakis' (2003) study shows that the two factors that affect customers' cognitive legitimacy most is their knowledge of a supplier's product or management team. The less knowledge that a customer has about these two factors, the lower the level of cognitive legitimacy, and, therefore, the

less likely consumers are to purchase a new venture's market offerings. Another factor that influences customers' cognitive legitimacy is their knowledge about a supplier's organisation.

The theories above indicate that trust plays an important role for individuals in overcoming their uncertainties. Apart from trust, information and knowledge can help to decrease individuals' uncertainties about specific organisations, people, products or services. The next section of this chapter consists of a description of the method that has been used to gather information about the companies studied in this chapter. Thereafter follows a section that describes and analyses the firms studied.

Method and Data Collection

In this chapter, the case study method is used to investigate the international development of two Born Global SMEs in the Scandinavian biotech business. Case studies typically combine various forms of data collection methods (Eisenhardt, 1989), and before starting to gather qualitative data about the investigated companies, details about the companies were collected from databases, masters' theses and websites. This provided a broad description of the companies being studied. In order to investigate the companies further, in-depth interviews have been conducted with different employees, concerning the companies' creation and internationalisation. The interviews conducted were semi-structured, since I wanted to give the interviewees the opportunity to speak freely. According to Rubin & Rubin (1995), the semi-structured interview is also suitable when the understanding, knowledge and insights of the interviewee are of interest. Depending on what was said in the interviews, follow-up questions were asked. A questionnaire had, however, been prepared beforehand to make sure interesting and important facts were included in the interviews.

All of the interviews were conducted by two researchers, who were able to alternate the tasks of asking the questions and writing notes. This method gave one interviewer the perspective of personal interaction with the informant, while the notetaker retained a more distant view (Eisenhardt, 1989). According to Eisenhardt (1989), the use of multiple investigators may enhance the creative potential of a study, since complementary insights increase the richness of data. Multiple investigators may also build confidence in the findings and increase the likelihood of surprising findings. All of the interviews were conducted at the head-offices in Scandinavia of the companies being studied, and this, furthermore, provided the opportunity of observing how the work at the companies was performed. The researchers also had the opportunity of observing the company's organisational structure, during a guided tour of the companies' premises. Twelve interviews have hitherto been conducted with staff at the two companies. The cumulative interview time has amounted to about twenty-four hours, and the interviews have been conducted over a period of thirteen months. As well as hand-written notes, a tape recorder was used during the interviews. With the help of both the tapes and the hand-written notes, transcripts of the interviews were written. After the interviews, the data was briefly analysed and interesting themes about the subject of this chapter were identified.

The main reason that this chapter is built on more than one case is that my research interest ultimately relies on the phenomenon of Born Global SMEs in high-

tech businesses, and not on an individual case. In accordance with Stake (1994), I believe that we cannot understand one case without knowing about other cases. The cases in this study are chosen because understanding them will lead to better understanding, and perhaps better theorising, about a still larger collection of cases.

Born Global SMEs in High-Tech Businesses – What Are They About?

The empirical data on which this study is based is collected from two Scandinavian biotech companies, Alpha and Beta³. Both of these companies are relatively young Born Global SMEs that have focused on selling their products in international high-tech markets from the start. The companies, furthermore, conduct their own research and development, and have at least one product out on the market. Both companies also have at least one international customer in their portfolio.

Even though the two companies are similar in many ways, they are slightly different in terms of age and number of employees. The largest differences between the two companies studied are, however, their products on offer and the contact they have with the end users of their products.

Table 12.1 The Born Global SMEs

Company alias	Year of foundation	Number of staff	Business alignment	Means of performing international sales
Alpha	1997	28	Alpha develops, manufactures and sells micro-systems. Different product applications are also developed in close collaboration with the company's customers.	Exports products from headquarters in Scandinavia.
Beta	2001	25	Beta develops, manufactures and sells diagnostic products within the area of veterinary medicine and food safety. Beta specialises in the selling of test-kits for veterinary medicine testing.	Exports products directly from headquarters in Scandinavia, but focuses on selling their products through seventeen international distributors

Alpha

Alpha is a company that has specialised in manufacturing micro-components in plastic. Micro-components are traditionally made from silicon, which is a much more expensive material to utilise than plastic. Alpha is, furthermore, able to manufacture a plastic component in a fraction of the time that it takes to manufacture a similar micro-component in silicon. Alpha's production technology, with a large series of products that can be manufactured cheaply, fits well for one-time products in biotechnology or electronics. Even though Alpha can manufacture large quantities of products, different product applications must be developed in close and long-term collaborations with the

³ To maintain anonymity, the companies studied are represented by aliases.

customers/end-users before the manufacturing phase can begin. Alpha, furthermore, only sells products from their headquarters.

Beta

Beta manufactures and sells laboratory products that are utilised to analyse animal diseases. Traditional technology in the area of veterinary medicine requires that analytical tests be sent to external laboratories for testing. In contrast to traditional technology, Beta has developed tests-kits that speed up the test-procedures and even enable veterinarians to test animals on location. The test-kits that Beta manufactures aim to be easier to use and have a shorter assay time than traditional technology. Unlike Alpha, Beta does not need to develop product applications in cooperation with their customers. The test-kits that the company manufactures are ready to use instantly. Beta can therefore let distributors manage most of the company's international sales, even though the company also sells products directly to end users from their headquarters.

High-Technology, Exploration and Exploitation

Both Alpha and Beta are considered to be high-tech companies, since they belong to and compete in a high-tech business. Instead of merely offering a broad definition of the term high-tech, Gardner *et al* (2000) make an effort to define the difference between high-tech and low-tech products. They argue that “...*traditional or low technology products are those that employ familiar and accepted technology and whose acceptance and use are generally understood. Likewise, high technology products are those that employ turbulent technology in their use, manufacture and/or distribution, and are seen to require significant changes in usage patterns.*” (Gardner *et al*, 2000:1056).

Gardner *et al*'s explanation of the difference between high-tech and low-tech products, gives an indication that it is somewhat complicated to label a company as a fully-fledged manufacturer of high-technology products. Gardner *et al* (2000) also emphasise that the distinction between high versus low-tech products should not be considered as a matter of type, but as a matter of degree. In order to differentiate between products of different technical degrees, the terms exploration and exploitation will be used for the purpose of this study.

When the degree of newness in both technology and market is high, firms are mainly involved in a phase of exploration. When the degree of newness in technology and markets are low, firms mainly are involved in a phase of exploitation. For high-tech firms, the exploitation phase is possible when they have explored new technologies, developed innovative processes, products or services, and developed a market for their innovation. (Bengtsson & Holmquist, 2000)

Taking as a point of departure the terms exploration and exploitation, Alpha could be considered to be in an exploration phase whereas Beta is in an exploitation phase. One of the main reasons for this difference between the two companies is that Alpha has developed new technology and offers unique technological applications to their customers. Alpha's products are, thus, so new that the company constantly faces the challenge of informing actors in international

markets about the functions of their products. Beta’s technology, on the other hand, is accepted and frequently utilised by both customers and competitors. Beta, therefore, has access to a developed market in which to sell their products. Even though Beta’s technology is better known than Alpha’s newly developed technology, Beta’s products cannot be considered to be low-tech since their acceptance and use not are generally understood. Employees at Beta relate that they or their distributors must still assist customers occasionally.

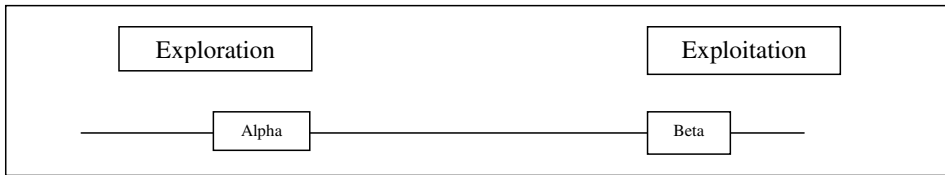


Figure 12.1 The Placement of the Companies on an Exploration/Exploitation Continuum

It is not only differences in technology that separates Alpha from Beta, but also the contacts that the companies have with their end users. In contrast to Beta, a company that still mainly uses distributors to sell its products, Alpha uses a great deal of resources keeping in contact with their most important end users themselves. The next section of this chapter will discuss the means of communication and technical aids that Born Global SMEs, like Alpha and Beta, can utilise to improve their relationships with and information about foreign business partners.

The Impact of Information Technology

In accordance with researchers that emphasise the opportunities that information technology offers for small and middle-sized enterprises (Oviatt & McDougall, 1993; Coviello & Munro, 1997; Jones, 1999; Jeffcoate *et al*, 2000; Lituchy & Rail, 2000; Fernández Jurado & Bilbao Calabuig, 2001; Hill, 2001; Feindt *et al*, 2002), the people that have been interviewed for the purpose of this study see information and communication technologies as helpful tools in their companies’ international operations. Alpha’s founder gives an example of how he has used the Internet to acquire information about potential customers in the USA:

“The choice of interesting potential clients is to a large extent a randomly performed process. In order to find potential customers in the USA I have used a homepage called Biospace.com that lists the American bio-companies. This homepage enables me to sort the companies after their area codes. This information is useful when I travel on scouting journeys in the states. With help of the area codes and the companies’ homepages I can contact the most interesting of these companies that are situated along my travel route.”

Besides using Internet to acquire information about foreign businesses, staff at the companies investigated regard e-mail as an important complement to the

telephone when it comes to keeping in touch with business partners. Beta's Product Manager relates:

"I handle most of my distributor relationships both through e-mail and telephone. The telephone is most useful for playing around with new ideas whereas technical queries more easily are handled through e-mail contact."

Also one of Alpha's Account Managers relates:

"E-mail is a useful tool because it documents everything that is going on in the relationship and clarifies what one of the parties want from the other. E-mail is also useful to communicate with customers situated in the USA because it solves the time difference problem. Also the telephone is a convenient tool in the early stages of a customer relationship."

Internet and e-mail are used as tools to obtain information and partake in communication with international business partners. Since resource-constrained, Born Global SMEs are often forced to compete in completely international markets almost directly from the outset, information technology offers an important means for them to conduct business in an inexpensive manner. The next section of this paper will further discuss the means of interaction that drive international relationships.

The Role of Face-to-Face Interaction

In accordance with the research that emphasises the significance of face-to-face interaction (Daft & Lengel, 1986; Nohira & Eccles, 1992; O'Hara-Devereaux & Johansen, 1994), employees in the two companies investigated discussed the importance of having face-to-face interaction with customers, but to different degrees. Unlike Beta, which mostly keeps in touch with their distributors via the telephone or e-mail, Alpha frequently interacts with their customers on a face-to-face level. Besides the contact per e-mail and telephone, Alpha's Account Managers try to meet the customers for which they are responsible every six to eight weeks. One of Alpha's Account Managers relates:

"It is essential to meet customers face-to-face. You can always start communicating with a customer through e-mail, but a deal can never be made before you meet somebody face-to-face. Products and services are sold between companies, but a deal is made with a specific person."

In accordance with the statement above, another of Alpha's Account Managers relates:

"To visit the customers is an important part of a seller's tasks. Good projects demand that companies see each other and build up a feeling for one another, especially in the beginning of a customer relationship. If we want to get our customers to return after the first project, the contacts between the customers and us must be physical, not only through e-mail and the phone...The only way to understand what customers need is to sit down with them. Homepages and the Internet can provide certain information but not enough."

Since Alpha develops their products in close collaboration with their customers, it is important that the company's staff interact on a personal basis with individuals at the customer companies. Initially, Alpha's visits also give their customers an opportunity to evaluate whether Alpha's staff are people with which they

want to work together or not. Beta has not focused on developing unique technology, like Alpha, and does not need to meet their customers often in order for the cooperation to work. Even so, employees at Beta believe that personal interaction is important for building lasting relationships. Beta's Product Manager relates:

“One of the targets of our marketing department is that the distributors on the most important target markets shall be followed up once a year. This follow up meeting shall be face-to-face and not through e-mail or the telephone...It is easier to cooperate with a distributor that you have a personal relationship with”

Even though the frequency of face-to-face meetings with customers differs between Alpha and Beta, individuals in both of the companies investigated emphasise the importance of meeting customers in person. Face-to-face interaction is, however, a very time consuming and expensive means of communicating with international customers. One journey to visit the company's different American customers for a week costs Alpha about 6 500 US\$ per person. Disregarding the financial costs, extensive travelling is, furthermore, associated with stress and is also a burden for the travellers' families. (Boutellier *et al*, 1998) The companies investigated, themselves, seldom receive visits from their customers, since the customers also have to keep within their budget.

One of the reasons that Alpha, in particular, visits their customers regardless of the high cost, is that it is important for the company to get to know their customers on a personal level. Meeting through face-to-face interaction is a way for Alpha to induce trust in their customers, and thereby reduce the customers' uncertainty about cooperating with Alpha. The next section of this chapter will discuss what companies can do to further portray themselves as trustworthy.

The Inducement of Trust and Reduction of Uncertainty

“The customer visits are, of course, important for building trust” (Extract from interview with one of Alpha's Account Managers)

Born Global SMEs must frequently overcome many challenges that larger and more established international companies can often disregard. In order to convince their international customers to take the risk of investing in brand new technology, small and unknown companies face the challenge of proving that they can be trusted. In order to do this, it is important to increase the level of information directed towards the customers (Kollock, 1994). It is particularly important for companies to provide additional information about their product and management team to their customers (Shepherd & Zacharakis, 2003).

Since the products that Beta sells are based on a rather established technology, there is often not much need to provide their customers with more information about the company's products than they already have. Beta's CEO relates:

“Many of our products are so well known that the customer does not need too much information before testing the products. In these cases our sellers do not have to visit companies to demonstrate how the product works. If the customer, on the other hand, has problems with their products, it is important that the distributor has the technical knowledge to help the customer”

Since Alpha's products are based on brand new technology, the company faces the important challenge of presenting their technology in an understandable manner to their customers. One of Alpha's Account Managers relates:

"It is not enough just saying that we have an interesting potential technology, we have to prove this somehow....We must therefore develop application examples to show the customers. We cannot show the customers fully developed products, but we develop them so far that we can show them something"

Besides providing necessary information about products, Alpha also provides their customers with information about their management teams by including high-level staff in the sales activities. Alpha's Head of Marketing and Applications relates:

"We want to introduce relationships with customers on at least two different levels. The idea of introducing Account Managers is that they shall move beyond the interaction with technical personnel at the customer company and leave these contacts to be managed by the technical project leaders. The roles of the Account Managers are instead to cooperate with the marketing representatives in the customer companies. Hopefully our founder will be able to enable a third relational level using his contacts with different individuals in the customers' management teams."

The quotations above indicate that it is a more important task for Alpha to provide their customers with additional information about their product and management teams, than for Beta, that exploits a more commonly accepted and standardised technology. When Alpha's customers receive information about the company's products and employees, they get the chance to process this information into additional knowledge about the company. According to Shepherd & Zacharakis (2003), even unflattering knowledge about a company's product and management is better than no knowledge at all. The old saying "Better the devil you know than the devil you don't know" can, therefore, be true when companies make purchase decisions with an unknown venture. Since knowledge reduces customer uncertainty, the additional information that Alpha provides to their customers may increase the chances of the customers wanting to do business with that company.

High-Tech = High-Touch?

In the companies investigated, the level of face-to-face interaction with customers is related to the level of uncertainty that the customers feel. The fact that Alpha's technology is rather new on the market, whereas Beta's technology is more widely used, also influences the customers' understanding of the two companies' respective technologies. The more uncertainties that the decision-making staff at a customer company feel and the less they know about the product and management of a supplier, the more information they need to acquire in order to reduce their uncertainties. When suppliers meet customers face-to-face the latter are provided with a rich source of information (Daft & Lengel, 1986; Nohira & Eccles, 1992). If a customers' face-to-face interaction with a supplier involves people at different levels at the two companies, customers can create a picture for themselves of the knowledge that resides in a company, how the organisation works and what experience the

management group possesses. Face-to-face interaction, furthermore, provides opportunities for customers to reflect over the multiple cues that suppliers display, and this makes it easier for the customers to interpret their counterparts as trustworthy or not.

Alpha’s customers feel great uncertainty about the company’s products since the technology around which Alpha is built is new and unknown. Alpha, therefore, has to spend a great amount of resources on interacting with its customers on a face-to-face level in order to reduce their uncertainties. Beta, which has based its products on better-known technology, does not need to go to the same length to reduce its customer’s uncertainties and seldom has to meet its customers on a face-to-face level.

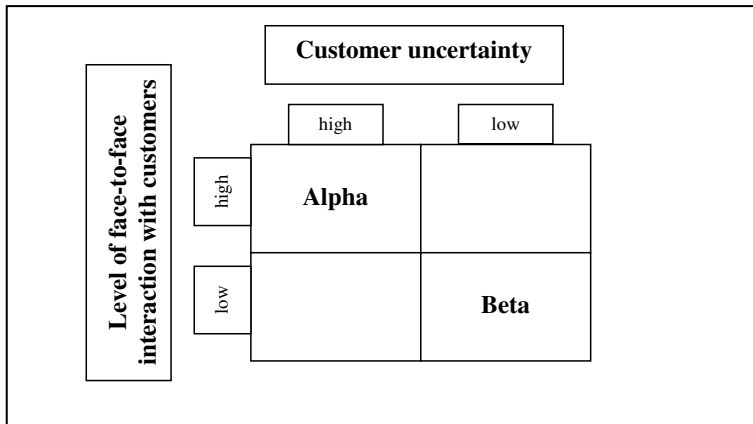


Figure 12.2 The Companies’ Level of Face-to-Face Interaction with Customers Related to the Customers’ Uncertainties.

Instead of following incremental paths to international markets, Born Global SMEs in the high-tech business are generally forced to operate in foreign markets almost directly from their start, in order to survive. Because of the fact that Born Global SMEs have to internationalise in a rapid manner, it is common for them to use tools like the Internet and e-mail, to collect information about, and keep in touch with, international customers. Even though these tools are very helpful, previous research indicates that they cannot work as a substitute for face-to-face interaction in all situations. Face-to-face interaction is, for instance, considered to be an important foundation when it comes to the inducement of trust and the reduction of uncertainty in the establishment and maintenance of business relationships.

The aim of this chapter was to investigate what role face-to-face interaction with customers still played for Born Global SMEs in the high-tech business, and how face-to-face interaction influenced trust and uncertainty in the relationships between Born Global SMEs and their customers. Even though no generalised results can be drawn from the empirical material in this chapter, the study indicates that a company’s level of face-to-face interaction with customers is related to the level of uncertainty that the customers feel about working with the company.

Customer uncertainty can, however, be reduced if the company provides useful information to their customers.

The results of the study, furthermore, indicate that the inducement of trust and the reduction of uncertainty are important tasks for certain Born Global SMEs that compete in international high-tech markets, since these kinds of companies must be able to convince their international customers to take the risk of investing in brand new technology. The inducement of trust and reduction of uncertainty is particularly important for companies that are in an exploration phase of their development, and act in a market that is signified by fast technological change. Companies that exploit a more commonly accepted and standardised technology, on the other hand, do not need to focus as much on inducing trust in their customers.

The utilisation of IT communication and face-to-face interaction are not mutually exclusive, and most Born Global SMEs that compete in high-tech businesses still use both in their endeavours to communicate with international customers. Since all companies, however, are different in terms of speed of technological change, producer difficulty in developing and manufacturing products, and customer understanding of technology, there is a need for more research about how IT solutions and face-to-face interaction with customers ought to be balanced in accordance with different kinds of companies' needs. More research is also needed about other factors that influence the relationships between Born Global SMEs and their international customers. Quantitative research could provide more detailed knowledge about these areas of research.

Managerial Implications

Even though IT offers good and cost-effective opportunities for resource-constrained and small companies to find information about, and communicate with, international customers, it may be of vast importance for companies that are in an exploration phase of their development to uphold frequent face-to-face interaction with customers. This is in order to improve the customers' level of trust in the companies and reduce uncertainties. Companies that compete with businesses that are signified by fast technological change and sell technology that is new and unknown must, therefore, be prepared to invest more resources in face-to-face interaction with customers than companies that compete in more established markets.

Even though it is generally less expensive to communicate with international customers with the help of IT solutions, in comparison to face-to-face meetings, companies that only utilise this means of interaction risk losing important opportunities. Face-to-face interaction with foreign customers can, for instance, lead to closer relationships with foreign business partners and an increased amount of knowledge about foreign markets.

Acknowledgements

I gratefully acknowledge the financial support of the Jan Wallander and Tom Hedelius' foundation, Handelsbanken, Sweden. I also wish to thank the anonymous reviewers for their helpful comments on the two earlier drafts of this chapter.

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Paper 5

The effect of personal interaction on the international technology development of SMEs

Emilia Rovira Nordman and Daniel Tolstoy*

Published 2008 in *Small Enterprise Research*, 16(1): 16-26.

*The authors appear in alphabetical order and have equally contributed to this paper.

Abstract

This study investigates the potential effect of personal interaction on international technology development in relationships between small and medium-sized enterprises (SMEs) and their foreign customers. The mediating effect of knowledge transfer between these firms and their customers is also examined. The results of a LISREL analysis of 188 relationships between SMEs and their foreign customers demonstrate that the effect of personal interaction on international technology development is not direct but rather is mediated by knowledge transfer. Hence, the study suggests that before international technology development can be enhanced, knowledge transfer needs to be established.

Introduction

A widely shared conception amongst researchers and practitioners in the field of international business is that small and medium-sized enterprises (SMEs) continuously rely on technology development to enhance business performance in foreign markets. International technology development is an innovative activity that enables SMEs to create a competitive advantage by aligning their business operations with the specific conditions of foreign markets. International technology development is here understood as the creation of new technology that underlies business operations in foreign markets (Yli-Renko, Autio, & Sapienza, 2001).

Extant research has shown that research-constrained SMEs can successfully exploit opportunities of new technological solutions by leveraging the external competence of foreign customers (Komulainen, Mainela, & Tahtinen, 2006; Yli-Renko et al., 2001). However, no clear consensus regarding appropriate media strategies of SMEs when developing new technology in customer relationships has been reached. Although numerous studies have investigated less personal modes of interaction, such as the use of information and communication technology (ICT) (e.g., Azumah, Koh, & Maguire, 2005; Knight, 2001), the connection between personal interaction and international technology development is still largely unexplored in the realm of foreign customer relationships of SMEs. Against this background, this study attempts to contribute to research on internationalising SMEs based on the argument that personal interaction in foreign customer relationships is at the nexus of international technology development. Hence, the specific purpose of the article is to examine the effect of personal interaction on international technology development in the relationships between SMEs and their foreign customers. Personal interaction is here viewed as rich modality interaction (i.e., face-to-face communication and telephone communication) that facilitates knowledge-demanding processes, such as technology development (Daft & Lengel, 1986; Murray & Peyrefitte, 2007). This objective is consistent with recent research that has called for more studies investigating the interpersonal communication and resilience of rich modality interaction (Molony, 2007; Murray & Peyrefitte, 2007).

As an additional contribution, this article also examines whether personal interaction may configure social settings in which knowledge can be transferred in foreign customer relationships. Knowledge transfer is here viewed as the process by

which knowledge is mutually shared between firms (Nonaka, 1994). Knowledge transfer between organisations is critical for international technology development because it allows the integration of complementary pieces of knowledge across organisations. Consequently, knowledge transfer in customer relationships may align innovation activities with local market conditions and lead to synergetic outcomes, such as new technology (Audretsch & Feldman, 1996; Quintana-García & Benavides-Velasco, 2006).

The remainder of the article is structured as follows: A review of previous literature discussing different aspects of personal interaction, knowledge transfer and international technology development is presented. Based on this literature review, three hypotheses are proposed. We then describe the method and findings of the data analysis. Finally, a concluding discussion, as well as implications, limitations and future research ideas, is presented.

Theoretical Framework and Hypotheses Presentation

Internationalising SMEs often compete on the basis of technology, which intensifies the challenges associated with managing research and development (R&D). By seeking linkages and participating in alliances with foreign business partners, SMEs can cut costs and increase performance in international technology development (OECD, 2002). We propose that the use of many ICT tools alone may not be sufficient for SMEs to manage technology development in foreign customer relationships because such relationships are bound to involve knowledge transfer between firms that cannot be fully mediated by the constrained frames of codification of ICT. Research suggests that rich modality interactions have unique traits that can enable an efficient transfer of knowledge, especially so-called tacit knowledge (or know-how) that is hard to formalise and communicate (Murray & Peyrefitte, 2007; Tödtling & Kaufmann, 2001). Rich modality interactions may, therefore, have an edge over some ICT tools (like e-mail and intranet) when interacting with customers for the purposes of technology development because this process is often dependent on accurate and immediate feedback, which is facilitated by a high degree of personal involvement.

Even though ICT tools like video and web conferencing also allow immediate feedback, previous observations have revealed that SMEs often have not adopted these kinds of ICT tools because of a lack of resources, awareness and/or skills for ICT adoption (OECD, 2002). Moreover, the organisational changes following ICT investments are frequently perceived by firms as costly (Basu & Fernald, 2008) and may therefore be waived.

Previous studies about interaction quality have shown that communication media differ in the richness of the information processed. The quality of the communication media is based on the media's feedback capability, the utilised communication channels, language variety and personal focus. The more a medium incorporates these characteristics, the richer it is (Daft & Lengel, 1986; Suh, 1999). In the hierarchy of media richness, face-to-face communication is richest, followed by telephone, e-mail and print communications (Treviño, Webster, & Stein, 2000). Because this study aims to capture the personal elements of interaction, the analysis is based on the top two levels of media richness, face-to-face interaction (the highest)

and telephone interaction (the second highest) (Suh, 1999). Hence, these two means of interaction are indicators of personal interaction because they provide the parties in a business relationship with multiple sources of information, like body language (in face-to-face encounters) and tone of voice (in both face-to-face and telephone encounters). Furthermore, both of these means of interaction have a personal focus and enable the use of natural language (Daft & Lengel, 1986). They also allow for real-time feedback, inflection, timing of response and—in the case of meetings and telephone conferences—multiple participants (Murray & Peyrefitte, 2007).

Companies often have to engage in close and deep interactions with their customers. Therefore, business exchange can be viewed as an intricate process between parties (who are neither anonymous nor faceless) in which social interaction and technical adaptations are closely intertwined (Håkansson & Waluszewski, 2002). Personal interaction amongst firms' business units facilitates innovative activities via the exchange of new ideas that may not be readily relayed by the use of more formal mechanisms (Ghoshal, Korine, & Szulanski, 1994). Previous studies have also shown that the bulk of product or technological development in business relationships does not take place solely in either supplier or customer organisations but rather interactively between them (Jokiainen & Soumala, 2006; Thorpe, Holt, Macpherson, & Pittaway, 2005). Interaction between firms when developing new technology (i.e., participation in R&D projects, engineering and scientific activities) is ultimately grounded in the individual interpretation of complex, uncodifiable messages that require closeness between the sender and the receiver (Piscitello & Sgobbi, 2003). Different communication platforms can, thus, substantially affect behaviours and outcomes in business relationships. For instance, electronic communications may be less helpful than more personal forms of communication in open-ended situations where participants require instant and accurate feedback (Frohlich & Oppenheimer, 1998), which often may be the case in situations involving international technology development. Correspondingly, Noteboom (1999) suggests that personal interaction may reduce the cognitive distance between interacting parties and make knowledge accessible and deployable for purposes of technology development. Furthermore, the perceived gap reduction between organisations may facilitate coordination in this type of relationship—without parties having to specify appropriate behaviour beforehand (Filippi & Torre, 2003). Hence, personal interaction in customer relationships diminishes the spatial and/or cognitive distance to markets and enables firms to adapt technological advances to local conditions (e.g., Audretsch & Feldman, 1996; Rovira, 2005). Based on research indicating that personal interaction entails particular benefits in technology development projects, we hypothesise the following:

Hypothesis 1: Personal interaction has a positive effect on SMEs' international technology development in foreign customer relationships.

Knowledge is one of the most important assets a firm can possess and, therefore, constitutes a highly strategic factor (Johanson & Vahlne, 1977). Competitive advantages of knowledge may be determined by its degree of tacitness. Nonaka (1991) put forth that 'Tacit knowledge consists partly of technical skills—the kind of informal, hard-to-pin-down skills captured in the term "know-how"' (p. 98). Tacit

knowledge is important because it is more inimitable than other types of knowledge and, therefore, often more valuable in competitive business situations. These qualities entail that tacit knowledge is difficult to formalise and communicate (Polanyi, 1966). Previous studies have, however, indicated that personal interaction facilitates the efficient transfer of tacit knowledge (Murray & Peyrefitte, 2007; Tödttling & Kaufmann, 2001).

An individual can acquire tacit knowledge without language by using the senses to observe, listen, imitate and practise. Exchange mechanisms, such as meetings and telephone conversations, containing distinctive traits regarding verbal and non-verbal cues are, therefore, particularly important for the acquisition of tacit knowledge. Because knowledge transfer is more likely to occur between individuals who communicate frequently with each other, organisational members might, therefore, be willing to share knowledge if they have a personal stake in other individuals (Murray & Peyrefitte, 2007). Personal interaction stimulates knowledge transfer in geographical space, thus allowing firms to tap into the regional resources of foreign markets (Oerlemans & Meeus, 2005). Consequently, the need for personal interaction to transfer tacit knowledge has been regarded as a key driver for firms pursuing localised learning and engaging in local industrial agglomerations (Asheim, 1999).

Internationalisation literature describes tacit, or experiential, knowledge about foreign markets as a critical resource for a firm (Johanson & Vahlne, 1977, 2006). Skills necessary for understanding the regional knowledge of the foreign market are more likely to be developed by firms that are willing to partake in interactive learning processes with other firms (Lundvall & Johnson, 1994). Correspondingly, knowledge transfer via business relationships has been emphasised in studies concerning resource-constrained SMEs that are operating in international markets (e.g., Coviello & Munro, 1997; Rovira, 2005). These studies show that knowledge transfer allows SMEs to explore new technological solutions in foreign markets by combining internal and external knowledge resources. In so doing, firms may be able to develop competitive new solutions concerning procedural competences (e.g., R&D) and products/services.

Because tacit knowledge about foreign markets is considered a critical resource for internationalising firms, and that the transfer of such knowledge may be enhanced by improved communication and personal interaction, we propose the following hypothesis:

Hypothesis 2: Personal interaction has a positive effect on SMEs' knowledge transfer in foreign customer relationships.

Knowledge is critical in the process of technology development because what an organisation knows determines what it is capable of doing. Internationalisation research has described the exploitation of technological opportunities as a consequence of privileged knowledge that emanates from knowledge transfer between business partners (Johanson & Vahlne, 2006). In contrast to larger firms, SMEs tend to be equipped with intrinsic innovative qualities that are exerted in continual, and often informal, efforts of technology development (OECD, 2002; Tödttling & Kaufmann, 2001). These qualities may explain why SMEs are inherently more flexible than larger

firms and are less likely to be ‘locked in’ by existing technologies or organisational structures.

According to Katz and Kahn (1966), the innovation process of firms is an open system where input of heterogenous knowledge is transformed into outputs of technological innovations. Correspondingly, many internationalising SMEs rely on business counterparts to grant input to innovation or technology development activities because all necessary resources cannot be leveraged internally (Tödtling & Kaufmann, 2001). Knowledge transfer that leads to technology development often occurs in customer relationships in which the involved parties participate in processes of joint problem solving and experimentation of alternatives (von Hippel, 1988). In addition, a study by Yli-Renko et al., (2001) indicate that international technology development appears to be enhanced when different kinds of knowledge are combined in processes of knowledge transfer in customer relationships. Based on this research, we propose the following hypothesis:

Hypothesis 3: Knowledge transfer has a positive effect on SMEs’ international technology development in foreign customer relationships.

Previous research has shown that SMEs engaged in innovative activities, like technology development, are more likely to be dependent on foreign business collaborations than other firms (Freel, 2000). To provide insight into SMEs’ international technology development in customer relationships, we devised a hypothesised structural model (see Figure 1) based on research indicating that a positive relationship exists between personal interaction and technology development (Ghoshal et al., 1994; Håkansson & Waluszewski, 2002; Rovira, 2005). The model also tests whether SMEs’ personal interaction with foreign customers can enhance knowledge transfer, which in turn augments international technology development.

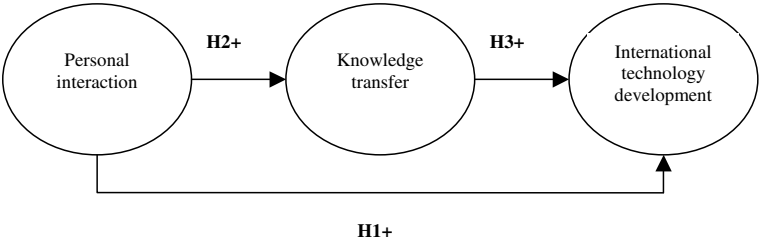


Figure 1 Relationships Between the Constructs of Personal Interaction, Knowledge Transfer and International Technology Development.

Method

To perform this study, a questionnaire was constructed. All constructs that are discussed in this study revolve around an important and specific foreign customer relationship chosen by the respondent. The selected relationship had to conform to the following criteria:

1. The customer is located in a foreign market.
2. The relationship is ongoing and has resulted in realised sales transactions.

This relationship will continuously be referred to as ‘the selected foreign customer relationship’. The questions in the questionnaire are, furthermore, based on the respondents’ knowledge about their firms’ international business development and are measured on a seven-item categorical scale, with ratings ranging from low to high. To strengthen the validity of the study, the variables included in the questionnaire stemmed from empirical observations and theoretical reviews that were conducted within a larger Swedish research project investigating the internationalisation patterns of SMEs. Within the larger project in progress, variables were developed from three sources: (a) prior questionnaires developed within the project (e.g. Blomstermo, Eriksson, Lindstrand, & Sharma 2004) (b) an extensive literature review on international firms used to identify new measurement scales and (c) case studies on international SMEs conducted between 2003 and 2005 (e.g. Rovira 2005; Löfgren, Tolstoy, Johanson, & Sharma 2008).

Sample

A stratified random sample of Swedish SMEs was acquired from Statistics Sweden’s Business Register in 2003. The firms in this sample shared one common characteristic: At least 10% of their turnovers were from export sales. The sample consisted of two groups: small firms (5–49 employees) and medium-sized firms (50–249 employees). Because the sample firms operated in niche segments in various types of industries, the premises for technology development naturally varied across these firms in terms of complexity and scope. However, in line with the focus of this paper, a common denominator amongst the sample firms was the challenge of gaining competitive advantage, for example by the development of new technological solutions that were aligned with the specific conditions of the foreign markets.

To ensure a high response rate, the questionnaires were collected by conducting personal visits to the sample firms. Because of the time-consuming nature of this collection method, only SMEs in the same geographical area (Mälardalen) were surveyed so as to minimise the collection time required. The Mälardalen area was chosen mainly because of its large size and geographical proximity to the members of the research group. The derived sample of firms from the Mälardalen area consisted of 339 firms. After individuals at these firms were contacted by phone, some firms were excluded because they were too large (i.e., they were not SMEs), they did not sell their product to foreign customers (i.e., they were not internationalising) or they no longer existed. After this reduction, the total sample consisted of 233 SMEs.

Data Collection

Prior to its distribution to the derived sample, the questionnaire was tested on six SMEs in Stockholm and Uppsala. Modifications concerning the scope and content of the questionnaire were subsequently carried out. To ensure strong reliability, the questionnaires were, as mentioned earlier, administered by investigators who personally visited the Swedish SMEs. By visiting the firms, the research group could make sure that the right person answered each questionnaire. The study used a single key informant approach, which is commonly practised in marketing research (Phillips, 1981). Individuals who were considered key informants and singled out as such included chief executive officers (CEOs) and marketing managers who influence decisions related to foreign operations. The duration of each visit ranged from 30 to 60 minutes. To avoid investigator-induced bias, respondents filled out the questionnaires themselves; research group members were present solely as observers. Data were collected from 188 of the 233 SMEs in the sample. The two main reasons for the non-responding firms' declination to participate were (a) a lack of time and (b) a reluctance to release information. Even though a response rate of 81 percent is considerably high in comparison to other similar studies, a non-response bias is always a concern. Because the investigators personally collected the surveys, non-response bias by applying the common test of comparing early vs. late responses (Armstrong & Overton, 1977) could not be conducted. Instead, secondary data collected from the Statistics Sweden's Business Register were used to control for differences between responding and non-responding firms related to industry, size, location and level of internationalisation. No differences between the groups were revealed; thus, a non-response bias is not likely to be a problematic issue when interpreting the findings of the study.

Data Analysis

This study used the linear structural relations (LISREL) statistical package to process data. The validity of LISREL models is measured with regard to both the validity of the entire model and the specific relationships within the model. Convergent validity is confirmed if the indicators load only on the constructs to which they belong. Evaluation of convergent validity is done by analysis of *t*-values (significance), *R*²-values (linearity) and factor loadings (correlation). A basic requirement for confirmation of discriminant validity is that the correlation between latent variables be significant but not equal to 1, which would suggest unidimensionality (Jöreskog & Sörbom, 1993).

The overall fit of LISREL models is checked using the chi-square (χ^2), degrees of freedom and a probability estimate (*p*-value). There is an ongoing debate about the appropriate measures to use for assessing nomological validity (Bollen & Long, 1993). Three frequently used measures are goodness of fit (GFI), which checks for sample size effects and should be above 0.90; root mean square error of approximation (RMSEA), which measures population discrepancy per degree of freedom (df) and should be below 0.08; and comparative fit index (CFI), which checks for non-normal distributions. CFI values close to 1 indicate a good fit, and values above 0.90, an acceptable fit (Jöreskog & Sörbom, 1993). Pairwise deletion was used to handle

missing values. The model's robustness was also checked using listwise deletion, which yielded a similar result ($\chi^2 = 8.31$, $df = 7$, $p = 0.30$)

Construct Analysis

The personal interaction construct captures the personal and human elements of interactions between individuals in business organisations. According to Daft and Lengel (1986), the two richest forms of media are interactions through face-to-face encounters and telephone conversations. Using this categorisation, we created a construct based on the number of face-to-face meetings and telephone conversations that the investigated firms had with their selected foreign customers. We expected daily face-to-face meetings with foreign customers to be difficult for resource-constrained SMEs to afford. However, this indicator generated normal distribution in our initial data analysis. The telephone communication indicator also showed a normal variance.

The knowledge transfer construct comprises three dimensions. The first dimension of the construct determines whether the investigated firms recognise their selected foreign customers as sources of knowledge (i.e., whether the firms have identified potential input for knowledge transfer) (Nahapiet & Ghoshal, 1998). In accordance with von Hippel's (1988) conception of knowledge transfer as a joint process between firms, the second dimension of the construct involves reciprocal knowledge sharing between firms. Correspondingly, respondents are asked whether their firm's relationship with the selected foreign customer is characterised by a general exchange of knowledge. The third dimension of the construct measures the qualitative aspects of knowledge transfer by determining whether the selected foreign customer's knowledge is perceived as familiar to respondents. Familiarity with a customer's knowledge indicates that knowledge is interpreted and that firms have the capability to transfer knowledge (Cohen & Levinthal, 1991).

Finally, the dependent construct of the model, international technology development, is a one-indicator construct based on the perception of new technology developed in the selected foreign customer relationship. The reliability of this single-item construct is set at an arbitrary estimate of 1. Following the recommendations of Jöreskog and Sörbom (1993), this study tested the model by varying this estimate at several equally arbitrary values (0.75, 0.85 and 0.95) and found no basic differences in the structural model.

Table 1 The constructs and their indicators included in the structural model

Indicator	Abbreviation	Factor Loading	<i>t</i> -value	<i>R</i> ² -value
Personal interaction				
How many times does your firm have contact with [the selected foreign customer] via personal visits? (8-point categorical scale, 1 = none; 2 = once in a three-month period; 3 = several times in a three-month period; 4 = once a month; 5 = several times a month; 6 = once a week; 7 = several times a week; 8 = daily)	CONBR1	0.76	9.23	0.58
How many times does your firm have contact with [the selected foreign customer] via telephone calls? (8-point categorical scale, 1 = none; 2 = once in a three-month period; 3 = several times in a three-month period; 4 = once a month; 5 = several times a month; 6 = once a week; 7 = several times a week; 8 = daily)	CONBR2	0.77	9.35	0.60
Knowledge transfer				
The [selected foreign customer] is a source of knowledge. (7-point categorical scale, 1 = not at all; 7 = completely)	BRIS3	0.76	7.87	0.58
The relationship with the [selected foreign customer] is characterised by a general exchange of knowledge. (7-point categorical scale, 1 = not at all; 7 = completely)	RELBR8	0.62	n.a.	0.51
In the [selected foreign customer] relationship, how familiar is the business partner's knowledge? (7-point categorical scale, 1 = completely; 7 = not at all)	FAMIBR5	0.52	n.a.	0.27
International technology development				
The extent to which the selected foreign customer relationship has resulted in new technology. (7-point categorical scale, 1 = not at all; 7 = completely)	TECHDEV	1	n.a.	1

Note: n.a. = not applicable due to fixed parameter.

Table 1 lists the LISREL estimates for all constructs. All *t*-values are above 7.87 and, thus, satisfactory. All *R*²-values are above 0.27, indicating a high degree of explanatory power.

Results

The hypothesised model's key statistical measures support nomological validity ($\chi^2 = 7.54$, $df = 7$, $p = 0.37$). RMSEA is 0.020; GFI is 0.99; and CFI measures to 1. Thus, it may be concluded that the model is valid.

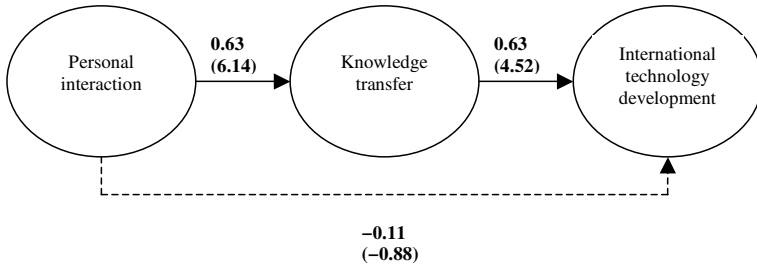


Figure 2 Structural Model with Factor Loadings^a

^aDotted lines represent non-significant relationships.

Note: t-values within parentheses.

As shown in Figure 2, Hypothesis 1 is not supported by the model because the relationship between personal interaction and international technology development is not statistically significant within the causal structure. Based on our theoretical premises, this finding is indeed counterintuitive, which suggests that the relationship between personal interaction and international technology development is somewhat more complex than was first anticipated. The deviation from our theoretical pre-understanding may be explained by the presence of the knowledge transfer construct. The model implies that even though personal interaction is not instrumental for international technology development unto itself, it is an important requisite for knowledge transfer. Hence, the model shows that personal interaction has a positive effect on the knowledge transfer construct, thus confirming Hypothesis 2. This finding supports our theoretical rationale positing that personal involvement is instrumental in disseminating knowledge between individuals and organisations. The model also supports Hypothesis 3, demonstrating that the knowledge transfer construct has a positive effect on international technology development. This finding is consistent with theory claiming that firms need to exchange knowledge with customers to adjust products/services to foreign market conditions. Thus, personal interaction when mediated by knowledge transfer has an indirect effect on international technology development. This finding suggests that knowledge transfer must occur before international technology development can be enhanced. Knowledge transfer is an important component of this model because it bestows personal interaction with guidance and direction, which are necessary in leveraging new technological solutions.

Based on four control variables, possible differences between groups were investigated. Group analysis in LISREL is performed by setting construct relations, indicator relations and an error covariance equal for all groups (Jöreskog & Sörbom, 1993, p. 53). If key statistics are invalid, a difference occurs between the groups. The following control variables were chosen for group analysis of the sample: (a) firm size, (b) foreign market share of total sales, (c) relationship duration and (d) geographical proximity.

Firm size (estimated by the number of employees) was chosen as a control variable to detect differences between the small (6-49 employees) and medium-sized firms (50-249 employees) in the sample, which would have implications for the validity of the SME concept in this research context (OECD, 2002). LISREL estimates revealed no differences between the groups.

Foreign market share of total sales was selected as a control variable to detect differences between firms based on the relative importance of the market where the selected foreign customers reside. We split the sample into two groups: firms making 20 percent or more of their total sales in the selected foreign market and firms making less than 20 percent of their total sales in the selected foreign market. The resulting LISREL models revealed no differences between groups.

To determine whether time has an effect on the model (which would have theoretical implications on the constructs and relationships of the model), relationship duration was chosen as a control variable. Relationship duration was measured by dividing the sample into two groups: firms that have participated in business relationships with their selected foreign customers for five years or fewer and firms that have participated in business relationships with their selected foreign customers for longer than five years. LISREL estimates revealed no differences between the groups.

Geographical proximity was selected as a control variable to control for differences between firms depending on their geographical distance to markets. Geographical proximity was measured by dividing the sample into two groups: firms that chose to answer questions about a selected foreign customer from one of Sweden's neighbouring countries (Denmark, Finland or Norway) and firms that chose to answer questions about a selected foreign customer from a more geographically distant part of the world. LISREL estimates revealed no differences between these groups.

Discussion and Managerial Implications

The aim of this study was to examine the effect of personal interaction on international technology development in the relationships between SMEs and their foreign customers and to provide insight into the prospective intermediate effect of knowledge transfer on international technology development. We determined that the effect of personal interaction on international technology development is not direct but rather is mediated by the knowledge transfer construct. The absence of a direct effect between personal interaction and international technology development is somewhat surprising considering that previous studies indicated a direct relationship between the constructs of personal interaction and technology development (Ghoshal et al., 1994; Håkansson

& Waluszewski, 2002; Rovira, 2005). By contrast, personal interaction has an indirect effect on international technology development within the realm of this structural model. This effect, although indirect, is positive and powerful because personal interaction strengthens the relational interface between firms (i.e., knowledge transfer), which in turn has a positive effect on international technology development. These findings support previous studies indicating that positive relationships exist between personal interaction and knowledge transfer (e.g., Murray & Peyrefitte, 2007; Oerlemans & Meeus, 2005) and between knowledge transfer and technology development in foreign business relationships (e.g., Johanson & Vahlne, 2006; Yli-Renko et al., 2001).

The theoretical implication of these findings is that personal interaction, in and of itself, is not an instrument for technology development. Personal interaction instead plays a pivotal role in coordinating and contextualising heterogeneous knowledge, thus paving the way for knowledge transfer. Hence, by enhancing the capacity to transfer knowledge in customer relationships, personal interaction ultimately promotes international technology development.

By showing that personal interaction still plays, and probably will continue to play, an important role for technology development in SMEs' foreign customer relationships, the study contributes to interaction-oriented research on internationalising SMEs. Even though ICT tools certainly may offer efficient and cost-effective opportunities for resource-constrained SMEs when searching for information and communicating with foreign customers, they cannot substitute personal interaction in every situation. Personal interaction is vital for firms faced with complex tasks in business relationships and may justify the time and effort entailed. The results therefore indicate that SMEs need to allocate resources to personal interactions with important international counterparts to facilitate technological development. The costs of personal interaction should be balanced against the potential benefits brought by international technology development to an internationalising SME. The need for SMEs to invest in personal interaction activities must also be acknowledged by actors such as venture capital investors, governmental institutes and trade organisations. For these actors to be properly equipped to support international growth of SMEs, they first have to understand the challenges involved in international technology development.

Furthermore, the results of this study may have implications for managers. Because SMEs often possess limited resources, they are unable to allocate the resources needed to produce fertile ground for international technological development throughout their entire business network. Although international technology development is often regarded as constituting a firm's competitive edge, investments in international technology are not necessarily profitable. Our findings indicate that managers must be careful in deciding which relationships should be managed by personal interaction and which should be managed by other means. Scanning the market for relationships with eligible, interesting foreign counterparts becomes extremely important because it allows managers to respond to emerging opportunities that lead to international technology development. Such conduct could involve strategic networking, evaluation of potential counterparts' business objectives and corporate culture, benchmarking and cost assessment.

Limitations and Suggestions for Future Research

This study has three limitations that suggest directions for future research. First, interactive business relationships may be initiated after technology development has taken place (Håkansson & Waluszewski, 2002). This occurrence would imply a reverse causality of the model (i.e., international technology development has a positive effect on personal interaction). Studying a two-way causality would make the model not only more complex but also more dynamic, thereby adding a temporal dimension, which is missing in this article. The non-recursiveness of LISREL analysis makes testing for a two-way causality impossible in this study but is recommended as a topic for future research to address.

Second, the information collected was taken solely from one side of the dyadic relationships under examination. The extent to which the counterparts of the firms investigated would have concurred with the answers in the data collected is unknown. Additional insight could be gained from future studies involving dyadic data sets.

Third, data were collected at only one point in time; therefore, no temporal changes in the suggested model can be discussed. Further longitudinal studies are needed to determine the effect of time on the results of this paper.

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Paper 6

The innovative product development of internationalising SMEs

Emilia Rovira Nordman

Accepted for publication in *International Journal of Learning and Intellectual Capital*, Forthcoming, 2010.

Abstract

The purpose of this paper is to examine the impact of two kinds of experiential knowledge on the knowledge development and innovative product development (IPD) of internationalising small and medium-sized enterprises (SMEs). From this examination, six hypotheses are generated. The results of a linear structural relations (LISREL) analysis of 188 SMEs show that experiential knowledge—in the shape of relationship knowledge and network knowledge—has a direct effect on the knowledge development of internationalising SMEs and their foreign customers and an indirect effect on IPD. Resource-constrained SMEs, thus, use experiential knowledge acquired from foreign business relationships as a means to enable knowledge development, leading to innovative activities like IPD.

Introduction

Interest in *innovative product development* (IPD) as an essential basis for economic growth has mushroomed in recent decades. Previous research has shown that small and medium-sized enterprises (SMEs) that are engaged in innovation like IPD are more likely to have collaborations with foreign business relations than non-innovators (Freel, 2000). Because foreign network relationships enable SMEs to fill important human capital and resource gaps in their own organisations (Scozzi *et al.*, 2005), the ability of individual firms to improve product development is enhanced (Frahm *et al.*, 2007). Knowledge development activities, together with network relationships, have, thus, been emphasised as important prerequisites for IPD to occur (Allocca and Kessler, 2006), which strongly influences both the access to knowledge resources and the performance of internationalising SMEs. For the purpose of this paper, IPD is regarded as an innovative activity that leads to the development of at least one physical product that is either radically new or perceived as new by its developers (Van de Ven, 1986).

This study is based on the idea that SMEs' interaction with foreign business relations can initiate knowledge development, which in turn can lead to IPD and that there exist a relationship between experiential knowledge and innovation activities. Previous studies have focused on the development of experiential knowledge (here, defined as a tacit form of knowledge that can be acquired only via interaction with foreign business relationships) in explaining the success of internationalising firms (Johanson and Vahlne, 1977; Eriksson *et al.*, 1997). Other studies have identified the interaction in network relationships as a highly important means for internationalising SMEs to gain access to vital experiential knowledge resources (Sharma and Blomstermo, 2003; Blomstermo *et al.*, 2004). However, no empirical studies have, to the best of my knowledge, investigated the role of experiential knowledge as a predictor of knowledge development (i.e., the process of knowledge being developed) and IPD of SMEs and their foreign customers. Thus, to contribute to knowledge-based research about internationalising and innovative SMEs, the purpose of this paper is to examine the impact of two kinds of experiential knowledge on the knowledge development and IPD of internationalising SMEs. By carrying out this examination and determining which kinds of experiential knowledge

(if any) are important predictors for enabling knowledge development and IPD, this study endeavours to help innovative, and often resource-constrained, SMEs to succeed and continually enhance their performances in foreign markets.

The rest of the paper is organised as follows: First, the theoretical building blocks on which the paper's argumentation is built are presented and hypotheses are proposed. Second, the method and data analysis are presented. Third, linear structural relations (LISREL) analysis is employed to examine a sample of 188 Swedish SMEs that were surveyed about their foreign business relationships. Finally, the results of this study are presented, followed by a concluding discussion and a discussion about the limitations of the present study and suggestions for future research.

Theoretical Framework and Hypotheses Presentation

Relationship Knowledge

Business scholars have long regarded knowledge to be one of the most important assets that a firm can possess (Van Gils and Zwart, 2004; Thornhill, 2006). Knowledge based on experience has sometimes been called *tacit knowledge*. The phenomenon of tacit knowledge is derived from the idea that individuals know more than they can explain. For instance, much of what constitutes human skill remains unarticulated and is known only to the person who has that skill. In contrast, explicit knowledge is relatively easy to articulate and communicate and, thus, transfer between individuals and organisations. (Polanyi, 1966)

Knowledge based on experience is also a vividly discussed topic within internationalisation literature. According to Johanson and Vahlne (1977), a distinction can be made between knowledge that is acquired from a firm's own experience of operating in foreign markets (i.e., experiential knowledge) and knowledge that can be acquired from standardised methods (i.e., objective knowledge). Here, experiential knowledge is described to be more difficult to acquire as it must be acquired through personal experience from operating abroad, whereas objective knowledge can be acquired from market research and, therefore, can be taught. Based on the arguments put forth by Johanson and Vahlne (1977), experiential knowledge is, in this paper defined as a tacit form of knowledge that can be acquired only via interaction with foreign business relationships.

Existing SME research frequently emphasises the need to examine SMEs from a different perspective than larger firms, primarily because of the resource constraints of these firms (Coviello and Munro, 1997; Thornhill, 2006; Wolf and Pett, 2006; Eriksson *et al.*, 2007). This lack of financial, human capital and knowledge resources can, of course, be seen as a serious impediment that may hamper the experiential knowledge development of SMEs, particularly for those firms that compete in international markets. Recent research streams have, however, indicated that even though SMEs tend to have limited funds to use for research and development (R&D) activities or to accelerate production processes, their flexibility, lack of bureaucracy, rapid and effective communication and decision making and motivated employees give them an advantage over larger firms (Koskinen and Vanharanta, 2002;

Allocca and Kessler, 2006). Moreover, SMEs frequently use their business relationships to acquire and develop new knowledge (Van Gils and Zwart, 2004; Scozzi *et al.*, 2005).

Building on a study by Eriksson and Chetty (2003), relationship knowledge is defined here as the experiential knowledge a partner in a dyadic customer relationship has of a specific foreign customer. Through interactions with customers, firms obtain access to external knowledge that they can combine with their existing knowledge, and prior related knowledge also facilitates the development of new knowledge in an ongoing business (Eriksson and Chetty, 2003). Innovative activities often take place in cooperative customer relationships, where the involved parties participate in a process of joint problem solving (von Hippel, 1988). Studies about innovative SMEs have, in fact, shown that a strong positive link exists between innovation activities and customer orientation, thus arguing that small firms should cultivate more customer relationships as a means of developing new knowledge, which in turn could lead to the development of new products (De Jong and Vermeulen, 2006). These findings suggest that it is possible for SMEs to acquire knowledge from business relationships by procuring some of the knowledge of others and developing it into something new. Thus, a positive relationship may exist between an SME's relationship knowledge of a specific customer and new knowledge development with this partner. Based on this line of reasoning, the following hypothesis is proposed:

Hypothesis 1: An SME's relationship knowledge of a foreign customer has a positive impact on knowledge development with this customer.

Network Knowledge

Network knowledge is defined here as the experiential knowledge a firm in a business network has about other network relationships that are active in the same market as SMEs and their customers. The concept of network knowledge is based on the idea that a dyadic relationship between a firm and a specific customer does not evolve in isolation from other business relationships but rather is influenced by these relationships. The network approach regards markets as entities that directly or indirectly connect exchange relationships and make such relationships dependent on each other (Mattsson and Johanson, 2006). The knowledge utilised in a firm is, thus, often obtained from relationships with others in the firm's business network (Freel, 2000; Yli-Renko *et al.*, 2001).

Knowledge of specific relationships in a network is acquired by doing and is experiential and hard to transfer (Eriksson and Chetty, 2003). The conduction of international business, thus, relies on experiential knowledge, which emerges from accumulated experiences of specific relationships and specific markets (Johanson and Vahlne, 1977). What a firm has experienced comprises important lessons for the firm's further international expansion (Blomstermo *et al.*, 2004). The knowledge that a firm acquires in foreign markets has been shown to impact the effectiveness and knowledge transfer in those markets (von Hippel, 1998).

The creation and sharing of knowledge in specific networks have been proven to be effective in the form of relative productivity advantages for all

participating parties in the business network. Empirical evidence has, for instance, shown that experiences accumulated within networks have often served as the primary vehicle for the development and performance of firms (Blomstermo *et al.*, 2004) and that network relations can accelerate their pace of knowledge acquisition after participating in knowledge-sharing networks (Dyer and Nobeoka, 2000). Networks are, moreover, argued to provide knowledge useful for innovation and non-routine problem solving (Hansen, 1999). The locus of innovation will, in fact, rather be found in networks of learning, rather than in individual firms (Powell *et al.*, 1996), indicating that knowledge development in networks can provide more knowledge for innovation than single business relationships. Relationships with network partners are thus considered important for the development of knowledge by internationalising firms, thus indicating that it is possible for SMEs to garner knowledge from network relations and develop it further. Therefore, the argument can be made that SMEs whose experiences have taught them to rely on the knowledge of network relationships will use their experiences when participating in new knowledge development activities with customers in the same market. This argument suggests that a positive relationship exists between SMEs' knowledge of network relations and the knowledge development of SMEs and their foreign customers. To test this relationship, the following hypothesis is suggested:

Hypothesis 2: An SME's network knowledge about network relationships in a certain market has a positive impact on its knowledge development with foreign customers in the same market.

Interaction and Knowledge Development

Previous internationalisation studies have indicated that experiential knowledge of foreign markets requires durable and repetitive interactions abroad because sporadic interaction with foreign counterparts produces little experience (Eriksson *et al.*, 1997). The concept of interaction is, therefore, included in this study.

Previous studies about the quality of interaction have shown that communication media differ in the richness of the information processed. The quality of the communication media is based on the media's feedback capability, the communication channels utilised, language variety and personal focus. The more a medium incorporates these characteristics, the richer it is (Daft and Lengel, 1986; Suh, 1999). In the hierarchy of media richness, face-to-face communication is richest, followed by telephone, e-mail and print communications (Treviño *et al.*, 2000). Because this study aims to capture elements of interaction that facilitate knowledge-demanding processes, share experiential knowledge and build mutual understanding, the term *interaction* in this study includes only the top two levels of media richness, face-to-face interaction (the highest) and telephone interaction (the second highest) (Suh, 1999).

Even though previous studies have focused on the usability of information and communications tools like email and the Internet by SMEs in their internationalisation processes (Moen 2002), other studies have suggested that rich modality interaction best enables an efficient transfer of experiential (or tacit)

knowledge (Hansen *et al.*, 1999; Tödttling and Kaufmann, 2001). Rich modality interaction may have an edge because knowledge development is often dependent on accurate and immediate feedback which is most easily achieved via face-to-face and telephone conversations. In addition, rich modality interaction provides the different parties in a business relationship with multiple sources of information, such as facial expression and body language (in a face-to-face encounter) and tone of voice (in both face-to-face and telephone encounters).

In this study, knowledge development is considered within the setting of business relationships. The knowledge that a firm acquires from interacting with a business counterpart constitutes the base of this firm's relationship knowledge of the counterpart, which suggests that a positive relationship may exist between an SME's increased relationship knowledge of a specific business relationship and the increased quality and quantity of interaction within this business relationship. The following hypothesis is, thus, proposed:

Hypothesis 3: An SME's relationship knowledge of a foreign customer has a positive impact on its interaction with this customer.

A high quality and quantity of interaction with foreign network relationships are particularly important for SMEs, which need knowledge and experience from networks based abroad to acquire international experience (Simmie, 2002). Foreign business activities provide opportunities for knowledge development together with network relationships in specific markets (Eriksson *et al.*, 1997), and experiences acquired from previous market operations are relevant because they enhance the success of later expansions in the same country (Barkema *et al.*, 1996).

Because experiential knowledge aids interaction between network relationships, and previously acquired experiential knowledge facilitates later interactions with network relationships in the same market, the argument can be made that, to duplicate the successes achieved in the past, SMEs use their experiences of interaction with network relations when they interact with new customers in the same market. This argument suggests that a positive relationship exists between SMEs' network knowledge and the quality and quantity of SMEs' interactions with their customers. To test this relationship, the following hypothesis is proposed:

Hypothesis 4: An SME's network knowledge about network relationships in a certain market has a positive impact on its interaction with foreign customers in the same market.

The importance of knowledge development via business relationships has previously been emphasised in studies concerning the internationalisation processes of SMEs (Coviello and Munro, 1997; Autio *et al.*, 2000). Because previous research has indicated that knowledge development may be enhanced by improved communication and interaction (Szulanski, 1996), and that experiential knowledge about foreign markets can be acquired only via involvement in business relationships within these markets (Johanson and Vahlne, 1977), the development of knowledge in foreign business relationship settings is often contingent on interaction. Furthermore, previous

research has shown that a high quality and quantity of interaction may be necessary for new knowledge to be developed, especially in the case of SMEs that are involved in innovative activities like product development (Rovira, 2005). In particular, radical innovations have many tacit elements, which are best dealt with through high-quality interaction (e.g., face-to-face interaction). This type of interaction is invaluable for brainstorming and for sorting out specific bottlenecks that firms experience in the course of pursuing knowledge development (Romijn and Albu, 2002).

Based on this previous research, an argument can be made that it may be necessary for an SME seeking knowledge, which cannot be acquired within the boundaries of the firm itself, to engage in high quality and quantity interaction as a means of developing this knowledge in external business relationships. The following hypothesis is, thus, suggested:

Hypothesis 5: An SME's interaction with foreign customers has a positive impact on knowledge development with these customers.

Innovative Product Development

When creating newness, knowledge is often critical for innovation to occur. Whether the knowledge is internally generated or externally acquired, what an organisation knows determines what it can do (Thornhill, 2006). Previous studies about innovative SMEs have indicated that a positive relationship exists between knowledge development in business relationships and successful innovation activities (Tödtling and Kaufmann, 2001), like IPD. Yli-Renko *et al.*, (2001), moreover, showed that firms acquiring greater market and technological knowledge through their key customer relationships generate a greater number of new products. The utilisation of alliance relationships has also frequently been viewed as a means for resource-constrained SMEs to conduct innovative activities like IPD (Allocca and Kessler, 2006; Frahm *et al.*, 2007).

The results of these previous studies indicate that a positive relationship exists between an SME's knowledge development with customers and IPD with customers. To test this relationship, the following hypothesis is suggested:

Hypothesis 6: An SME's knowledge development with foreign customers has a positive impact on IPD with these customers.

The Hypothesised Model

Previous research has shown that SMEs that are engaged in innovative activities like IPD are more likely to have collaborations with foreign business relationships than non-innovators (Freel, 2000). With the preceding statement as its starting point, a hypothesised structural model is devised from the hypotheses presented in the previous sections (see Figure 1). This model is derived from the idea that SMEs' interaction with foreign business relations can initiate knowledge development, which in turn can lead to IPD. The hypothesised model is based on research showing that a relationship exists between experiential (or tacit) knowledge and innovation activities (Romijn and

Albu, 2002) and that knowledge development leading to innovations often comes from a variety of sources (MacDonald *et al.*, 2007). In this study, the different sources of experiential knowledge that lead to knowledge development are represented by customers and other network relations, which are located in markets that are foreign from the perspective of the investigated SMEs.

The construct of interaction is included in the model because knowledge leading to innovation is believed to be transferred in an interactive process involving the exchange of information (MacDonald *et al.*, 2007). Through interactions with others, firms are said to obtain access to external knowledge that they can combine with their existing knowledge, which in turn facilitates knowledge development (Eriksson and Chetty, 2003). Figure 1 depicts the six hypotheses that are investigated in this study. They are consolidated into a model containing five constructs and six relationships between the constructs.

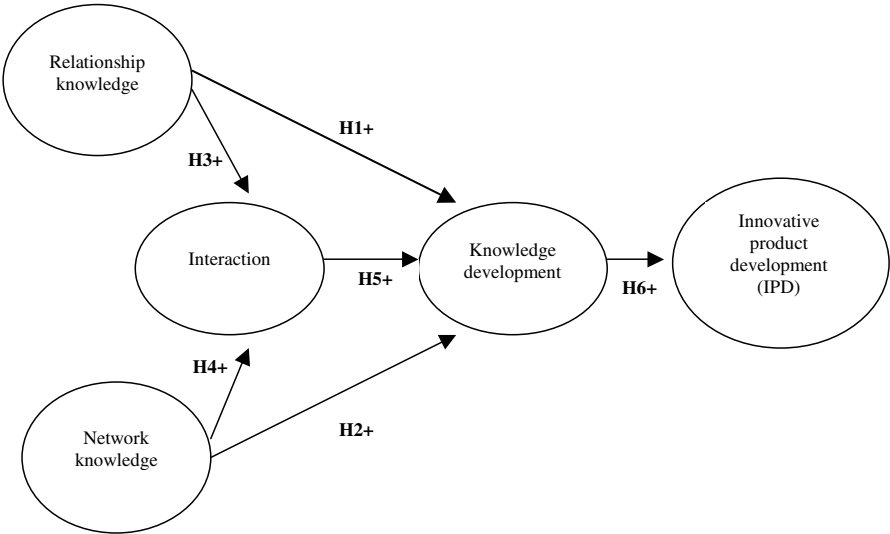


Figure 1 Hypothesised Model of Relationships Between the Constructs: ‘Relationship knowledge’, ‘Network knowledge’, ‘Interaction’, ‘Knowledge development’, and ‘Innovative product development’

Research Design

To fulfil the purpose of this paper a questionnaire was constructed. All constructs that are discussed in this study are based on questions from this questionnaire and revolve around important and specific foreign customer relationships, which was chosen by the respondents. These particular relationships are continuously referred to as ‘the selected foreign customer [relationships]’.

The questions in the questionnaire are based on the respondents’ knowledge about their firms’ business development in a particular foreign market and are measured on a seven-item categorical scale, with ratings ranging from low to high. To strengthen the validity of the study, the variables included in the questionnaire stemmed from empirical observations and theoretical reviews.

Sample

A stratified random sample of Swedish SMEs was acquired from Statistics Sweden’s Business Register in 2003. One common characteristic of the firms in this sample, which belong to all kinds of industries, was that at least 10% of their turnovers are from export sales. The sample consisted of two groups: small firms (1–49 employees) and medium-sized firms (50–250 employees). The motivation for the stratified sample was simply to create a variation in size amongst the SMEs. If the sample had not been stratified, most firms would likely have been categorised as small because 97% of the firms in Sweden have 50 or fewer employees. To ensure a high response rate, the questionnaires were collected by conducting personal visits to the sample firms. Because of the time-consuming nature of this collection method, only SMEs in the same geographical area (Mälardalen) were surveyed so as to minimise the collection time required. The Mälardalen area was chosen partly because of its large size and partly because of its geographical proximity to the members of the research group. The derived sample of firms from the Mälardalen area consisted of 339 firms. After individuals at these firms were contacted by phone, some firms were excluded because they were too large (i.e., they were not SMEs), they did not sell their product to foreign customers, (i.e., they were not internationalising), or they no longer existed. After this reduction, the total sample consisted of 233 SMEs.

Data Collection

Several precautions were taken to ensure the reliability of the data collection. Before the questionnaire was distributed to the derived sample, it was given to six SMEs in Stockholm and Uppsala for testing. Based on the assessment of these tests, the questionnaire was shortened and certain expressions that the respondents had found confusing were modified.

To ensure strong reliability, investigators proceeded to collect the questionnaires by personally visiting the Swedish SMEs. In so doing, the investigators were able to ensure the following: (1) the right individual answered the questionnaire, (2) a high response rate and (3) a low number of missing values. The individuals who were considered key informants (and singled out as such) consisted of chief executive

officers (CEOs) and marketing managers who have had an effect on decisions related to foreign operations. The time spent on each visit ranged from half an hour to one hour.

Data were collected from 188 of the 233 SMEs in the sample. Hence, about 19% of sample firms chose not to participate in the study. The two major reasons for the nonresponding firms' declination to participate were as follows: (1) a lack of time and (2) a reluctance to release information. Even though a response rate of 81% is considerably high in comparison to other similar studies, a nonresponse bias is always a concern. Because the surveys were collected as a result of booked meetings with the respondents, the investigators could not apply common tests (e.g., early versus late responses) to detect a nonresponse bias (Armstrong and Overton, 1977). Instead, secondary data collected from Statistics Sweden's Business Register were used to control for differences between responding and nonresponding firms relating to industry, size, location and level of internationalisation. This analysis revealed no differences between the groups; therefore, a nonresponse bias is unlikely to be a problematic issue when interpreting the findings of the study.

Data Analysis

Data from this study were processed using LISREL, a statistical package. Structural equation modeling, such as LISREL, is a statistical technique used to study direct and indirect relationships between one or more independent variables and one or more dependent variables. When interpreting the validity of a structural model, one should take into account that each relation is a part of the broader context constituted by the model. Thus, one should consider not only the direct effects but also the indirect effects. The implication is that the relationships cannot be analysed piece by piece; all constructs have to be evaluated within the framework of the entire model.

The validity of LISREL models is measured with regard to the validity of both the entire model (nomological validity) and the specific relationships within the model. Because the model comprises various constructs, the validity may be estimated by measuring the degree of separation between constructs (discriminant validity) as well as the degree of homogeneity of these constructs (convergent validity). Convergent validity is confirmed if the indicators load only on the constructs to which they belong. Convergent validity is evaluated by analysing t values (significance), R^2 -values (linearity) and factor loadings (correlation). A basic requirement for confirmation of discriminant validity is that the correlation between latent variables should be significant but not equal to 1, as that would suggest unidimensionality (Jöreskog and Sörbom, 1993).

The overall fit of LISREL models is checked by using the chi-square, degrees of freedom measures, and a probability estimate (p value). There is an ongoing debate of what measures to use for assessing nomological validity (Bollen and Long, 1993). Three frequently used measures are as follows: (1) the goodness of fit index (GFI), which checks for sample size effects and should be above 0.90; (2) the root mean square error of approximation (RMSEA), which measures population discrepancy per degrees of freedom and should be below 0.08; and (3) the comparative fit index (CFI), which checks for non-normal distributions. A CFI value close to 1

indicates a good fit, and a value above 0.90 is considered an acceptable fit (Jöreskog and Sörbom, 1993).

Construct Validity

The constructs discussed in this study revolve around an important, specific dyadic foreign customer relationship that had been chosen by the respondent. Previous research has shown that the depth of knowledge acquired by a firm about its business relationships and a particular country increases as the firm commits to this business relationship (Eriksson and Chetty, 2003). During this commitment process, knowledge about what the customer can offer also increases. The degree of familiarity associated with the business activities of a business relationship can also be viewed as an indication that a firm has attained deeper knowledge of the relationship's actions (Jayachandran, 1999). Thus, familiarity can be said to include information about the routines and expertise of other individuals or firms (Okhuysen, 2001). Here, the relationship knowledge construct comprises three dimensions of the qualitative aspect of familiarity. These dimensions are whether the selected foreign customers' service content, knowledge and manner of solving problems are perceived as familiar. The more familiar the capabilities of the selected foreign customers are to the SMEs, the greater the indication that the SMEs have gained experience while working with these customers and that tacit knowledge has, thus, been interpreted in this knowledge development process (Nonaka, 1991). All the constructs and their indicators included in the structural model are presented in Table 1. Key statistics indicate convergent validity for the relationship knowledge construct, (FAMIBR3: $t = 8.87$, $R^2 = 0.37$; FAMIBR5: $t = 15.62$, $R^2 = 0.89$; FAMIBR6: $t = 13.74$; $R^2 = 0.74$).

Table 1 The constructs and their indicators included in the structural model

<i>Indicator</i>	<i>Abbreviation</i>	<i>Factor loading</i>	<i>t value</i>	<i>R²-value</i>
Relationship knowledge				
In the [selected foreign customer] relationship, how familiar is the business relationship's service content? (7-point categorical scale, 1 = not at all; 7 = completely)	FAMIBR3	0.61	8.87	0.37
In the [selected foreign customer] relationship, how familiar is the business relationship's knowledge? (7-point categorical scale, 1 = not at all; 7 = completely)	FAMIBR5	0.94	15.62	0.89
In the [selected foreign customer] relationship, how familiar is the business relationship's method of solving problems? (7-point categorical scale, 1 = not at all; 7 = completely)	FAMIBR6	0.86	13.74	0.74
Network knowledge				
To what degree is the [the selected foreign customer relationship] dependent on your previous experiences of customers' knowledge? (7-point categorical scale, 1 = not at all; 7 = completely)	EXPLCU4	0.91	11.53	0.83

To what degree is the [the selected foreign customer relationship] dependent on your previous experiences of suppliers' knowledge? (7-point categorical scale, 1 = not at all; 7 = completely)	EXPLSU4	0.45	5.83	0.20
To what degree is the [the selected foreign customer relationship] dependent on your previous experiences of customers' customers' knowledge? (7-point categorical scale, 1 = not at all; 7 = completely)	EXPLCC4	0.60	8.96	0.48
Interaction				
How many times does your firm have contact with [the selected foreign customer] via personal visits? (8-point categorical scale, 1 = none; 2 = once in a 3-month period; 3 = several times in a 3-month period; 4 = once a month; 5 = several times a month; 6 = once a week; 7 = several times a week; 8 = daily)	CONBR1	0.77	n.a.	0.60
How many times does your firm have contact with [the selected foreign customer] via telephone calls? (8-point categorical scale, 1 = none; 2 = once in a 3-month period; 3 = several times in a 3-month period; 4 = once a month; 5 = several times a month; 6 = once a week; 7 = several times a week; 8 = daily)	CONBR2	0.76	7.13	0.58
Knowledge development				
The relationship with the [selected foreign customer] is characterised by innovative knowledge development. (7-point categorical scale, 1 = not at all; 7 = completely)	RELBR6	0.89	n.a.	0.79
The relationship with the [selected foreign customer] is characterised by general exchange of knowledge. (7-point categorical scale, 1 = not at all; 7 = completely)	RELBR8	0.70	10.13	0.49
Innovative product development				
The [selected foreign customer relationship] has resulted in new products. (7-point categorical scale, 1 = not at all; 7 = completely)	RESNEW1	0.35	n.a.	0.12
The [selected foreign customer] is a source of innovations. (7-point categorical scale, 1 = not at all; 7 = completely)	BRIS4	0.85	4.28	0.73

Studies have shown that if a firm has previous experience of working in a country, this prior related knowledge will be of greater benefit to the firm in terms of its expansion within this particular country as opposed to its entry into new, unfamiliar countries (Barkema *et al.*, 1996). This finding, together with the implications that dyadic relationships between a firm and its foreign customers are also embedded in a network of connected business relationships and that knowledge is frequently obtained via the interaction within these networks (Powell *et al.*, 1996; Dyer and Nobeoka, 2000; Sharma and Blomstermo, 2003), makes network knowledge a necessary construct to investigate in the context of this study. Moreover, network constructs have previously

been used in studies to capture the experiences made in customers' networks (Eriksson and Chetty, 2003).

A fundamental criterion for network knowledge transfer is the existence of accessible knowledge sources. In this study, network knowledge is based on the investigated firms' previously acquired knowledge about the knowledge of important network relationships. The first two dimensions of this construct are based on the firms' dependence on knowledge from their closest counterparts in the foreign market about whom they answered questions, customers (not including the specific foreign customer relationship around which the questionnaire revolved) and suppliers. Because SMEs have frequently been shown to use intermediaries as distributors or agents to further their internationalisation (Sharma and Blomstermo, 2003), it is of significant importance to include the knowledge that the investigated SMEs could acquire from the end-users of their products; therefore, the dimension of customers' knowledge is also included in this construct that exhibits convergent validity, (EXPLCU4: $t = 11.53$, $R^2 = 0.83$; EXPLSU4: $t = 5.83$, $R^2 = 0.20$; EXPLCC4: $t = 8.96$, $R^2 = 0.48$).

The construct of interaction captures the frequency of personal and human elements of interaction between the investigated SMEs and their foreign customers. They are indicative of the investigated SMEs' time and resource investments, which are needed to strengthen the quality and quantity of their communication with customers. According to Daft and Lengel (1986), the two richest forms of media are face-to-face interaction and telephone conversations. Therefore, this construct is built on the basis of the frequency of firms' face-to-face meetings and the frequency of telephone conversations with their selected international customers. Key statistics indicate convergent validity for the construct, (CONBR1: $R^2 = 0.60$; CONBR2: $t = 7.13$, $R^2 = 0.58$).

New knowledge promoting business improvement is often found outside firm's boundaries (De Jong and Vermeulen, 2006). Knowledge development is difficult to analyse because it is specific to the context of the relationship. In this study, knowledge development within the relationship between the investigated SMEs and their foreign customers was measured with the help of two statements reflecting the way in which the SMEs regarded their customers' abilities to provide them with new and important knowledge, thus enabling knowledge development to occur. The first dimension is a cooperative measure of whether the respondent perceives the business relationship to be characterised by innovative knowledge development. Innovative activities often take place in cooperative customer relationships, where the involved parties participate in a process of joint problem solving (von Hippel, 1988). The second dimension, which is also based on this view of knowledge development as a joint process between firms, measures the SMEs' perception of whether knowledge is being reciprocally shared between them and their customers. Hence, the study asked about a firm's perception of whether a relationship is characterised by a general exchange of knowledge. The construct of knowledge development exhibits convergent validity, (RELBR6: $R^2 = 0.79$; RELBR8: $t = 10.13$, $R^2 = 0.49$).

Innovative product development is regarded as an innovative activity leading to the development of at least one physical product that is either radically new or perceived as new by its developers (Van de Ven, 1986). The first indicator in this

construct is set to capture the radically innovative product development by investigating the SMEs' perception of physical products being newly developed as a direct result of the selected foreign customer relationship. The second indicator in this construct is less rigid with respect to radical innovations because it measures whether the respondents regard their selected international customers as sources of innovations. This indicator focuses on innovation in its broadest sense and is also designed to capture incremental improvements of existing products. Key statistics indicate convergent validity for the construct, (RESNEW1: $R^2 = 0.12$; RELBR8: $t = 4.28$, $R^2 = 0.73$).

Results

Figure 2 shows that the hypothesised model's key statistical measures support nomological validity [$\chi^2 = 59.15$, with 47 *df*, $p = 0.11002$, GFI = 0.95, RMSEA = 0.37, CFI = 0.98]. Therefore, in this Swedish data set, the results can be continued to be interpreted.

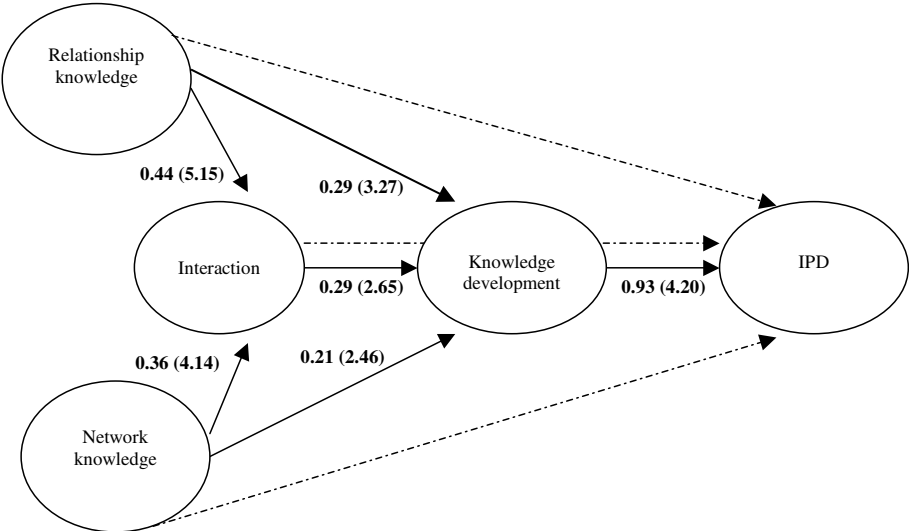


Figure 2 Structural Model with Factor Loadings (*t* values within parentheses) (Control relationships that proved to be nonsignificant are represented by dotted arrows.)

It was argued in hypothesis 1 that an SME's relationship knowledge of a foreign customer has a positive impact on knowledge development with this customer. This hypothesis is supported ($\gamma_1 = 0.29$; $t = 3.27$). The results also support hypothesis 2, which proposed that an SME's network knowledge about network relationships in a

certain market has a positive impact on its knowledge development with foreign customers in the same market ($\gamma_2 = 0.21$; $t = 2.46$).

Hypothesis 3 predicted that an SME's relationship knowledge of a foreign customer has a positive impact on its interaction with this customer. This hypothesis is also supported ($\gamma_3 = 0.44$; $t = 5.15$). The results also indicate that an SME's network knowledge about network relationships in a certain market has a positive impact on its interaction with foreign customers in the same market, hence confirming hypothesis 4 ($\gamma_4 = 0.36$; $t = 4.14$). Hypothesis 5, which proposed that an SME's interaction with foreign customers has a positive impact on knowledge development with these customers, is also confirmed ($\gamma_5 = 0.29$; $t = 2.65$). In addition, the results show that an SME's knowledge development with foreign customers has a positive impact on IPD with these customers ($\gamma_6 = 0.93$; $t = 4.20$), thus confirming hypothesis 6.

When the model was tested, pairwise deletion was the method used to handle the missing values. The model's robustness was also checked using the listwise deletion method, which yielded a similar valid result [$\chi^2 = 58.46$, with 47 *df*, $p = 0.12196$, GFI = 0.94, RMSEA = 0.041, CFI = 0.98]. The normality of the model's variables were, furthermore, examined by the computation of normal scores of ordinal variables, followed by an analysis of skewness and kurtosis (Eriksson et al., 2007). There were no significant indications of the distributions not being normal.

In the initial stages of testing and analysing the hypothesised model, control relationships of the three constructs (relationship knowledge, network knowledge and interaction) were tested against the construct of IPD. These control relationships (represented by dotted arrows in Figure 2), however, proved to be statistically insignificant within the causal structure. The model displayed in Figure 2, therefore, provides evidence that the effects of both network knowledge and relationship knowledge on IPD are mediated by the constructs of interaction and knowledge development. In addition, the model confirms that interaction has a direct positive effect on knowledge development, which in turn has a positive effect on IPD.

Control Variables

Performing group analysis with the LISREL method is a common practice used to control for possible similarities and differences between types of respondents within the sample (Eriksson *et al.*, 1997). To test the validity of the data analysis and to identify deviations that may exist between different groups in the SME sample, two control variables (firm size, and geographical proximity) were used.

The difference in size between firms has long been a topic of discussion in the literature. In comparison to larger firms, smaller firms must be able to manage limited financial and management resources more prudently to remain competitive (Allocca and Kessler, 2006), which ought to influence their investments in knowledge development activities. Firm size has also been argued to influence both knowledge development and knowledge exploitation (Autio *et al.*, 2000; Yli-Renko *et al.*, 2001). The control variable of firm size (estimated by the number of employees) was, therefore, chosen to determine if differences exist between the small firms (1–49 employees) and the medium-sized firms (50–249 employees) in the sample. The

LISREL analysis revealed no significant differences between the two groups in the basic structure of the model.

Even though SMEs are often described as resource constrained (Coviello and Munro, 1997; Thornhill, 2006; Wolf and Pett, 2006; Eriksson *et al.*, 2007), a common topic within internationalisation research is the phenomenon of small firms that internationalise into distant markets in a rapid manner (Autio *et al.*, 2000). Factors that have been used to explain this phenomenon include the increased use of information technologies and the use of international network relationships that are not as resource constraining (e.g., distributors and agents) as those often used by larger firms (e.g., foreign subsidiaries) (Andersson and Wictor, 2003). The control variable of geographical proximity was chosen to control for differences between firms based on their geographical distance to markets. This measurement was needed to determine whether geographical distance influences the model, which would have theoretical implications on the constructs (particularly, the construct of interaction) and relationships of the model. Geographical proximity was measured by dividing the sample into two groups: firms that have chosen to answer questions about a selected foreign customer from one of Sweden's neighbouring countries (Denmark, Finland or Norway) and those that have chosen to answer questions about a selected foreign customer from a more geographically distant part of the world. LISREL estimates revealed no significant differences between the two groups in the basic structure of the model.

Discussion

In recent years, decision makers and researchers have begun to realise that SMEs comprise a key segment of most national economies. If SMEs were to engage in more innovation activities that lead to the generation of new products, they would become more competitive, which in turn would create more jobs and greater wealth (MacDonald *et al.*, 2007). Even though a few studies have shown that SMEs often have a higher propensity to engage in innovation activities in comparison to larger firms (Koskinen and Vanharanta, 2002; Allocca and Kessler, 2006), studies about the knowledge development and IPD of internationalising SMEs are still scarce. Thus, there is a blatant need to further investigate the predictors for knowledge development and IPD in the resource-constrained reality of internationalising SMEs. The purpose of this paper is to contribute to knowledge-based research about internationalising and innovative SMEs by examining the impact of two kinds of experiential knowledge (relationship knowledge and network knowledge) on the knowledge development and IPD of internationalising SMEs.

The findings provided evidence that even resource-constrained SMEs use experiential knowledge acquired from foreign customers and other network relations as a means to acquire important knowledge that can be used for IPD. These results thus support the findings of previous studies that have identified relationships with other firms in the business network as essential for the development of knowledge (Powell *et al.*, 1996; Freel, 2000; Yli-Renko *et al.*, 2001) and that knowledge can lead to IPD (Allocca and Kessler, 2006; Frahm *et al.*, 2007).

A interesting result of the data analysis concerns the role of interaction. This construct was included in the hypothesised model because previous research studies indicated that rich modality interaction facilitates a more efficient transfer of experiential knowledge (Hansen *et al.*, 1999; Tödting and Kaufmann, 2001; Koskinen and Vanharanta, 2002). The interaction construct did not turn out to be a critical mediator between relationship and network knowledge and knowledge development. Both relationship knowledge and network knowledge, however, proved to have a strong effect on interaction, which in turn positively influenced knowledge development and IPD.

From a managerial perspective, this study shows that both network knowledge and relationship knowledge acquired via counterparts lead to knowledge development in the same foreign market. Previously acquired experiences, thus, have a positive effect on knowledge development, which implies that an SME that is inclined to participate in knowledge development and IPD can draw on past relationships and experiences. The need for SMEs to establish and participate in business relationships with foreign counterparts must also be acknowledged by actors such as venture capital investors, governmental institutes and trade organisations. For these actors to be equipped properly to support international growth of SMEs, they first have to understand the challenges entailed in SMEs' innovation activities with foreign business relations.

Because SMEs are limited in resources, they are unable to allocate the resources needed to produce fertile ground for relationships throughout their entire business network. Scanning the market for relationships with eligible, interesting international counterparts becomes extremely important because it can lead to knowledge development, which in turn can lead to IPD. Such conduct could involve strategic networking, evaluation of potential counterparts' business objectives and corporate cultures, benchmarking and cost assessment. Even though knowledge development is often regarded as giving companies a competitive edge, it must be remembered that not all investments in IPD are necessarily profitable. Companies should also remember that the accumulation of experiential knowledge is costly (Eriksson *et al.*, 1997). Before making significant investments in relationship-building activities, managers must analyse the potential benefits to be gained from participating in knowledge-building activities with foreign business relationships. Resource-constrained SMEs should explore the new business opportunities that may result from such interaction. Will the investments lead to new international business, and will a business relationship allow a firm to offer a new, co-developed product to other customers? These are questions that managers need to answer before making large investments to enable the development and transfer of network and relationship knowledge.

Limitations and Suggestions for Future Research

Suggestions for future research directions can be derived from the limitations of the present study. One limitation of this study involved the size of the data sample, which consisted of data collected from only Swedish SMEs. Future research focusing on

larger and broader samples of internationalising firms is recommended to validate further the results of this study.

Previous research has indicated that either the buyer or the seller in a business relationship may take the initiative to develop new technology or new products together with the other party (Håkansson and Waluszewski, 2002), which justifies an exogenous stance and argues for a reverse causality of the model. Because of space limitations, a discussion of such a two-way causality is not included in this study. Even though such a model would be more complex, it would also be more dynamic and, thereby, add a temporal dimension, which is missing in this article. There is a need to know more about the matters of two-way causalities, and further research is, therefore, recommended.

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