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Abstract

Internationalisation is one of the main issues in international business research. Since the 1970s, numerous internationalisation theories have been developed. The emergence of new internationalisation theories is facilitated by changes in the international political and business environment. During the past two decades, new knowledge-intensive industries have emerged and grown rapidly.

Despite the academic interest in the internationalisation of knowledge-intensive companies, a lack of literature taking into account both theoretical and empirical aspects exists. Hence, the objective of this study was to analyse the theoretical and empirical literature on the internationalisation of knowledge-intensive companies in order to develop a deep understanding of the research conducted on the topic. Important issues in the analysis were the development of internationalisation theories and the use of different theories in the empirical literature. Literature review was chosen as research method due to the interest in a broad understanding of the state of theoretical and empirical literature on the topic.

Theoretical literature on the internationalisation of knowledge-intensive companies was found to be scarce. Despite the weak representation of knowledge-intensive companies in the theoretical literature, knowledge plays an important role in many theories. Based on the theoretical literature, resources and dynamic capabilities are the most important fundamentals leading to internationalisation. Born-global strategies have been proven to be an important source of competitive advantage.

The empirical literature showed that three groups of factors influence the internationalisation of a company: individual level, firm level and industry and network level factors. International orientation and experience of managers were found to be crucial individual level factors facilitating internationalisation. Individual level factors, such as international experience of managers were found to be crucial for internationalisation. Additionally, unforeseen events can often have a significant impact on the internationalisation of a company. Born global theory was found to be the most influential theoretical background in the empirical literature, followed by stage models and the network model. The resource-based view and the knowledge-based view were used surprisingly scarcely. Further research should be conducted in order to discover the reason for this underrepresentation.

Key words	Internationalisation, knowledge-intensive companies, internationalisation theories
Further information	



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#### Tiivistelmä

Kansainvälistyminen on yksi kansainvälisen liiketoiminnan tutkimuksen pääaiheista. 1970-luvulta lähtien on kehitetty lukuisia kansainvälistymisteorioita, jotka ovat syntyneet tarpeesta selittää ympäristössä tapahtuvia muutoksia. Kahden viime vuosikymmenen aikana on syntynyt uusia tietointensiivisiä aloja, joiden kasvu on aiheuttanut tarpeen tietointensiivisten yritysten kansainvälistymisen tutkimiselle.

Akateemisesta mielenkiinnosta huolimatta teoreettisen ja empiirisen näkökulman huomioonottavaa kirjallisuutta on niukasti. Tämän tutkielman tarkoitus oli tarkastella teoreettista ja empiiristä kirjallisuutta tietointensiivisten yritysten kansainvälistymisestä tavoitteena monipuolinen kuva tutkimuksen tilasta. Tärkeitä näkökulmia olivat kansainvälistymisteorioiden kehitys ja niiden esiintyminen empiirisessä kirjallisuudessa.

Yllättävän niukan teoreettisen kirjallisuuden perusteella resurssit ja dynaamiset kyvykkyydet ovat tärkeimmät yrityksen kansainvälistymiseen johtavat tekijät. Born global –strategia johtaa usein vahvaan kilpailuetuun. Yrityksen kansainvälinen menestys riippuu kansainvälistymisstrategiasta sekä kytköksistä kansainvälisiin verkostoihin ja kyvystä hyödyntää näitä.

Empiirisen kirjallisuuden perusteella yrityksen kansainvälistymiseen vaikuttavat tekijät voidaan jakaa kolmeen ryhmään: yksilötaso, yritystaso ja teollisuudenala-/verkostotaso. Tärkeimpiä yksilötasolla kansainvälistymistä edistäviä tekijöitä ovat johtoportaan kansainvälinen suuntautuminen ja kokemus. Motivaatio yrityksen kansainvälistymiseen on lähtökohtaisesti yksilötason ilmiö. Yritystason tekijät, kuten rahoitus ja tarkasti määritelty ydinosaaminen, mahdollistavat halutun kansainvälistymisprosessin. Verkostotason tekijät, kuten asiakkaiden seuraaminen tai olemassa olevat verkostot ovat usein nopea kansainvälistymisen reunaehdot. Tämän lisäksi tutkimus osoitti, että ennalta arvaamattomat tapahtumat vaikuttavat usein edistävasti tai hidastavasti kansainvälistymiseen. Empiirisessä kirjallisuudessa käytettiin eniten born global -, vaihe- ja verkostoteorieita. resurssipohjaista ja tietopohjaista näkemystä käytettiin empiirisessä kirjallisuudessa yllättävän harvoin. Jatko-tutkimusta tarvittaisiin muun muassa tämän aliedustuksen syiden tutkimiseen.

Asiasanat	Kansainvälistyminen, tietointensiiviset yritykset, kansainvälistymisteoria
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**INTERNATIONALISATION OF  
KNOWLEDGE-INTENSIVE COMPANIES**  
**An analysis of theoretical and empirical literature**

Master's thesis  
in International Business

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# 1 INTRODUCTION

## 1.1 Knowledge-intensive companies and knowledge-intensity

The importance of knowledge-intensive companies in the world economy and their share of internationalising companies have been growing steadily for years. The rise of the ICT industry and the growing importance of biotechnology are two important contributors to this development. Consequently the changes in the international business environment have also resulted in growing scientific interest in the topic.

Between 1995 and 2008 the total volume of the exports and imports of goods and services in the OECD countries has risen from approximately 9 000 billion USD to 25 058 billion USD (factbook 2010). This tremendous growth underlines the importance of internationalisation research. Changing situations require revising of old research and creating of new theories.

The importance of ICT and other high-technology companies for the global economy and for national economies is very high. The average share of ICT companies of the total value added in the OECD countries in 2006 was 16%, but in some countries remarkably higher. In Finland the share is 32%, in Korea 29% and in Israel 41%. (OECD factbook 2010) This emphasises the need for research in the field of knowledge-intensive companies. Such high shares of the value added indicate that ICT companies are successful and that their importance for the economy is very high.

The type of company which this study addresses can be defined and labeled in many ways. Most commonly the terms knowledge-intensive company, technology company or high-technology company are used. For these companies, technology is an important competitive factor (Riggs 1983) or a major contributor to the company's innovation process (Burgelman and Maidique 1988).

Alvesson (1995) defines knowledge-intensive companies as companies, where work is mostly of **intellectual nature** and a majority of the workforce is **well educated**. Starbuck (1992) elaborates the concept in more detail. According to Starbuck, the concept of knowledge-intensive firms is derived from the distinction into capital- or labour-intensive firms. In this definition companies are categorised by inputs and knowledge-intensive firms are companies with knowledge as the primary input. Coviello (1994) defines knowledge-intensive companies as companies "*having a high added value of scientific knowledge embedded in both product and process*".

The definition of Coviello lacks the aspect of the usage of knowledge. Embedded scientific knowledge can be seen as a form of information, which according to Starbuck (1992) does not constitute a knowledge-intensive firm. Knowledge is rather expertise than information. A similar refinement to the definition is made by Winch and Schnei-

der (1993), who introduce the concept of **standardised intangibility**. Standardised intangibility means that the product of the knowledge-intensive company is on the one hand **intangible** and thus not a commodity, but on the other hand it is standardised to an extent which allows distinction from other products and trading.

Alvesson (1993) points out that knowledge-intensity is socially constructed, i.e. claims of knowledge-intensity are made by outside groups and the degree of knowledge-intensity lacks objective measures. Knowledge-intensive companies can be found among law and accounting firms, consulting companies, R & D units, advertising agencies and high-technology companies (Alvesson 2000).

Knowledge-intensive companies are often referred to as high-tech or high-technology companies. A distinction can be made between high-technology products and high-technology services. A significant share of the literature on high-technology lacks a satisfactory definition of the research subject. According to Viardot (2004), marketing managers of high-technology-companies define high-technology products as products which require a sophistic technology, are changed and upgraded frequently and are innovative for the market. This definition of high-technology is rather product-driven and market-oriented due to the viewpoint of marketing managers. High-technology can also refer to the companies' ability to control their value chain and create innovative distribution channels (Li, Ng and Gaber 2007). High-technology is thus not only limited to a company's outward operations, but also to its inner processes and capabilities.

The measurement of knowledge-intensity in general is challenging due to the intangible nature of knowledge. A rough measure is suggested by Almor, Harshai and Hirsch (2006), who measure knowledge-intensity as the ratio of the cost of specified knowledge in a product and the cost of the manufacturing of the product. The authors propose a ratio of 10% as a threshold for knowledge-intensive products. This measure is simple to use, but faces the danger of reducing knowledge-intensity to a product-level phenomenon. Additionally, an agreement on the issue of inclusion or exclusion of different costs is needed in order to maintain comparability of results. However, this issue remains at least partially unsolved by the authors.

In this study choosing a distinct definition of knowledge-intensive companies is omitted, because the aim is to acquire a broad view on the literature on the internationalisation<sup>1</sup> of knowledge-intensive companies. A narrow definition would decimate the

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<sup>1</sup> In this study internationalisation is defined as the inward or outward movement of a company's international operations (Welch and Luostarinen 1988), the planning of these operations and changes in ownership leading to an international company, such as foreign direct investments and mergers and acquisitions. A short overview of other definitions is given in Appendix b.



sample unnecessarily and reduce the explanatory power of the results. Being a literature review, this study relies on the definitions provided by the literature in question.

Knowledge-intensity on national level can be measured by R&D expenditures as percentage of GDP. In most countries, the share of R&D expenditures has been rising more or less constantly. The average annual growth rate of the share of R&D expenditures in GDP has been 3,6% for the EU-27, 16,0% for Russia, 16,4% for China and -2,5% for the USA (Eurostat 2008). Inside the EU the spread is very wide. The growth rate has been highest in former socialist economies, which is largely due to the economic transition after 2000. Despite the impressive growth figures, the highest percentages of R&D expenditures are in Sweden, Finland and Japan, all over 3 % of GDP (Eurostat 2008).

Knowledge-intensive companies have possibilities for growth figures, which are rarely found in traditional industries. As an example, the five fastest growing technology companies in the EMEA region have grown over 100-fold in five years. The recent developments presented above show that knowledge-intensity and knowledge-intensive companies represent a new and promising field for business research.

## **1.2 Research objective**

Internationalisation is a popular research subject and the amount of empirical literature in the field is impressive. As stated above, the volume and importance of international business activities are growing constantly. International business research aims at understanding the changes in the business environment and develops theories explaining them.

However, a lack of comprehensive studies including both theoretical and empirical approaches is evident. Most publications are based on a narrow theoretical framework and focus on a single case or a narrowly defined field or industry. Internationalisation literature in general builds heavily on earlier research and theories, making a thorough understanding of the literature an important asset for the researcher.

Internationalisation theories apply mostly to a wide range of different companies and industries. The theories are derived from general business theories and change approximately simultaneously with them. Theories concerned with knowledge-intensive companies are rare, mostly knowledge-intensive companies are not mentioned or they are merely examples highlighting certain theoretical features.

Due to the growing importance of ICT and other knowledge-intensive companies for many economies, a thorough investigation of the internationalisation of knowledge-intensive companies is of significant academic interest. Hence the objective of this study is to examine the internationalisation of knowledge-intensive companies by ana-

lysing relevant theoretical and empirical literature on the topic. The study is structured into two parts. The first part is concerned with theoretical literature on the internationalisation of knowledge-intensive companies, whereas in the second part empirical studies are examined. Conclusively, the theoretical and empirical findings are compared in order to identify similarities and dissimilarities.

The theoretical and empirical studies are examined with the purpose to reveal common themes and patterns in the literature and to develop an understanding of its development. In this study, pathways of ideas and theories are of particular interest. The development of paradigms and how researchers build on earlier work are important points of focus. The results of this study should enhance the understanding of the factors leading to and determining the process of the internationalisation of knowledge-intensive companies.

## 2 METHODOLOGY

### 2.1 Research method

In international business research, the most common methodological question is, whether to use quantitative or qualitative methods. The choice between qualitative and quantitative methods is based on many factors, among which the nature of the research problem is most important (Creswell 2009, 18). However, qualitative and quantitative methods are methods for empirical research and require narrow research questions (Eriksson and Kovalainen 2008, 38).

As stated in the previous chapter, this study does not aim at answering a tightly defined set of research questions. For this purpose, a literature review is more likely to result in usable findings. According to Eriksson and Kovalainen (2008, 44) the purpose of a literature review is to “*explore, summarise, compare, and critically analyse what has been written by other researchers about the topic of your research.*”

The choice of a literature-based thesis is justified with the purpose to develop a deep understanding of the literature related to the internationalisation of knowledge-intensive companies. Both theoretical review and research review (Cooper 1998, 3) were used in this study, allowing evaluation of earlier empirical research and determining the most suitable theories to explain the research subject.

Eriksson and Kovalainen (2008, 47) distinguish between two types of literature reviews: descriptive and evaluative. This study is evaluative and critical, because the literature is analysed and reorganised in order to produce new knowledge for a better understanding of the research topic.

The nature of this study is exploratory in its attempt to create a comprehensive understanding of the literature on the internationalisation of knowledge-intensive companies. Because the purpose of the study is not to test a certain theory or to fit findings in an a priori developed framework, a wide scope of internationalisation literature was examined in order to avoid misinterpretations based on a too narrow view on the literature. Mayler and Blackmon (2005, 11) distinguish between three types of research: basic, development and commercial. This study can be labeled as basic research, because the aim is to understand the internationalisation of knowledge-intensive companies in general without a defined application in practice.

The structure of the study is dyadic. First theoretical literature is reviewed, which is followed by empirical studies. The findings are further categorised according to criteria developed during the reviewing process. The structure of the study is portrayed in Figure 1.

The material was drawn from different sources. Fundamental theoretical literature has mostly been published in books, whereas empirical studies – and recently an increasing amount of theoretical work – is published in peer-reviewed scientific journals. Most of the literature reviewed in this study was published in journals, but, as expected, a significant share of the theoretical literature was published in books.

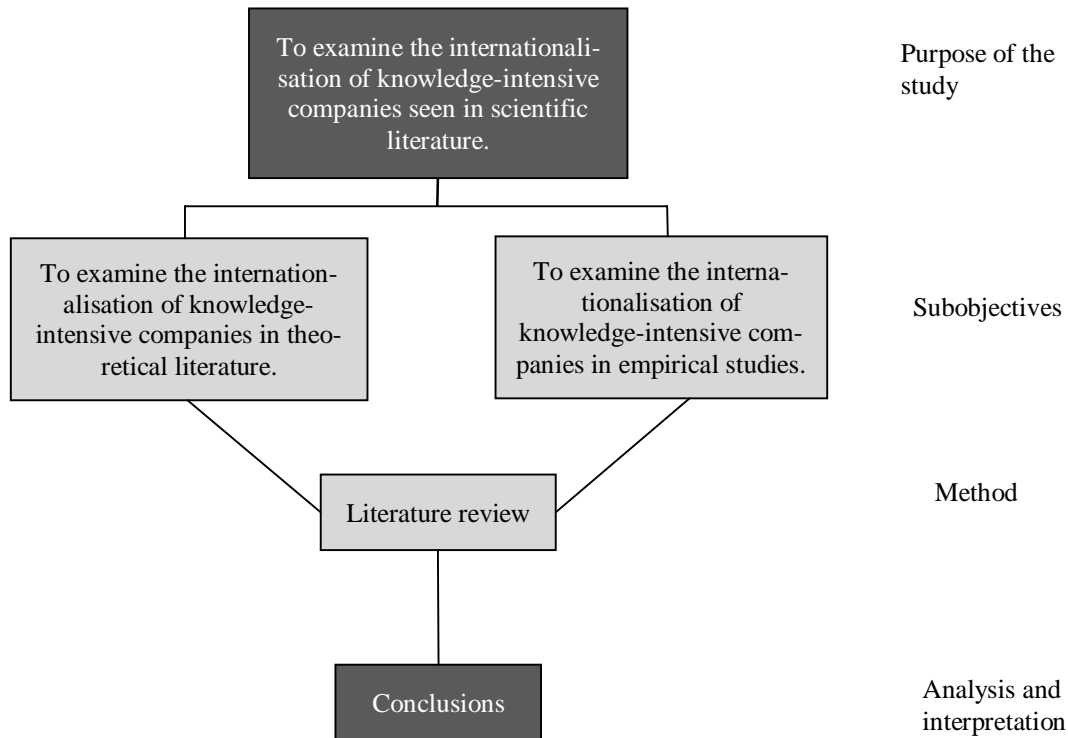


Figure 1: Structure of the study

The quality of the material reviewed was ensured by monitoring of specific research questions, valid data collection, appropriate methods and interpretations based on the data (Fink 2005). The quality of the publications reviewed was further ensured in two ways. In the case of older publications, their impact on later studies was examined by searching for citations of the publication in later studies on the subject or by searching for key words from the publication in later sources. In the case of recently published studies, the quality was examined by studying the use of well-established theories and concepts.

The data collection process involved various steps. First, important theories and publications were identified by searching for multiple occurrences in the references of later publications. Then the development of these theories and the reaction to them was stud-

ied by reviewing appropriate journals and other sources. This method requires a lot of work and is slightly opposed to methods using strictly defined criteria for reviewing and which are recommended by many British and American writers (for example Fink 2005), but for the purpose of this study it seemed appropriate and rendered good results.

The actual search for literature involved multiple steps. First, relevant theoretical literature was identified by reading textbooks on internationalisation theories. After identifying the most important theories, literature related to these theories was reviewed. Some of the literature was found by examining the references of current literature on internationalisation. Simultaneously, literature related to the internationalisation of knowledge-intensive companies was searched for in multiple databases, such as JSTOR, ABI/INFORM global, Business Source Complete and Emerald, using multiple keywords separately and combined in order to find all relevant literature. The most important keywords were *internationalisation/internationalization*, *knowledge-intensive*, *high-technology/high technology*, *biotechnology*, *software*, *ICT*, *nanotechnology*, *consulting*, *knowledge-based company*. The first key words were derived from the definitions of knowledge-intensive companies and the list was improved by adding key words from articles included in the study.

Searches in German and Finnish were also carried out using the equivalents of the English keywords, but the searches resulted in literature in English with German or Finnish keywords or translations of abstracts. It is evident that English is the prevalent language in internationalisation research and that the credibility of the study is not impeded by concentrating on literature in English.

These searches rendered an amount of literature, which allowed for first analyses and a preliminary grouping of results, but which was still insufficient. Additional literature was gathered by tracking the development of important publications in later research. This was done by searching for citations of older publications in all journals available in the university web portal. This search was continued with the references of this study in a roughly chronological order, until additional searches rendered new literature only sporadically. At this point the assumption was made that the sample was saturated and further searching would be futile. However, searches with the keywords listed above were repeated in order to minimise the possibility of human errors and omissions in the searches.

The decision, whether to include a specific article in the study, was not always obvious. In most of the cases it was clear, whether the article deals with knowledge-intensive companies or not. Some articles, however, dealt for example with both software and manufacturing companies. Studies including other than knowledge-intensive companies were included only in cases discussing them as a separate entity. Some articles were first included in the sample, but later rejected on the grounds of poor quality or a too weak linkage to knowledge-intensive companies. The rejection rate was high,

because a majority of the articles were concerned with other than knowledge-intensive companies. Between one fourth and one third of the articles reviewed were analysed in this study.

This study concentrates on literature published between 1992 and 2011. Older publications were not reviewed for three reasons. Firstly, business research develops at a considerably fast pace and results can become outdated fairly quickly. However, scientific literature is always based on earlier literature, so it is reasonable to study a longer timeframe.

Secondly, setting a timeframe is beneficial for the scope and comprehensiveness of the study. Since a master's thesis is limited in both length and time of preparation, a better result can be achieved by focusing on a definite period of time.

Thirdly, and most importantly, having a timeframe is related to theoretical and research issues. The preliminary search process for literature rendered an article published in 1992 as the first publication with relevance to knowledge-intensive companies. Based on this finding, 1992 was defined as the chronological starting point in the empirical literature.

Empirical literature relies on theoretical literature and the theoretical literature on internationalisation corroborates the decision to take the year 1992 as a starting point. Theories of internationalisation before the 1990s were mostly concerned with big, mostly manufacturing companies and knowledge was not incorporated as a determinant of internationalisation. The most prominent example is the Uppsala model (Johansson and Vahlne 1977). In the 1990s the resource-based view of the firm and internationalisation (RBV) emerged and knowledge as a resource became a field of interest. Consequently, knowledge-intensive companies appeared in scientific publications.

As the knowledge-based view of internationalisation was formulated in the 1990s, the presence of knowledge-intensive companies in the literature grew further. According to Alvensson (1993), the interest in knowledge-intensive companies emerged largely in the first years of the 1990s. The emergence of knowledge-intensive companies in the business literature may have several reasons. Without a doubt substantial changes in many industries have taken place, which has amplified the importance of knowledge. However, some of the popularity of knowledge-related literature may be due to the fact that knowledge can be very easily and not always justifiably incorporated in the work of scientists and consultants (Alvensson 1993).

The theoretical part of this study is constructed with a chronological logic in order to understand the development in the literature. The aim is to first identify relevant and important theories and then follow their effects on later research. The study was carried out with the underlying assumption that scientific discourse on a specific topic develops as a dialogue of authors reviewing earlier work of others and developing their ideas further.

Related to this is the concept of paradigms, proposed by Kuhn (1962, for reference see Kuhn 1996). While acknowledging that the philosophy of science is outside the scope of this master's thesis and that the model of paradigmatic development of science is disputable, the idea of evolving and changing paradigms is still born in mind while conducting the literature review. It might be helpful in order to understand and identify the causes for certain developments in the field of internationalisation literature.

The focus of the theoretical literature reviewed was wider than the focus of the empirical literature due to the scarcity of theoretical literature on knowledge-intensive companies. Internationalisation theories were examined on a wider scale but with the aim to focus on knowledge-related issues.

The amount of empirical literature on the internationalisation of knowledge-intensive companies substantially exceeds the amount of theoretical literature. This is in accordance with the tendency of international business research to emphasise empirical research. In the following section a brief overview of the empirical literature reviewed in this study is presented.

The sample of empirical literature in this study consists of 68 articles published mostly in scientific journals and two doctoral dissertations. The publications were issued between 1992 and 2011. As presented in Table 1, the internationalisation of knowledge-intensive companies is a fairly recently discovered research topic, half of the literature reviewed in this study has been published after 2005.

Table 1: Chronological distribution of the literature analysed

Year	1992	1994	1996	1997	1999	2000	2002	2003	2004
Number	1	1	1	1	3	3	3	5	7
Year	2005	2006	2007	2008	2009	2010	2011		
Number	2	10	6	11	9	4	2		

Table 1 shows clearly that throughout the 1990s research on the internationalisation of knowledge-intensive companies was very scarce. In fact, the first article in the sample dealing explicitly with knowledge-intensity was published in 2000. The number of publications per annum was very low throughout the 1990s until 2004. The development in number of publications is in line with the growing importance and number of knowledge-intensive companies, especially IT-related companies, in the 2000s. The significant rise in the number of publications after 2003 may also be of academic nature. The dissertations of Saarenketo and Kuivalanen were published in 2002 and 2003 and both seem

The reviewed articles were published in 37 different journals with a wide thematic range. Most journals are based on marketing, entrepreneurship, management and corporate change, but also on technological and engineering management. Surprisingly, only

one article was published in a journal dealing exclusively with SMEs, *Small Business Economics*. The wide thematic range of the journals provides a multifaceted understanding of the internationalisation of knowledge-intensive companies. Table 2 presents the journals which provided three or more articles to this study. A full list of journals incorporated in this study is given in Appendix a. The fact, that 29 of the 37 journals rendered less than three results, shows that research on the internationalisation of knowledge-intensive companies is still a small discipline. Most articles were published in entrepreneurship, marketing, management and general business journals, which may result in an emphasis on marketing-related and entrepreneurial issues in the results.

Table 2: Prevalent journals in the analysed literature

Name of Journal	Number of articles published
Journal of International Entrepreneurship	6
Journal of International Marketing	5
International Marketing Review	4
Journal of World Business	4
Management International Review	3
International Business Review	3
Journal of Euromarketing	3
Journal of International Business Studies	3

Another important issue in the reviewed articles is the variety of company types covered. Due to the broad definitions of knowledge-intensive companies, a wide range of industries can be covered in this study. Table 3 shows, how often and by which authors different company types have been analysed in the 68 articles reviewed.

The definitions of the company types are adopted directly from the articles in question. It is important to bear in mind that the numbers do not reflect the number of companies studied in each industry, but the number of articles dealing with the industry. Accordingly, the table does not give information on the distribution of knowledge-intensive companies across different company types, but rather the degree of scientific interest towards each type.

Table 3 depicts clearly the emphasis on ICT and software companies in the literature on the internationalisation of knowledge-intensive companies. More than half of the articles reviewed include ICT or software companies. High-technology, biotechnology and pharmaceutical companies are also fairly popular research subjects. Surprisingly, online retailing and e-commerce companies as well as business-to-business consulting companies have been studied scarcely. A reason for the absence of online retailing companies in the literature might be that replacing a physical store with a website does not necessarily meet the definitions of knowledge-intensive companies.



Table 3: Company types examined in the analysed literature

Company type	Number	Authors
ICT and software companies	40	Almor, Hashai and Hirsch (2006); Andersson and Wictor (2003); Arenius, Sasi and Gabrielsson (2006); Bell, Crick and Young (2004); Bishop (2008); Chandra, Styles and Wilkinson (2009); Chetty and stangl (2010); Coviello (1996); Dib, Rocha and Silva (2010); Gabrielsson and Gabrielsson (2003); Gabrielsson, Kirpalani, Dimitratos, Solberg and Zucchella (2008); Garvey and Brennan (2006); Gemser, Brand and Sorge (2004); Ibeh and Kasem (2011); Ha, Choi and Jung (2008); Johnson (2004); Kuivalainen, Kyläheiko, Puumalainen, and Saarenketo (2002); Kuivalainen, Lindqvist, Saarenketo and Äijö (2006); Kuivalainen, Puumalainen, Sintonen and Kyläheiko (2010); Kyläheiko and Kuivalainen (2008); Lindqvist, Kuivalainen and Saarenketo (2011); Lopez (2009); Moen, Gavlen and Endresen (2004); Niosi and Tschang (2009); Nummela, Saarenketo and Puumalainen (2004); Ojala (2009); Ojala and Tyrväinen (2006); Ojala and Tyrväinen (2007); Ojala and Tyrväinen (2008); Ojala and Tyrväinen (2009); Reuber and Fischer (1997); Ruokonen and Saarenketo (2009); Ruokonen, Nummela, Puumalainen and Saarenketo (2008); Saarenketo (2003); Saarenketo, Puumalainen, Spence and Crick (2006); Sasi and Arenius (2008); Styles and Genua (2008); Terjesen, O’Gorman and Acs (2008); Zaby (1999); Zain and Ng (2006)
Other high-technology companies	17	Aspelund and Moen (2004); Burgel and Murray (2000); Crick and Jones (2000); Crick and Spence (2005); Filatotchev, Liu, Buck and Wright (2009); Fryges (2009); Jolly, Alahuhta and Jeannet (1992); Gabrielsson, Kirpalani, Dimitratos, Solberg and Zucchella (2008); Ha, Choi and Jung (2008); Jones (1999); Laanti, Gabrielson and Gabrielsson (2007); Lin, Cheng and Liu (2009); Loane and Bell (2006); Loane, McNaughton and Bell (2004); Mort and Weerawardena (2006); Saarenketo, Puumalainen, Kuivalainen and Kyläheiko (2008); Tyebjee (1994)
Electronics companies	6	Almor, Hashai and Hirsch (2006); Autio, Sapienza and Almeida (2000); Bell, Crick and Young (2004); Chandra, Styles and Wilkinson (2009); Johnson (2004); Spence and Crick (2006)
Online retailing and e-commerce companies	5	Forsgren and Hagström (2007); Gemser, Brand and Sorge (2004); Kim (2003); Luo, Zhao and Du (2005); Rothaermel, Kotha and Steensma (2006)
Business-to-business consulting companies	4	Coviello and Martin (1999); Forsgren and Hagström (2007); Gabrielsson, Kirpalani, Dimitratos, Solberg and Zucchella (2008); Gemser, Brand and Sorge (2004)
Telecommunication	2	Almor, Hashai and Hirsch (2006); Chandra, Styles and Wilkinson (2009)
Biotechnology companies	2	De Mattos and Cross (2003); Zaby (1999)
Financial services	1	Forsgren and Hagström (2007)

The hegemony of software and other ICT companies in the literature seems to have two reasons. Firstly, most of the articles reviewed are based on research done in the past ten years, a decade in which information and communication technologies have developed significantly and had a major impact on the way of conducting business. Secondly, the high number of articles dealing with ICT companies in the articles reviewed has methodological reasons. ICT companies are often seen as the archetype of knowledge-intensive companies, because they fit into every definition. In single case studies, researchers strive to select a representative case with the highest possible amount of typical characteristics of the population. With knowledge-intensive companies as the population, ICT companies are a convenient choice.

Categorised by size, SMEs dominate the literature on the internationalisation of knowledge-intensive companies. 34 out of 68 articles focus on explicitly on SMEs, whereas only 3 focus on MNEs. The remaining articles lack a focus on a specific company size. The observed emphasis on SMEs is in strong contrast with common perceptions of internationalisation research. Many researchers argue that research on SME internationalisation is important on the grounds of the prevalence of research on MNEs and that the SMEs have only recently attracted academic interest (see for example Ruzzier, Hisrich and Antoncic 2006).

In the light of the sample used in this study, the alleged scarcity of research on SME internationalisation seems exaggerated. On the contrary, MNEs were studied in only three articles, which reflects the characteristics of knowledge-intensive companies being often small- and medium-sized. Surprisingly, a significant share of the literature was published in Finland or by Finnish authors. A definite explanation for this phenomenon could not be found. A simple researcher bias is implausible, since the literature search was not geographically restricted. A more likely explanation is the development of the knowledge-based view by Finnish authors and the interest in SME internationalisation stemming from the small domestic markets. Unlikely to bigger economies, such as the United States, SMEs in smaller economies often face the issue of underdeveloped home markets.

Methodologically, there is a fairly even spread of quantitative and qualitative methods in the sample. Quantitative methods are used in 26 articles, qualitative methods in 35 articles and mixed methods in five articles. In three cases the method is unclear or insufficiently elaborated. Gabrielsson and Gabrielsson (2003) claim to have a conceptual or analytical approach, but the authors seem to base their work on empirical findings. Jones (1999) used a questionnaire, but the article lacks a clear explanation of the methods employed. Coviello (1996) uses a method which can be described as descriptive.

The research was carried out in a time span of 14 months with varying intensity. All steps in the research process were deliberated without haste and carried out meticulous-

ly in order to insure a constant quality of the study. In the next chapter, the trustworthiness of the study is examined.

## 2.2 Trustworthiness of the study

The evaluation of the trustworthiness of a study is an important part of the research process for two purposes. For the researcher the evaluation gives a feedback on the success of his work and for the reader it is important to be able to judge, how reliable and usable the results of the study are.

The most commonly used concepts in the evaluation of empirical research are reliability and validity. Reliability refers to the consistency of the study and to the degree of repeatability (Hirsjärvi, Remes and Sajavaara 2001, 214–215). Validity is concerned with questions regarding the accuracy of methods and can be enhanced by concentrating on logical analysis and careful data gathering. However, the concepts of reliability and validity are not as such applicable to the evaluation of a literature review.

A method for the evaluation of literature reviews is presented by Boote and Beile (2005). The authors use the following five categories to evaluate a literature review: coverage, synthesis, methodology, significance and rhetoric. For the sake of comprehensiveness and clarity, the numeric scale used by Boote and Beile (2005) is not used in the evaluation of this study.

Coverage is defined as justified criteria for inclusion and exclusion from the review. In this study, the primary criterion was that the literature should deal with knowledge-intensive companies. The second category, synthesis, comprises of six claims. A study should distinguish, what has been done from what has to be done, place a topic in the broader scholarly literature, place the research in the historical context of the field, acquire and enhance the subject vocabulary, articulate important variables and phenomena related to the topic and synthesise and gain a new perspective on the literature.

In this study the emphasis was on what has been done, but suggestions for further research were also made. The broader scholarly literature perspective is not strongly present in this study<sup>2</sup>. The historical context was taken into account by studying the historical development of internationalisation theories. Subject vocabulary was used and key concepts were explained, but ambiguities in definitions were not specifically addressed. Relationships between important phenomena were discussed, but no important new relationships were proposed. Overall this study offers a new perspective on the literature, starting from its purpose.

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<sup>2</sup> The criteria of Boote and Beile (2005) are designed for the evaluation of a doctoral thesis, which obviously has to be of a greater depth and length.

Methodology refers to identifying main methodologies and research techniques used in the field, as well as their advantages and disadvantages, and furthermore to relating ideas and theories to research methodologies. In this study, methodologies were discussed, as well as their appropriateness.

Significance is defined as rationalising the practical and scholarly significance of the research topic. Both were discussed to some extent in this study. Rhetoric refers to a clear, coherent structure supporting the review. This study can be seen as well developed and coherent.

When evaluated according to the criteria of Boote and Beile (2005), the overall trustworthiness of this study seems good, which means that the results can be used by other researchers as a starting point for further research. Nevertheless, as in every case, there is a possibility of misinterpretation and unintentional omissions. One possible bias is the strong representation of Finnish authors. However, as stated in the previous chapter, the reason for this overrepresentation is more likely to be in the literature than in a simple researcher bias. Although every step in the research process was done with the aim to produce coherent, reliable research, the results should be seen as only one justifiable interpretation of reality. Different company types from different industries in countries worldwide were broadly represented in the sample.

### **3 INTERNATIONALISATION THEORIES AND KNOWLEDGE-INTENSITY**

#### **3.1 Historical development of internationalisation theories**

Literature on internationalisation is abundantly available and the range of approaches and viewpoints is considerably high. The impressive amount of literature requires a brief overview of internationalisation paradigms and theories, before relevant theories are considered in more detail. Traditionally internationalisation theories have been grouped according to their focus on SMEs or MNEs. Earlier theories were mostly based on MNEs, whereas SMEs have become a popular area of interest later.

Internationalisation has been defined in multiple ways. One way is to define internationalisation as increasing a company's involvement in foreign markets (for example Johanson and Vahlne 1977) or the inward or outward movement of the firm's international operations (Welch and Luostarinen 1988; 1993). This type of definition arises from a narrow and mechanical perception of internationalisation focusing on the firm's internal operations and on exporting as the main mode of internationalisation. Consequently, these definitions lead to models emphasising internationalisation as a process and its incremental nature.

Early internationalisation theories were to a significant extent based on economics and viewed internationalisation as a part of other business activities of a large company. Since theories focusing mostly on MNEs are not as such applicable to a significant share of the companies considered in this study, only the most influential one – the eclectic paradigm (Dunning 1977) – is presented.

The eclectic or OLI (ownership, location and internalisation) paradigm is based on ownership, location and internalisation advantages. The paradigm is commonly seen as a tool for the understanding of FDIs and international activities of MNEs. The first sub-paradigm states that the greater a firm's competitive advantage related to ownership is, the more likely the company is to increase foreign production. Examples of ownership-related factors are the possession and exploitation of monopolistic power (see for example Caves 1971), the possession of resources and capabilities and the competencies of managers to exploit resources globally. This sub-paradigm is based among others on Bartlett and Ghoshal's (1993) work. The second sub-paradigm refers to locational advantages of countries in the geographical distribution of FDIs (Dunning 1998). The third sub-paradigm is related to the competitive advantage, which firms can obtain by internalising foreign operations. It is commonly argued that internalisation is most profitable in markets with imperfections (Dunning 2000).

Because the eclectic paradigm (Dunning 1977) was designed in order to explain the internationalisation of MNEs and because internationalisation is only one part of the theory, it is fruitful to examine other theories in order to understand the internationalisation of knowledge-intensive companies. Theories explaining internationalisation, which took the company's environment in account and had a knowledge component, were produced by the so-called Nordic school. Its influence has been strong since the 1970s. Although the most prominent theory in the Nordic school, the Uppsala model, is also based on MNEs, it has had a major influence on SME internationalisation research. The strong representation of SMEs especially in theories developed in Scandinavia may also be due to the small economies, which force small companies to internationalise.

Despite the success of the Uppsala model its increasing lack of explanatory power in many cases became apparent and required adjustments, which resulted in the network model of internationalisation. In brief, the network model argues that internationalisation is a company's interaction with firms operating in a foreign network (Johanson and Mattsson 1988). The network model avoids the problems related with psychic distance in market selection.

At the time of the development of the network model, management research produced the resource-based view of the firm (RBV), which is based partially on a mindset very similar to the Uppsala model. The focus is on the company's internal resources and processes and knowledge is a decisive factor (see for example Barney 1991). The RBV has in the last two decades been successfully applied to internationalisation and augmented with the dynamic capabilities approach (Eisenhardt and Martin 2000).

Whereas the RBV is strongly rooted in earlier theories, the concept of international new ventures (INV) or born globals emerged more on the grounds of observations of changes in internationalisation patterns. INV theory argues that the internationalisation process of many companies, often knowledge-intensive firms, does not follow the traditional pattern, but instead the companies are international from inception. The INV concept has produced a remarkable amount of studies and is being constantly tested and modified. The conceptual framework of Zettinig and Benson-Rea (2008) which explores the theoretical constituents of international entrepreneurship, an extension of INV, is an example of recently published work on INVs.

Comprehensive syntheses of internationalisation theories are scarce and most of the available literature is based on distinct, single theories. The following chapters present the most influential internationalisation theories more elaborately and from the perspective of knowledge-intensive companies.

### 3.2 Stage models

The most prominent theory in the field of internationalisation theories is the Uppsala model (Johanson and Wiedersheim-Paul 1975, Johansson and Vahlne 1977), according to which internationalisation proceeds gradually from physically and psychically close markets to more distant markets, as the company's knowledge-base grows. Although the perception of internationalisation as an incremental process has been criticised and mostly rejected by later research, the fundamental logic and the importance of learning and knowledge have resulted in the fact that the Uppsala model has had a significant effect on later research.

The Uppsala model assumes that there are four different entry modes representing stages of international involvement. According to Johanson and Wiedersheim-Paul (1975), the stages are: No regular export activities, export via independent representatives (agents), establishment of an overseas sales subsidiary and overseas production/manufacturing units.

This approach has its roots in the behavioural theory of the firm (Cyert and March 1963). Cyert and March challenged the established view in economics that firms always strive to maximise their profits. According to them companies rather adapt their behaviour to their environment. Companies' goals can vary on a wide scale according to their goals. The main contribution of the behavioural theory to internationalisation theories is the fact that companies as organisations are not mechanical or rigid, but all decisions are made by individuals, whose behaviour determines the company's actions.

Following the behavioural approach, the Uppsala model presents internationalisation as a cycle, in which general and experiential knowledge and resource commitment affect decisions on current business activities and market commitment (see Ruzzier, Hisrich & Antoncic 2006 and Andersen 1993). The cycle is portrayed in Figure 2.

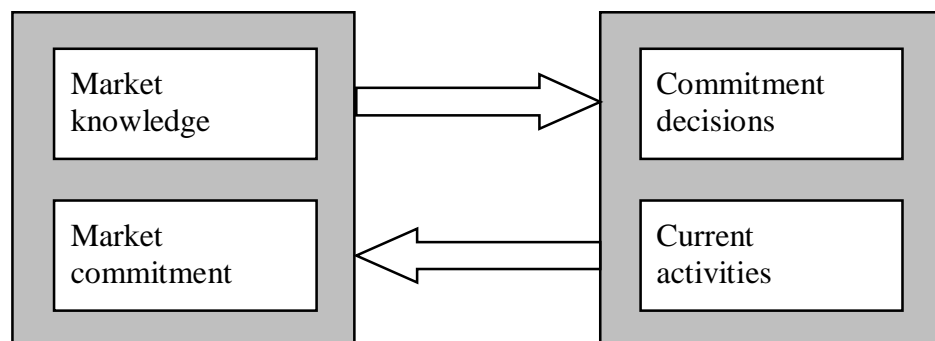


Figure 2: Market commitment cycle. Source: Johanson and Vahlne (1977)

The Uppsala model assumes that learning, i.e. the acquiring of internationalisation knowledge is achieved through the interaction of current activities, market commitment, market knowledge and commitment decisions. Market commitment adds to the market knowledge of a company, which in turn affects commitment decisions. Current activities are determined by commitment decisions. By the completion of the cycle in one market, the company has acquired enough internationalisation knowledge to enter a market of greater psychic distance. This leads to the gradual increasing of international involvement, which is characteristic to the Uppsala model (Ruzzier et al. 2006).

According to Campbell-Hunt and Chetty (2011) the essential content of the Uppsala model can be depicted as a learning cycle, in which positive feedback from one stage leads to a new cycle in the next stage of internationalisation (Figure 3).

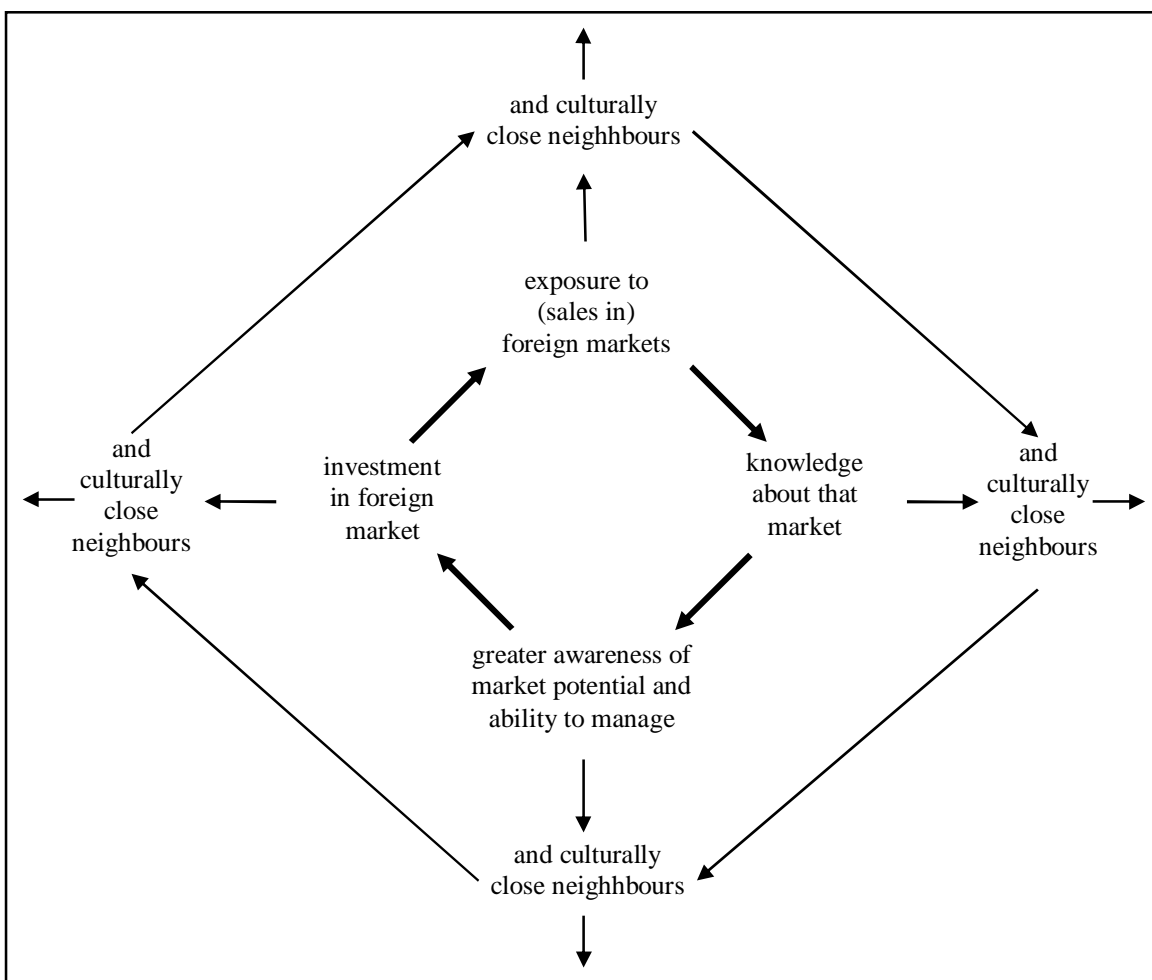


Figure 3: Learning cycles in the Uppsala model. Source: Campbell-Hunt and Chetty (2011)



The inner loop represents the learning in one market and the stages of internationalisation in that particular market. Sales in foreign markets lead to market knowledge, which results in awareness of market potential and a greater ability to manage operations in the market. These factors lead to investments in the particular foreign market<sup>3</sup>. The new investment starts another learning cycle intensifying the commitment of the company in the market. The outer loop in the learning cycle model represents the effects of the first learning cycle to the spatial internationalisation pattern of the company.

Andersen (1993) points out that Johansson and Vahlne have omitted the definition of preconditions for the learning cycle as well as any consideration of factors which might influence the cycle. An additional drawback of the Uppsala model is that it assumes that every internationalising company pursues growth and that companies strive to keep risk at a low level (Johanson and Vahlne 1977). As will be seen later in this study, these assumptions are in strong contrast to the current characteristics of internationalising companies.

A slightly broader definition of internationalisation is suggested by Calof and Beamish (1995), who – building on former definitions used among others by Johanson and Vahlne – define internationalisation as adaptation of operations to international environments. In the Uppsala model, internationalisation can be seen as an outcome of activities within the company, but in this view the environment of the firm and its adaptation to international environments is the key factor facilitating internationalisation. According to Calof and Beamish (1995) growth is not a necessary condition for internationalisation; a company can for example divest or drop product lines in the course of internationalisation. This view of internationalisation is less market- and product-oriented and focuses more on the company's operations.

The Uppsala model conceptualises internationalisation on the grounds of stages of market entry and commitment. With time it has become evident that the internationalisation behaviour of companies varies significantly and that the model has to be refined. Anderson, Graham and Lawrence (1998) propose a stage model of internationalisation which is based on learning. Internationalisation is divided into five learning stages: aspirational, procedural, behavioural, interactional and conceptual.

The aspirational stage is characterised by a desire to internationalise and the understanding of the decision process. In the procedural stage the decisions are implemented and structural changes take place. Knowledge and skills are developed in order to benefit from the changes. The behavioural stage requires awareness of new conditions, generative learning and revision of dominant logic. In the interactional stage the company

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<sup>3</sup> The learning cycle highlights one of the drawbacks of the Uppsala model. It assumes that market knowledge leads to investment. The model does not take into account that learning can result in the conclusion, that certain markets are unfavourable for investments.

builds close relationships with existing and new stakeholders. Finally, in the conceptual stage the formation of an international mindset and a constant rethinking of operations takes place. (Anderson et al (1998)

The strength of this model is in its avoidance of too strictly defined stages. Because the stages are stages of learning and not stages of behaviour, the framework can be applied to different types of companies and situations. However, the order and importance of the five stages is subject to the same criticism as the Uppsala model.

In retrospect, the influence of the stage models on the emergence of knowledge-intensity in internationalisation research appears essential. Despite its drawbacks, the Uppsala model introduced the concept of learning as an important component of internationalisation. Because the model was originally developed in the 1970s, it would be anachronistic to assume that the internationalisation of knowledge-intensive companies would fit into the Uppsala model. The model of Anderson, Graham and Lawrence takes a significant step towards an understanding of the role of knowledge in internationalisation. Learning is seen as a prerequisite of internationalisation and as a crucial part of the whole internationalisation process.

### **3.3 Network model**

As a response to the critique on the Uppsala model, the network model of internationalisation emerged in the late 1980s (Johanson and Mattsson 1988). The network model shifts the focus of internationalisation from a procedural perspective to internationalisation as a network activity. The observation that firms were entering psychically distant markets very early in their internationalisation led the researchers to rethink the nature of internationalisation and to focus on the relationships between companies as bridges to new markets (Johanson and Vahlne 1990). Due to its new perspective, the network model proposes a new definition of internationalisation. According to Johanson and Mattsson (1988), internationalisation is interaction with a firm which belongs to a network operating in a foreign country. This definition is applicable not only to traditional modes of internationalisation, i.e. exports or imports, but also to licensing, strategic alliances etc.

A review of the literature reveals an apparent lack of consensus among researchers on the network relationships and their nature. However, it can be stated, without going further into detail in the debate that an agreement on the existence of formal and informal relationships exists. Formal relationships are related to business activities, informal relationships are formed between family members and friends (see for example Coviello and Munro 1995). Oviatt and McDougall (2005) add so-called brokers to the network relationships. Brokers are intermediaries establishing connections between buyers and

sellers. Brokers enable indirect ties and are helpful in establishing a wide network saving time and efforts.

The network model builds on the Uppsala model and thus shares at least some of its flaws. In their introduction to networks in international business, Forsgren and Johanson (1992) establish a clear link between the network model and the process-oriented nature of the Uppsala model. In this mindset, knowledge, or the lack of it, is seen as a barrier to internationalisation.

Despite its drawbacks, the network model has been continuously and fruitfully applied to different types of companies in many studies. Johanson and Vahlne (2003) present a modified network model of internationalisation which takes into account the developments in international business research in the past two decades. The perception of country borders as barriers in the internationalisation process has been replaced by network- and company-specific barriers which the internationalising company has to overcome. In this model, the interaction of experiential learning and commitment is still valid, but the learning is based on relationships rather than countries and markets.

The relevance of the network model to the internationalisation of knowledge-intensive companies is up to debate. Knowledge is not in the focus of the network model and its role in the internationalisation process is not further elaborated. In order to be better applicable to knowledge-intensive companies, the network model should be complemented with statements to the role of knowledge in network building.

### **3.4 Resource-based view and dynamic capabilities**

Theories of internationalisation are closely related with general theories of company performance, because most companies are not restricted to one country in their operations. One of the most influential theories relevant to this study is the resource-based view of the firm, to which among others Barney (1991) and Prahalad and Hamel (1990) have contributed. The emergence of RBV can be seen as one of the most influential theoretical developments in internationalisation literature after the Uppsala model and related stages models. The resource-based view emerged with the publication of a special issue of the *Journal of Management* (1991, Vol. 17) containing among others the works of Barney and Conner (see below).

The RBV focuses on the firm's internal processes and resources. Companies strive to create sustainable competitive advantage, which can be developed by using resources which are valuable, rare, inimitable and nonsubstitutable (Barney 1991). Sustainable competitive advantage is the determinant of success in RBV. In a simplified sense, the optimal use of resources enables persistent above-normal earnings (Conner 1991).

In the sense that learning is one way to build resources, the RBV comes close to the Uppsala model of internationalisation, which is built on the assumption that growing knowledge triggers internationalisation. Resource-based models of internationalisation also emphasise the importance of knowledge-based resources as a source of competitive advantage, instead of relying on tangible resource ownership (Ahokangas 1998).

RBV has had a major impact on business and international business literature. According to Peng (2001), the resource-based view has been cited in remarkably numerous studies since its emergence and that its popularity is due to its theoretically unifying nature. The RBV is a framework which can incorporate many different research topics into the same underlying logics. Peng (2001) points out that the contribution of international business to the resource-based view is the recognition of international knowledge as a resource resulting in competitive advantage. This leads to the assumption that RBV is a useful framework in the study of knowledge-intensive companies.

Critics of the RBV have argued that the framework paints an unnecessarily static picture of company performance and extended the framework to dynamic markets. Teece, Pisano and Shuen (1997) argue that the RBV fails to recognise the competitive advantage created by product market positioning and focuses too much on the firm's internal resources. Dynamic capabilities can be defined as processes and routines, which use resources to create competitive advantage (Eisenhardt and Martin 2000) or as a firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments (Teece et al. 1997). A comprehensive definition of dynamic capabilities is proposed by Barreto (2010, 271):

*“A dynamic capability is the firm's potential to systematically solve problems, formed by its propensity to sense opportunities and threats, to make timely and market-oriented decisions, and to change its resource base.”*

The definition of Barreto integrates both the source and the effects of dynamic capabilities.

Dynamic capabilities are generated through experience accumulation, but also and more importantly through deliberate processes. Knowledge articulation and codification (discussions, written processes) lead to stronger dynamic capabilities than non-articulated experience. (Zollo and Winter 2002.) According to Teece et al. (1997), dynamic capabilities are a source of competitive advantage and thus explain firm-level success. This view is criticised by Eisenhardt and Martin (2000, 1106), who argue that *“dynamic capabilities are necessary, but not sufficient, conditions for competitive advantage.”* The success of a company does not rely on the dynamic capabilities, but rather on the resource configurations developed using dynamic capabilities. This view positions the dynamic capabilities approach as an extension of the RBV rather than an independent theory.

The dynamic capabilities -view is a better tool for the understanding of companies' actions in their environment and can better explain the dialogue between a company and its environment, whereas the RBV focuses more on the company's internal organisation. The dynamic capabilities view is well suited for the study of knowledge-intensive companies, since it was developed in order to satisfy the need for a new paradigm explaining how competitive advantage is achieved in technology-intensive industries (Teece, Pisano and Shuen 1997). Knowledge-intensive companies rely on the accumulation or creation of knowledge in order to be successful. The ability to derive profit from knowledge is one of the core competencies of knowledge-intensive companies. The dynamic capability view is a theory explaining the development of competitive advantage through knowledge creation.

### **3.5 Born globals and international new ventures**

A further theoretical field which has to be considered when studying knowledge-intensive companies, deals with international new ventures or born globals. The concept of international new ventures emerged in the late 1980s and a first theoretical attempt to define the concept was made by Oviatt and McDougall (1994). According to Oviatt and McDougall, INVs are companies with the purpose to gain competitive advantage from international operations from inception, not just in later stages of company development. The focus is on value added rather than assets owned.

The INV approach incorporates elements from internationalisation theories and entrepreneurship research, simultaneously challenging some fundamental assumptions of both (Aspelund and Øystein 2007). Entrepreneurial research is traditionally domestically oriented and many internationalisation theories are based on stages, the INV approach has a new perspective.

According to Aspelund and Øystein (2007), the most important characteristics of INVs are international marketing strategies and the founding process of the company. International marketing strategies are mostly focused on rapidness of internationalisation, focused niche markets, limited importance of geographical and psychical distance and low commitment entry strategies. The founders of INVs have commonly earlier international experience, which facilitates the fast pace of internationalisation. Organic and flexible organisational structures add to this (Zahra 2005).

An early attempt to establish an understanding of INVs was made by Jolly, Alahuhta and Jeannette (1992)<sup>4</sup>, who studied the global strategies of high-technology start-ups. This study is influential as one of the earlier publications challenging the focus on large multinationals at the time and more importantly it links the INV approach to knowledge-intensive companies. The driving force behind most global high-technology start-ups is the founders' strong a priori vision of a global strategy, which is strongly opposed to the traditional view of internationalisation as a means of growth when domestic markets are saturated. Other mentioned success factors are innovative products based on industry shifts and broad and rapid market access.

Some researchers, for example Knight and Cavusgil (1996, 2004, 2005) refer to INVs as born globals. Knight and Cavusgil (2004) base their understanding of born globals on the resource-based view of the firm. The theoretical foundations of the authors' born global theory is close to the INV theories to a point that the concepts can be used interchangeably. The authors argue that born globals are innovative companies, whose most important dynamic capabilities arise from knowledge created in the innovation and internationalisation processes.

Knight and Cavusgil (2005) develop a taxonomy of born globals based mainly on Michael Porter's (1980) generic strategies: differentiation, focus and cost leadership. Four clusters are identified: entrepreneurial strategy and technology leaders, high-technology focusers, entrepreneurs emphasising cost leadership and poor performers. Knowledge-based companies are most likely to be found in the first two categories. The focus in both clusters is on competitive products and mostly high R&D investment levels.

Andersson and Wictor (2003, 254) refine the concept of born globals for small open markets, arguing that it is important to include a measure for the time between inception and internationalisation, and propose the following definition:

*“A born global is a company that has achieved a foreign sales volume of at least 25% within three years of its inception and that seeks to derive significant competitive advantage from the use of resources and the sales of outputs in multiple countries.”*

According to Andersson and Wictor, born globals are influenced mainly by four groups of factors, which are presented in Figure 4.

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<sup>4</sup> Although the paper by Jolly, Alahuhta and Jeannet contains an empirical analysis, it is included also in this theoretical chapter due to its importance to the formation of INV theory.

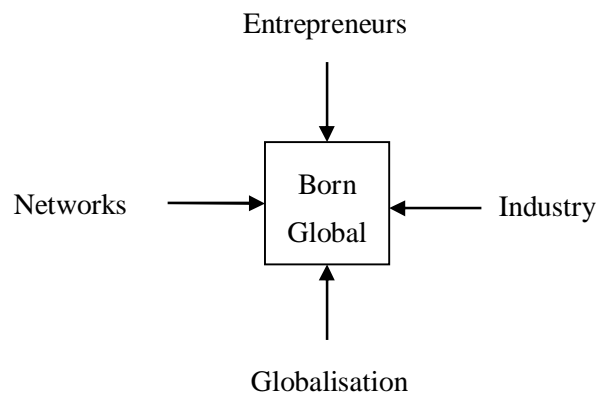


Figure 4: Factors influencing born globals. Source: Andersson and Wictor (2003, 254)

Globalisation – decreasing trade barriers, development in communication and transportation technologies and global marketing demand – facilitates the emergence of born globals, because the actual and perceived costs of pursuing an international strategy have decreased. However, the company has to be able to seize the opportunities presented by globalisation. Building on Oviatt and McDougall (1995), Andersson and Wictor (2003) argue that born globals are mostly founded by entrepreneurs with a strong international vision from inception. Industry characteristics and networks form the environment, in which a born global is founded. Although born globals often serve niche markets and can be found in many industries, industry characteristics of the company itself and its customers can have a significant impact on the internationalisation strategy.

The model presented above is comprehensible and gives a good overview on the factors influencing born globals, but the concept of born globals itself lacks in definition. Saarenketo (2002a) proposes a framework which clarifies the relationships between external influences, born global strategies and international performance. The framework is presented in Figure 5.

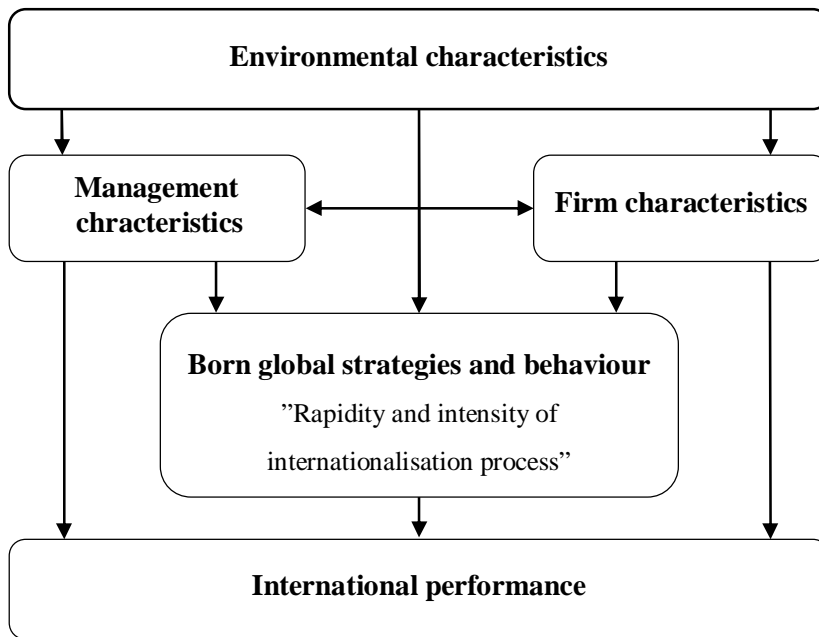


Figure 5: External factors, born global strategy and international performance.  
Source: Saarenketo (2002a)

The framework addresses important issues and relationships. Environmental characteristics, such as global markets or country-specific characteristics have an effect on international performance, but not as directly as the framework of Andersson and Wictor (2003) suggests. Saarenketo (2002a) argues that born global strategies and behaviour are influenced environmental characteristics directly and mediated by management and firm characteristics. International performance is influenced not only by born global strategies and behaviour, but also by management and firm characteristics. Management characteristics promoting born global strategies and behaviour and enhancing the international performance of the company include strategic motives, risk taking and a perceived need for internationalisation.

Most internationalisation theories are developed from earlier theories or are designed to challenge established theories; in both cases the newer theories are dependent on the former ones. An attempt to connect knowledge-based internationalisation theories with born globals is made by Brennan and Garvey (2009). The authors challenge the knowledge acquisition logic of the process models of internationalisation and argue that at the time of the founding of a new company there is already internationalisation knowledge accumulated in the individuals working for the company. The overall focus is on the individuals rather than the company as a unit.



According to Brennan and Garvey (2009), knowledge is the decisive factor separating born globals from traditional internationalisation theories. Whereas in the Uppsala model knowledge is a barrier to internationalisation, born global theory sees knowledge as an important driver for internationalisation. Knowledge-intensity is seen as a factor promoting early internationalisation. Casillas, Moreno, Acedo, Gallego and Ramos (2009) present a similar model of the role of knowledge in internationalisation. Prior knowledge facilitates internationalisation which leads to the search of new knowledge. Prior and new knowledge are integrated (absorptive capacity is needed) and determine behaviour (country and entry mode selection).

In the context of internationalisation, knowledge is related to international market opportunities, their recognition and exploitation. Since INVs by definition aim at rapid international market entry, opportunity recognition is important for their performance. According to Oviatt and McDougall (1994), INVs pursue a proactive strategy in pursuing market opportunities. However, as Kirzner (1997) points out, opportunities for profit cannot be objects of systematic search. Real opportunities arise and discoveries happen in situations of unawareness of missing information. Searching for missing information requires the recognition of the knowledge gap, which makes the search reactive behaviour. Although, as noted above, discovery of opportunities is often a product of chance, prior knowledge can be a decisive factor in the recognition of opportunities. Entrepreneurs often discover opportunities related to their prior knowledge and experience. (Shane 2000)

### **3.6 Knowledge-based view**

The knowledge-based view of internationalisation is a rather recently developed concept which up to date can hardly be seen as an established body of theory, but as a very interesting view on the internationalisation of knowledge-intensive companies. Its roots are on the one hand in the Uppsala model and its emphasis on experiential learning and on the other hand in the RBV and dynamic capabilities.

Dynamic capabilities are the link between RBV and the knowledge-based view of the firm and internationalisation (KBV), which has emerged as an extension of RBV. According to Kuivalainen (2003), the concepts of dynamic capabilities and KBV overlap to such an extent that they can be used interchangeably. The close connection of KBV and dynamic capabilities makes it obvious that the concept has to be further developed. However, the knowledge-based view of internationalisation contains many interesting ideas, which may be especially helpful for the understanding of the internationalisation of knowledge-intensive companies.

Because knowledge is a rather vaguely defined concept, it has been categorised in different ways. One of the most common ways is to distinguish between explicit and tacit knowledge. This distinction has been proposed by Polanyi (1966), who argued that explicit knowledge relates to knowledge which can be coded into systematic language and is thus easy to recognise and transfer, whereas tacit knowledge relates to knowledge which is based on personal experience and skills and the codification of which is more complicated.

The concept of tacit and explicit knowledge is widely used, but it is slightly problematic, because in actual real-life situations tacit and explicit knowledge are used simultaneously and the distinction between explicit and tacit knowledge is ambiguous. For this reason other categorisations are necessary. Hadley and Wilson (2003), based on Johanson and Vahlne (1977) distinguish between objective and experiential knowledge. The distinction is very similar to tacit vs. explicit knowledge, but focuses more on internationalisation to different markets. Experiential knowledge can only be obtained on the specific market, whereas objective knowledge can be generalised throughout different markets (Hadley and Wilson 2003, 699).

A more sophisticated definition is provided by Byosiere and Luethge (2008), who categorise knowledge into four domains: basic, emotional, experiential and innovation knowledge. The value of Byosiere's and Luethge's work is in the connection between these knowledge domains and knowledge conversion. Byosiere and Luethge use the categorisation developed by Nonaka (1994), according to which there are four types of knowledge conversion: socialisation (tacit to tacit), externalisation (tacit to explicit), combination (explicit to explicit) and internalisation (explicit to tacit). Byosiere and Luethge argue that experiential knowledge impacts all conversion processes which contain tacit knowledge. This is said to be due to the strong presence of tacit knowledge in experiential knowledge.

The relationship between tacit and experiential knowledge has been further investigated by Poikela (2004). Poikela sees experiential knowledge as a result of the synthesis of theoretical and practical knowledge. Experiential knowledge is then combined with tacit knowledge and results in knowing. The model is very straight forward and paints a very deterministic picture of knowledge.

Mejri and Umemoto (2010) provide yet another model of knowledge categorisation which is the point of departure in their theory of internationalisation. In this model, a distinction is made between market knowledge (explicit, objective knowledge) and experiential knowledge, which comprises entrepreneurial knowledge (exploiting opportunities) cultural knowledge (language, habits, laws and norms) and network knowledge (social and business network). A similar distinction is made by Eriksson, Johanson, Majkgård and Sharma (2000), who identify three types of international knowledge: internationalisation knowledge – the firm's capability to engage in international opera-

tions –, business knowledge – competitive situations in these markets – and institutional knowledge – information about institutions, rules and norms.

The model of Mejri and Umemoto lacks the consideration of the interactions of experiential and tacit knowledge, but it takes the different stages of internationalisation in account. The acquisition of experiential knowledge (network and entrepreneurial knowledge) starts in the pre-internationalisation phase. Drawing from the process models of internationalisation, Mejri and Umemoto (2010) argue that the more a company has experiential knowledge before internationalising, the more the knowledge is used in the later stages of internationalisation.

A concise proposition for a knowledge-based theory of the firm is presented by Grant (1997). Grant builds on Polanyi's knowledge categorisation and among others on the RBV. According to Grant's theory, knowledge is the most important resource of a firm and individuals are the primary agents of knowledge creation. The company's task is to integrate the different knowledge bases of the employees. Competitive advantage is created by fostering internal and preventing external knowledge replication.

The importance of knowledge creation as a determinant of companies is pointed out by Nonaka, Toyama and Nagata (2000). In their view, companies are primarily knowledge-creating entities, in which knowledge is created by the conversion spiral of socialisation, externalisation, combination and internalisation (see above). The company functions as the physical context of knowledge creation. According to Nonaka et al. (2000), knowledge without a physical context is merely information.

A knowledge-based view of internationalisation can be derived directly from the knowledge-based theory of the firm, because internationalisation can be seen as a form of innovation and because knowledge is necessary in coping with environmental uncertainties, which are common to internationalisation (Prashantham 2005). Prashantham synthesises a model based on a broad range of literature in the fields of internationalisation and management theories. Internationalisation is triggered by the social capital inherent in a company.

Social capital can be defined in many different ways, but Prashantham uses the following definition proposed by Adler and Kwon (2002, 23):

*“Social capital is the goodwill available to individuals or groups. Its source lies in the structure and content of the actor's social relations. Its effects flow from the information, influence and solidarity it makes available to the actor.”*

The social capital enhances market knowledge and knowledge-intensity, which in turn are beneficial for internationalisation. Prashantham also points out that the internet is a potentially very effective tool for information dissemination, acquisition and sharing. Beside social capital, knowledge-related resources and capabilities can be seen as

the source of competitive advantage and hence the basic motive for internationalisation (Kuivalainen, Puumalainen, Sinto and Kyläheiko 2010).

Saarenketo, Puumalainen, Kuivalainen and Kyläheiko (2004) develop an evolutionary knowledge management model for internationalisation, which is based on the development of new routines, technologies, products and management techniques from the knowledge-base of the firm or from external sources. In its fundamental logic – measurable knowledge determinants affect the decisions taken in a company and lead to competitive advantage– is similar to the logic of the RBV. The evolutionary knowledge management model is presented in Figure 6.

The model, although confusing at first sight, aims at explaining the creation of competitive advantage and incorporates external and internal processes, which contribute to the generation of new routines and capabilities, which in turn shape the internationalisation strategy. Through external search processes the company can integrate knowledge-bases of other companies, individuals or organisations. The driving force in the model of Saarenketo et al. (2004) is the nature of the firm-specific knowledge-base, which is characterised by the following knowledge determinants:

- Appropriability: The ease of protection from imitation, related to the concept of tacit knowledge.
- Threat of opportunism: Transfer of specific knowledge can create opportunistic behaviour in partners.
- Economies of scale: Cumulative learning and specialisation.
- Economies of scope: Applying existing capabilities to other activities.
- Path dependency: Behaviour is based on earlier experiences and cumulative knowledge.
- Asset specificity: Asset specific knowledge has no alternative uses.
- Strength of complementary providers: The dependency of a company on its partners.

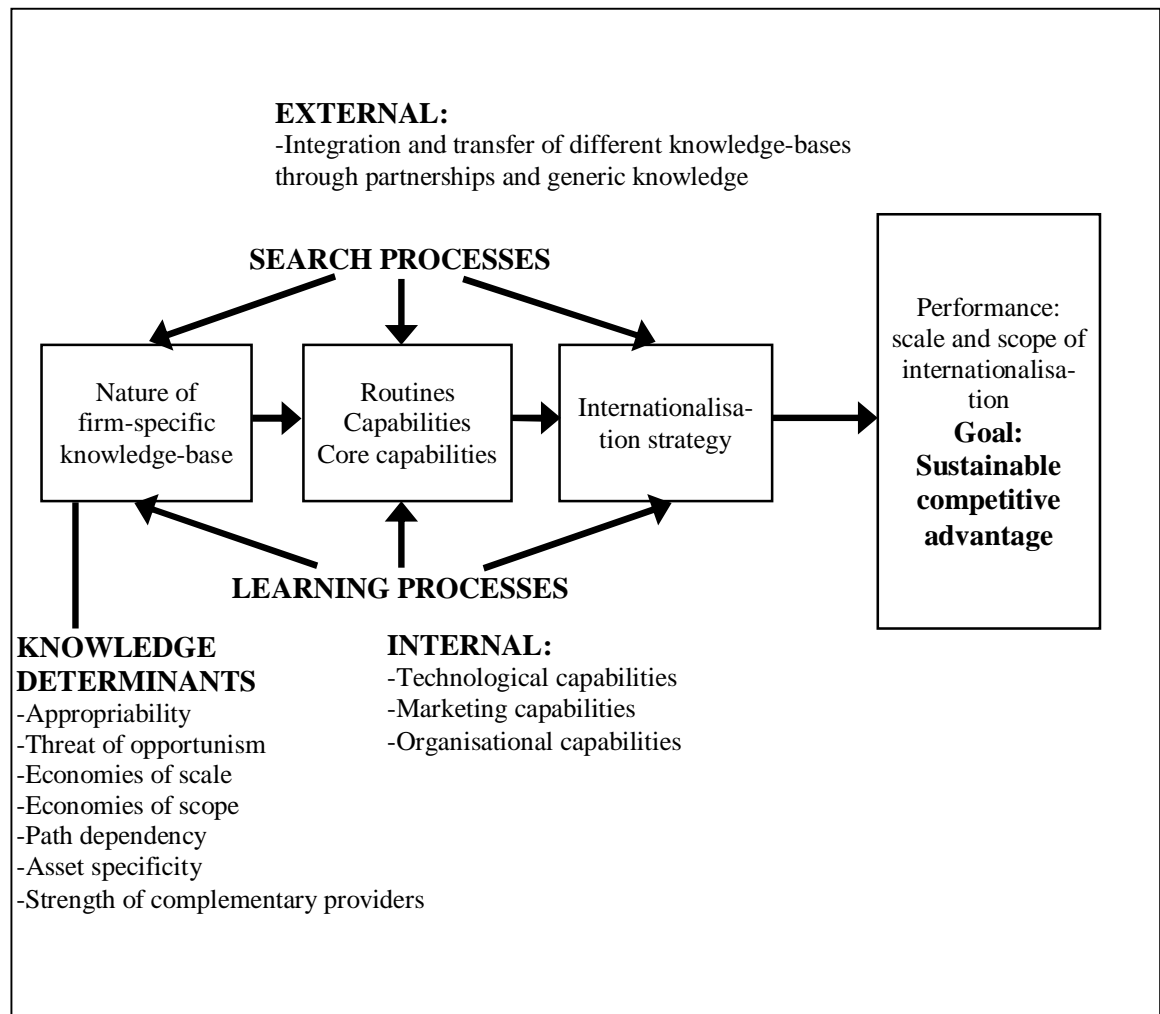


Figure 6: Evolutionary knowledge management model for internationalisation.  
Source: Saarenketo et al. (2004)

The major contribution of the evolutionary knowledge management model is in showing that the nature of the knowledge base of a company has a profound impact on all aspects of internationalisation and is the main source of sustainable competitive advantage. Changes in the knowledge base accordingly change the routines and capabilities, which can lead to a change in the internationalisation strategy and increase or decrease the competitive advantage.

The knowledge-based view of internationalisation is conceptually challenging, because it on the one hand utilises fundamental and ordinary concepts like knowledge and learning, but on the other hand it lacks in definition and conceptual coherence. The evolutionary knowledge management model presented above can be seen as an important step in the development of the knowledge-based theory of internationalisation, because it shows one possibility to operationalise the knowledge-base of the company.

However, as Brennan and Garvey (2009) point out, it is evident that knowledge-intensity is increasingly important as a driver for internationalisation. Hence the knowledge-based view is a fruitful tool for internationalisation research. The knowledge-based view can be used to trace back the knowledge-related roots of competitive advantage or to evaluate the effects of different factors to the internationalisation of the company.

### 3.7 Summary

The internationalisation theories presented above reflect changes in the business environment over time on the one hand and changes in the scientific field on the other hand. Theories and models should reflect actual conditions in the real world. In the case of internationalisation theories it is evident that for example the advances in communication technology and their impacts on international business have an effect on the research approaches and results of researchers.

It is obvious that the research conducted in the past 30 years has shown that the Uppsala model as a conclusive model of internationalisation is outdated and that other approaches are often more fruitful. However, the fundamental components of the model, for example experiential knowledge as a trigger of internationalisation, are surprisingly relevant in new contexts, such as the resource-based or knowledge-based view of internationalisation.

Knowledge is an important factor in most of the theories, but its role varies. In the Uppsala model it is a barrier, but as the experiential knowledge-base grows, internationalisation proceeds. Knowledge is seen as company-specific and it is assumed that at inception a company does not possess any experiential knowledge. This view is discharged in the later theories. In the network model network contacts are seen as a means to bridge knowledge gaps. The knowledge inherent in a firm's networks has an effect on entry modes and market selection.

The resource-based view, the born global/INV perspective and the knowledge-based theory define the role of knowledge differently. Whereas in older theories knowledge was seen mainly as a firm characteristic, the newer theories focus on individual level knowledge. In the RBV, the accumulated knowledge of a company's employees constitutes the firm's knowledge resources. The dynamic capabilities view builds also on the capability of the company to integrate external and internal knowledge resources. The knowledge-based view incorporates aspects of the Uppsala model, the RBV and the born global/INV theory.

New theories are often established to replace former theories, but they also incorporate elements of the old theories. Figure 7 illustrates an attempt to integrate concepts from the theories presented above into a comprehensive model.

The model incorporates relevant issues from each theory reviewed above. The most important underlying concept is learning and the use of knowledge-related and other resources. The source of internationalisation is in the resources and dynamic capabilities of a company. A crucial resource is the firm-specific knowledge-base, which influences the creation of routines and capabilities, as established in the knowledge management model (Saarenketo 2004). The resources and capabilities are subject to the learning cycle of the Uppsala model. However, the learning cycle should not be treated as a stable mechanism, but rather as one possibility to alter the resource-base of a company.

The firm-specific resources, routines and capabilities determine the internationalisation strategy of the company. Born-global strategies are depicted as an almost separate phenomenon, because the INV/ born-global approach is more than merely a strategy among other strategies. The actual internationalisation, the international performance of a firm, is determined by the internationalisation strategy and in many occasions by the international network of the firm.

The relationship between international performance and the international network of a company is very company-specific and mutual. A solid integration into international networks enhances the international performance and on the other hand, a good international performance facilitates the creation of new network contacts. As suggested by the Uppsala model and the KBV, experiential knowledge created in the course of internationalisation alters the knowledge resources of the company and has an effect on subsequent internationalisation events.

Despite the drawbacks of the Uppsala model, one of its key elements – the market commitment cycle – is included in Figure 7. The fundamental concept of knowledge, market commitment decisions and activities influencing each other is indisputably applicable to many situations and is also reflected in newer internationalisation theories. For example it can be argued that the efficiency of the market commitment cycle depends on the existence of dynamic capabilities, which were defined above among others as a potential to make timely and market-oriented decisions (Barreto 2010).

It should be borne in mind that the model proposed in Figure 7 is just one of possibly many ways to summarise and integrate concepts from the different internationalisation theories. The goal of the model is to show, how different internationalisation theories can be applied to the internationalisation of knowledge-intensive companies.

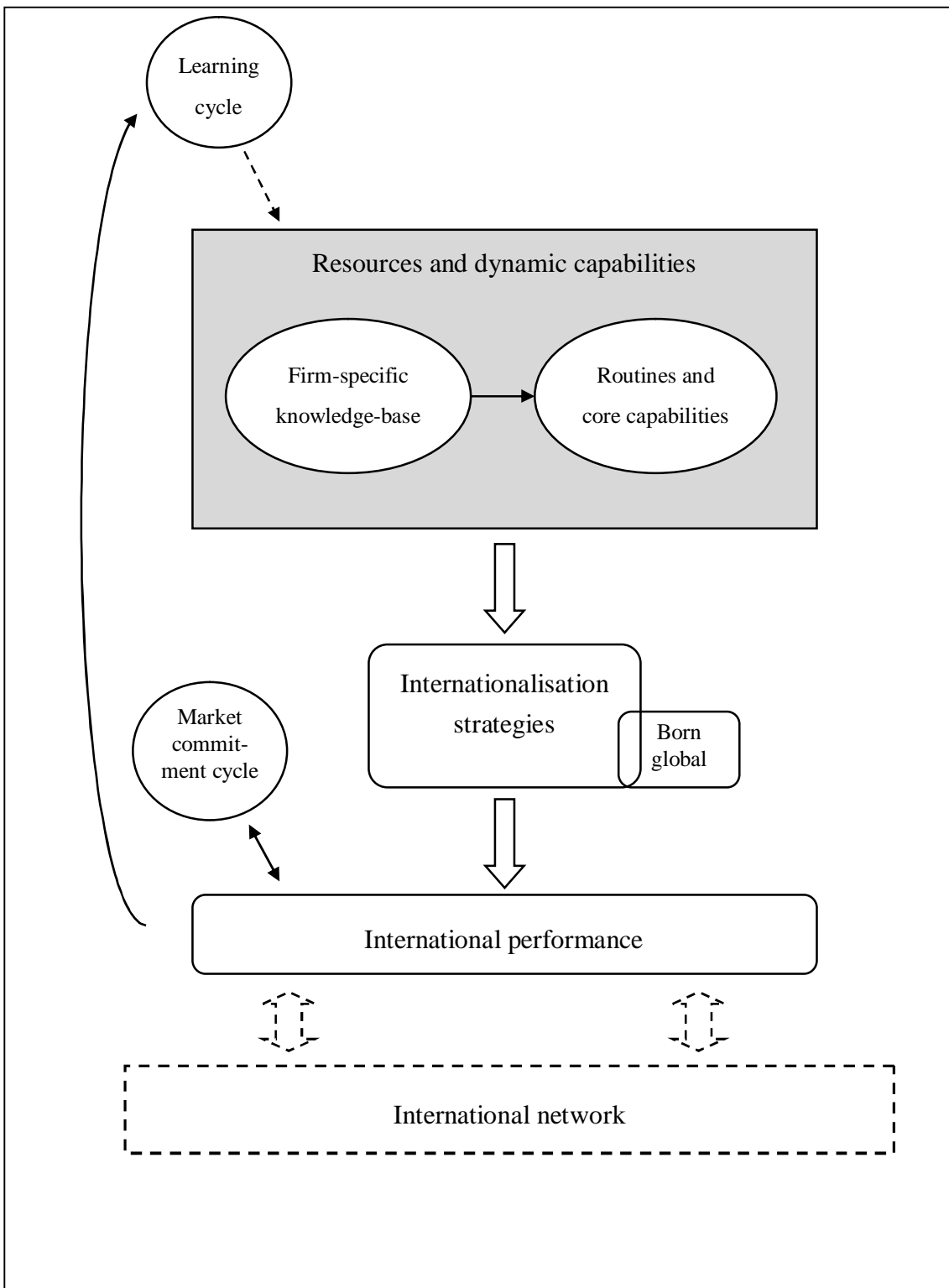


Figure 7: Interconnections of internationalisation theories



## 4 EMPIRICAL STUDIES ON THE INTERNATIONALISATION OF KNOWLEDGE-INTENSIVE COMPANIES

The theoretical foundations of knowledge-intensive companies were presented in chapter 3. In this chapter, empirical studies on the internationalisation of knowledge-intensive companies are analysed. The chapter begins with an overview of the literature included in the study, followed by the analysis of factors leading to internationalisation and of the speed, scope and intensity of internationalisation. Initially, an analysis of entry modes was planned, but the analysed literature did not include sufficient material on entry modes.

### 4.1 Description of the analysed studies

The empirical literature reviewed in this study is multifaceted in respect to methods, research subjects and theoretical backgrounds. This chapter provides a summary of relevant issues in the literature in a chronological order.

**1992–1997:** Jolly, Alahuhta and Jeannet (1992) studied the internationalisation of high technology start-ups in the 1980s. The authors used longitudinal case research with four case companies from the high technology manufacturing sector. The challenges in the internationalisation of the case companies in comparison with the internationalisation of established multinationals were found to be related to undeveloped networks and global presence. The case analysis showed that in order to internationalise successfully, high technology start-ups need a global managerial vision from inception, the ability to recognise turning points in the industry and a focused internationalisation strategy. Management philosophy or international orientation as a key factor in successful internationalisation was also identified by Tyebjee (1994). External factors such as home country environment or industry environment were also found to affect internationalisation.

The first case study on software companies included in this study was conducted by Coviello (1996), who studied the internationalisation of Datacom, a data collection software company. In concordance with former findings, a focused strategy with standardised products and niche markets was identified as a success factor. Networks facilitated internationalisation by providing market contacts and partnerships. Key markets were entered first and provided the company with internationalisation knowledge, which could be used in subsequent market entries.

As shown above, the role of management is a central issue in internationalisation. Reuber and Fischer (1997) studied the influence of the international experience of management teams on the internationalisation behavior of Canadian software SMEs. The

authors used quantitative analysis with a sample of 49 companies to examine the relationship between international experience, use of foreign strategic partnerships and the delay between start-up and first international sales. The international experience of the management team was found to be positively related to the use of foreign strategic partnerships and negatively related to the delay between start-up and internationalisation. The authors established that company size or age as such do not determine the capacity to internationalise.

**1998-2002:** An intensive longitudinal case study on the internationalisation of three biotechnology companies and a multimedia company was conducted by Zaby (1999). The author interviewed managers of the case companies in order to discover motives behind specific actions and the timing of these actions. The internationalisation of European biotechnology companies was motivated primarily by desired access to American organisations and their know-how. The liberal legislation in the USA has led to advances in both research and commercialisation of biotechnology, from which the companies strived to benefit. Another reason to enter the US market was the prediction that global standards in biotechnology would emerge from the USA. For the multimedia company, the main motives leading to internationalisation were access to scientific knowhow, educated workforce, financing and lead markets. The internationalisation sequence of all companies was characterised by both disruptive events (acquisitions and cooperations) and gradual development.

Coviello and Martin (1999) provide the only study on the internationalisation process and entry modes of engineering consulting companies in this sample. The researchers used a qualitative approach with four case companies from New Zealand. The trigger for initial internationalisation was found to come from knowledge resources or network contacts, especially from social and technical networks. Typically other international companies were interested in the expertise of the case companies, which lead to early internationalisation enabled by internationally experienced staff. Limited domestic markets were also identified as a stimulus for internationalisation. Subsequent internationalisation events were triggered by client followership and network contacts with other contractors.

Market selection was found to be mostly based on the location of clients and network members, the process can be described as reactive. Most of the markets entered by the case companies are geographically close, mainly in the Asia-Pacific region. Psychological distance in the market selection was overcome by hiring experienced staff. In most of the cases, the companies used direct exporting as entry mode. In general, the entry modes were not strategically planned, but rather project- and market-specific.

Jones (1999) studied the internationalisation of small high technology companies through the examination of the cross-border external links of the companies. The aim of the study was to examine the chronological development of internationalisation as an

inseparable part of the overall growth of the companies. The methodology of the study is insufficiently explained, both quantitative and qualitative methods were used to some extent. The data was collected through a questionnaire with a sample of 196 companies. The study resulted in five patterns of internationalisation:

- Domestic firms: companies with no cross-border links.
- Reluctant developers/export specialists: companies with few cross-border links, which often are trade-related. Often older companies.
- Conventional developers: companies with simple inward links followed by simple outward links.
- Rapid developers: companies with complex first events (multiple links), either inward or outward.
- International entrepreneurs: companies with multiple inward and outward links from perception.

Another study on the early internationalisation of high technology companies was conducted by Burgel and Murray (2000), who studied the international market entry choices of UK-based high technology start-up companies. The authors used a quantitative approach and a questionnaire for data collection. 362 out of 2000 randomly selected companies responded to the questionnaire, rendering a response rate of 19%.

The results showed that high technology start-ups internationalise rapidly; the time between inception and first international activities was 2,2 years in average. The companies preferred distributors to direct exporting as entry mode. Companies using intermediaries were found to be bigger and selling more standardised products than companies using direct exporting. The choice of entry mode was also found to be dependent on the domestic distribution mode; companies selling their products through distributors on the home market were found to prefer distributors also on foreign markets.

UK-based high technology SMEs were also studied by Crick and Jones (2000), but with a broader viewpoint on internationalisation. The researchers investigated the initial business strategy and international orientation of the companies, the rationale for initial market selection and entry mode choice and subsequent competitiveness in the internationalisation activities of the companies. Because the aim of the research was to identify motives or the rationale behind different choices, a qualitative approach was chosen. A case study on ten companies was conducted. The study rendered not insignificantly dissimilar results compared with the study of Burgel and Murray (2000). However, the differences are probably due to the focus on SMEs, whereas the Burgel and Murray studied companies of different sizes.

Crick and Jones (2000) found that the initial business strategy and international orientation were determined by entrepreneurial and managerial international experience as well as to some extent by location factors (science parks etc.). The speed of internationalisation varied and was determined by strategic issues rather than financial or environ-

mental constraints. Market entry was found to be a planned process, the case companies made decisions on market selection based on niche market opportunities rather than psychic distance. Entry modes varied, the companies started often with direct exports. The subsequent competitiveness was found to be dependent on strategic planning. Planned internationalisation usually resulted in success.

Determinants of the international growth of entrepreneurially led high technology firms were examined by Autio, Sapienza and Almeida (2000). The researchers tested the effects of age at entry, knowledge-intensity and imitability of technology to the international growth of companies from the Finnish electronics industry. A quantitative approach was used. The data was gathered with telephone surveys from a sample of 77 companies.

The age of a company was found to be negatively related to the subsequent international growth. Knowledge-intensity was found to be positively related to international growth. Against expectations, the imitability of the technology of the companies was found to be positively related to international growth. This dependence is probably due to the desire of the companies to benefit from the technology on many markets, before the advantage is eroded.

In the early 2000s, research on the internationalisation of knowledge-intensive companies took a leap forward. Especially in Finland and Sweden, a significant number of literature explicitly addressing knowledge-intensive companies was published. The dissertations of Saarenketo (2002) and Kuivalainen (2003) can be seen as seminal studies in this field, leading to research on various aspects of internationalisation.

Kuivalainen, Kyläheiko, Puumalainen and Saarenketo (2002) used a knowledge-based framework to study the internationalisation of Finnish telecom software suppliers. The aim of the study was to test the effects of knowledge determinants on internationalisation. Quantitative analysis was used to test the effects and the data was collected using a questionnaire. The sample consisted of 171 Finnish telecom software suppliers.

The results showed that the operationalisation of a knowledge-based model of internationalisation is demanding and its explanatory power in quantitative analysis is weak. However, some significant results could be obtained. Specificity of key assets was found to favour foreign direct investments as entry mode. The strength of complementary providers was found to be related to increasing internationalisation. This is mostly due to the international nature of the value networks of ICT companies. If a company relies on international partners, it faces pressure to internationalise. The number of patents was found to be positively related to the use of cooperative entry modes. When the company is able to protect its knowledge easily, external resources can be used more effectively.

Saarenketo (2002b) studied the internationalisation of born global companies in the Finnish ICT industry, using quantitative research with a sample of 18 companies with

an aim to identify factors leading to rapid internationalisation. The results showed that rapid internationalisation is promoted by global vision and risk taking of managers, as well as by external financing and partnerships. Contrary to predictions, the speed of internationalisation was found to be negatively related to the number of partners. This leads to the conclusion that the selection of partners in internationalisation is very important.

In the 2000s, research on biotechnology companies was conducted primarily in Germany and Scandinavia. Gurau (2002) studied the internationalisation processes and entry modes of biopharmaceutical SMEs in the UK. The study was conducted using qualitative analysis; the data was collected through a questionnaire, which was returned by 144 managers. The results revealed that, against expectations, insufficient domestic market opportunities were not seen as a reason to internationalise. Access to foreign resources was quoted as the main reason to internationalise. The results, however, can be questioned, since the methodology is insufficiently explained and the questionnaire is not included.

**2003-2007:** Andersson and Wictor (2003) studied the born global phenomenon in Sweden. The authors used a qualitative approach to study the internationalisation of Swedish new companies. Four case companies from the ICT, medical and manufacturing industries were chosen. The results showed that born globals were rare in Sweden. However, factors leading to born global strategies were identified. The accelerating globalisation of markets and the advances in communication technologies were identified not as a reason, but as a facilitating factor for born global strategies. International interest and motivation, as well as personal networks of entrepreneurs were identified as the main reason behind born global strategies. Niche markets were also identified as a factor leading to born global strategies.

Gabrielsson and Gabrielsson (2003) studied the marketing strategies of globalising ICT companies from small and open economies. The researchers divided the companies into globalising internationals (founded before 1985) and born globals (founded after 1985). Born globals face the challenge of scarce resources, whereas globalising internationals have to divest and decide, which processes to internationalise. Born globals were found to skip the early phases of internationalisation and enter into the global alignment phase immediately. Born global companies had a global focus and were characterised by horizontal integration through cooperation. Globalising internationals integrated horizontally or vertically and focused on core competencies.

Studies on Internet-based companies focus on North-America, which is reasonable given the hegemony of the USA in the development of computers, software and the Internet. Kim (2003) studied the internationalisation of US-based Internet portals. The research objective was to determine, whether the internationalisation of AOL, Lycos,

Yahoo and AltaVista fits the process model of internationalisation. The study was conducted using case study methodology based on secondary data.

The case companies internationalised gradually. Joint ventures were formed before setting up localised web sites. Regionally important countries were entered first, which was followed by a simultaneous entry into multiple markets. Socio-cultural distance was found to explain internationalisation to some extent, confirming the stage model partially.

A case study providing deeper analysis on the subject was conducted by Mahnke and Venzin (2003), who studied the internationalisation of ebay, a typical digital information good provider. The objective of the study was to determine, how the product characteristics of digital information goods influence the internationalisation of companies involved in their provision. Exploratory case analysis using secondary data was chosen as research method.

The internationalisation of ebay was facilitated by strong financing, which allowed for example for acquisitions as entry mode. Markets were often entered by acquisition of first-movers, thus getting access to valuable market knowledge and achieving market leadership. In the new markets, national web sites using national currency were established. The chosen entry modes allowed for control of customer learning, economies of scale were achieved through rapid market penetration. Rapid internationalisation was mostly enabled by two factors: The increasing importance of technical knowledge versus tacit market knowledge and the product characteristics of digital goods, which allow for post-internationalisation adjustments.

As the literature reviewed has shown, most of the research concentrates on developed, western countries. However, some studies on the internationalisation of knowledge-intensive companies from emerging markets have been published. De Mattos and Cross (2003) studied the alliance formation of biotechnology companies from Germany and the UK with companies from Brazil. The study was conducted using quantitative methods. The most important success factor for the alliances was found to be matching expectations. In order to succeed, an alliance has to be planned thoroughly and communication between the companies has to be frequent. Other factors facilitating alliances with Brazilian companies were expansionist strategies, small company size and specialisation.

Moen, Gavlen and Endresen (2004) studied the entry modes and market selection of small Norwegian software companies. The researchers conducted a case study on five case companies using in-depth interview to collect the data. Networks determined the entry mode choice of the case companies and to some extent the market selection. Virtual offices (localised web sites with local telephone numbers etc.) emerged as a new entry form. The researchers argued that intangible products require a rethinking of traditional entry modes. The market selection of the case companies was not determined by

psychic distance, but rather on a division of markets into three groups: Scandinavia, English-speaking countries and other markets. The case companies used the Internet intensively to develop international networks.

Loane, McNaughton and Bell (2004) studied the internationalisation of internet-enabled entrepreneurial firms from Ireland and North America. Qualitative methods were used; a case analysis was conducted using secondary sources complemented with in-depth interviews. The case companies had a global focus from inception. Market selection was often based on lead markets or client followership. Direct exports or online sales were the most commonly used entry modes. Formal and informal networks were identified as important factors facilitating internationalisation.

In 2004, two studies focusing on the differences between traditional and knowledge-intensive companies were published. Gemser, Brand and Sorge (2004) conducted a case study on 12 Dutch SMEs from the mechanical engineering and software industries. The results showed that SMES prefer cooperative internationalisation strategies. Engineering and software companies did not differ significantly. The explanatory power of the study and the reliability of the results are questionable, because statistical analysis was used in a case study. It is not clear whether the researchers intended to describe or explain internationalisation.

Bell, Crick and Young (2004) provide more reliable results in their study on the internationalisation of UK-based knowledge-intensive and traditional companies. The researchers used a qualitative approach in order to explain the linkages between overall strategy and internationalisation. A case study was conducted on five case companies from the IT and electronics industries and five firms from manufacturing industries. The data was collected through in-depth interviews.

The internationalisation strategies of knowledge-intensive and traditional companies differed significantly from another. The knowledge-intensive companies internationalised proactively, acting according to the overall strategic objectives of the company, whereas traditional companies mostly reacted to adverse domestic market conditions. The pace of the internationalisation of knowledge-intensive companies was rapid and multiple markets were entered simultaneously. Internationalisation activities were planned and aimed at the formation of international networks.

Nummela, Saarenketo and Puumalainen (2004) examined the pressure on the boundaries of internationalising Finnish ICT SMEs. The research approach was quantitative and the data collection was carried out using a questionnaire to key informants in 386 companies. The questionnaire yielded 124 responses. The results showed that, against expectations, rapidly internationalising companies had fewer international partners, because the search for partners was seen as time-consuming, thus hindering rapid internationalisation. The core competencies of rapidly internationalising companies were found

to be narrowly defined. Because rapidly internationalising SMEs mostly focus on niche markets, the companies need to identify and articulate their core competencies carefully.

Knowledge-intensive companies from the UK are featured in many of the studies comparing companies from different countries. Johnson (2004) compared computer software and hardware and electronics companies from the UK and USA in his study on the factors influencing rapid internationalisation. The nature of the study was exploratory and mixed methods (literature review, interviews and surveys) were used. The results revealed many similarities, but also some differences between the companies from the UK and USA. In both countries, important factors facilitating early internationalisation included international vision of the founder, desire to be an international market leader, international contacts and identification of a specific international opportunity. In the case of UK-based companies, international experience of the founders, the desire to create an international mindset, personal knowledge of international customers and the international and competitive nature of the industry and customers of the firm had also an effect on the early internationalisation. US-based companies were influenced by the opportunity to supplement domestic sales.

Spence and Crick (2004) compared the internationalisation of Canadian and British high technology SMEs. The purpose of the study was to identify critical factors influencing the decision making at each major phase of the internationalisation process and to determine the perceptions of the importance of these factors. The researchers used qualitative analysis and interviewed 24 managers of high technology SMEs in Canada and the UK.

The companies were found to internationalise rapidly and to focus on niche markets. Internationalisation was often based on unplanned events. The Canadian companies were more cautious in their internationalisation process and many were very reluctant to operate outside North America. This is mainly due to the lack of knowledge of foreign languages and cultural issues. The size of the North American market compared to the British market allows for a more cautious internationalisation strategy.

The role of information technology in the internationalisation of small high technology companies was studied by Aspelund and Moen (2004), who used quantitative methods to examine, how the use of information technology affects different aspects of internationalisation of Norwegian high technology companies. The data was collected via a questionnaire with a sample of 310 companies.

Companies using information technology extensively were found to experience a more rapid internationalisation and a wider market spread than companies using information technology to a lesser extent. The use of information technology was also found to be positively correlated to a strong technological advantage and to international orientation. Additionally, finding of niche markets was shown to be facilitated by the use of information technology.



Luo, Zhao and Du (2005) studied the internationalisation speed of American e-commerce companies. The researchers used quantitative methods; the data was collected by an archive search on a sample of 93 companies. The analysis showed that e-commerce companies internationalised rapidly, the average time span between founding and first internationalisation events being 2,64 years. The internationalisation speed was positively correlated with the international experience of management and the innovative and marketing capabilities in the company. Target country characteristics were also found to affect the internationalisation speed. Positive correlations were found between the internationalisation speed and a foreign nation's technology supportiveness, legal protection of intellectual property rights and regulatory transparency.

Crick and Spence (2005) studied the internationalisation strategies of high-performing high technology SMEs from the UK. The study was conducted as a case study with 12 case companies, using interviews with executives to collect the data. The internationalisation of high performing companies was found to be strategically planned and executed. Main initial triggers for internationalisation were the availability and use of existing contacts, development and use of resources and serendipitous encounters. The subsequent internationalisation strategy was found to be determined by the development of new networks, the learning of management and by unforeseen environmental changes. Overall, the capability of management to identify and exploit beneficial serendipitous events was considered important.

Rothaermel, Kotha and Steensma (2006) studied the international market entry choices of Internet-based companies in the US with an emphasis on country risk, national culture and market size. The researchers used quantitative analysis based on secondary data. The sample consisted of 173 publicly traded internet companies in the USA, representing 95% of the population. The results revealed that the companies were more probable to enter markets with a national culture similar to the United States. Individualism, low uncertainty avoidance and masculinity were found to be beneficial for market entry. Individualism and masculinity are not only related to the culture of the USA, but also to the products and business models of internet-based companies, which emphasises their importance in the market selection. However, the size of the target market was found to be the most important single determinant of market entry and to mediate the other factors. The advantages of big markets surpass the disadvantages related with market entry into culturally distant markets.

Loane and Bell (2006) studied the rapid internationalisation of entrepreneurially led companies in Australia, Canada, Ireland and New Zealand with an internet presence. The researchers used mixed methods, 750 companies were screened through an online search, which resulted in a sample of 218 companies. A data sheet with company information was sent to the companies for comments and addition. 143 sheets were re-

turned. Using statistical methods, patterns were developed. 53 companies were selected according to these patterns and interviews were conducted in these companies.

A majority of the case companies were knowledge-intensive, operating in niche markets with leading products. Networks were found to be the most important factor leading to internationalisation. Both existing and new networks are of importance, but building of new networks was found to be more common than the use of existing ones, especially in dynamic market conditions. Weak ties and personal contacts of entrepreneurs and managers provide often the initial motivation for internationalisation.

An interesting study on networks was conducted by Zain and Ng (2006), who studied the impacts of network relationships on the internationalisation process of Malaysian software companies. The researchers conducted a case study with three case companies from the software industry and one control case from the manufacturing industry with the aim to find support for several propositions. In the propositions networks are seen as pre-existing, which in the light of a substantial body of research is doubtful at least. This has to be born in mind when examining the results.

Network relationships were found to influence all important decisions influencing internationalisation: entry modes, market selection, and pace of internationalisation. Network relationships grant access to additional relationships and established channels and are a source of initial credibility. Costs and risks of internationalisation can also be lowered through network relationships.

Almor, Hashai and Hirsch (2006) studied the internationalisation of knowledge-intensive and traditional companies from Israel. Quantitative methods were used on a sample of 75 companies. The data was collected by structured interviews. Firm-specific knowledge, manifested in investments in R&D, was found to be the major source of competitive advantage in the introductory and early growth phases of internationalisation, being replaced by marketing and production in the later phases. R&D was found to be a strategically important function of the company and to be internationalised last, after production and marketing. The erosion of proprietary knowledge over time makes knowledge-intensity the most important trigger for internationalisation.

Arenius, Sasi and Gabrielsson (2006) examined the role of the Internet in the internationalisation of a Finnish software company. Qualitative methods were used to determine how and under which conditions knowledge-intensive companies can use the Internet as a sales channel in order to increase the speed of internationalisation. A longitudinal case study was conducted on a Finnish software company, observing the company for five years.

The Internet as a sales channel was found to moderate two major constraints in the internationalisation of small companies: resource scarcity and liability of foreignness. International growth using the Internet does not require heavy investments, a local pres-

ence can be achieved for example through virtual offices. The liability of foreignness is decreased by the ease of information gathering and communication.

Kuivalainen, Lindqvist, Saarenketo and Äijö (2006) studied the international growth of Finnish software companies with the aim to establish a typology of starting points, pathways and outcomes of internationalisation. A case study with five case companies from the Finnish software industry was conducted. The study resulted in three starting points and pathways and four outcomes. The starting points are start-up, small firm and established firm. Each type has its own specific advantages and constraints. The three identified pathways are born-global, collaborative and organic. The four identified outcomes are global generalist, market specialist, market niche and global niche strategies.

Ojala and Tyrväinen (2006) studied the business models and market entry modes of Finnish software SMEs operating in Japan. The study was conducted as a case study with eight case companies using semi-structured interviews to collect the data. The choice of entry mode was found to be mainly determined by the product strategy of the company; tailored products require representatives, localised core products are distributed through sales subsidiaries and mass products favour cooperative entry modes.

An exploratory analysis of the internationalisation of Irish software companies is provided by Garvey and Brennan (2006). The researchers conducted an online survey to the whole population of 279 companies, resulting in a sample of 28 companies. The level of internationalisation was found to be high and young companies internationalised rapidly. Important motives for internationalisation were access to new markets, international customer requirements and international competition. However, the reliability and validity of the findings is questionable due to the poor response rate and an insufficient level of analysis.

A more reliable study on biotechnology companies, than the study of Gurau (2002) was conducted by Gassmann and Keupp (2007), who studied the competitive advantage of rapidly internationalising biotechnology SMEs from Switzerland, Germany and Austria. The researchers used case study methodology with four case companies from Switzerland and one from Germany and Austria. Interviews were conducted with key informants from the Swiss companies and data on the German and Austrian company was collected from secondary sources.

Specialised knowledge and a rent-generating position in international networks were identified as the most important sources of competitive advantage. Innovative uniqueness and homogeneity of products or services facilitates the obtaining of a specialised position in an international value chain, which in turn leads to early and rapid internationalisation. Early and rapid internationalisation was also found to be positively associated with the scope and extent of intellectual property rights protection and the embeddedness in global communities and social networks. Replacing ownership of tangible assets with the access to the usage of them was also identified as a factor favouring ear-

ly and rapid internationalisation. Accordingly, a strong presence at a certain location hinders internationalisation.

Brännback, Carsrud and Renko (2007) studied the existence of born global companies in the biotechnology context. The research objective was to determine, to what extent young Finnish biopharmaceutical companies are born global. The researchers used mixed methods, utilising survey data and interviews.

The internationalisation of Finnish biopharmaceutical companies was found to be mostly motivated by a scientific push and environmental changes. Most of the companies lacked international marketing orientation. The science base, markets and human resources of the companies were found to be mostly global, whereas venture capital is local. The lack of proactive, demand-generating internationalisation led the researchers to the conclusion that there are very few born global companies in the Finnish biopharmaceutical industry.

The born global phenomenon in the Swedish biotechnology industry was studied by Nordman and Melén (2007), who concentrated on the relationship between the knowledge of founders and managers of born globals and the discovery and exploitation of foreign market opportunities. The researchers conducted a case study on 8 Swedish biotechnology companies with the founders still working in them.

Based on the results, the companies were categorised into born industrials and born academics. The founders of born industrials possessed high levels of technical and internationalisation knowledge, thus enabling a broad range of entry forms and an active search for international market opportunities. Born academics were found to lack internationalisation knowledge and to rely on reactive discovery of market opportunities.

A quantitative analysis of the market selection of Finnish software companies was conducted by Ojala and Tyrväinen (2007). The purpose of the study was to determine the influence of cultural distance, geographic distance and market size on the market selection of Finnish software SMEs. The study was conducted using secondary data from the Finnish national software industry survey. A sample of 53 companies was analysed.

Forsgren and Hagström (2007) studied the applicability of the Uppsala model to the internationalisation of internet-enabled companies using a longitudinal case study of eight companies. The results showed that in terms of psychic distance and speed of internationalisation the Uppsala model is outdated. Internationalisation is a strategic decision and the role of the owners of companies is important.

Laanti, Gabrielsson and Gabrielsson (2007) studied the globalisation processes of business-to-business born global companies in the wireless technology industry with a purpose to identify resources and capabilities enabling the differences to the globalisation of conventional companies. A case study on four representative companies was conducted using interviews with managers to collect the data.

The born global companies were found to follow niche product strategies based on customer segmentation instead of market segmentation. Founders with international experience were described as the main resource and source of capabilities. Innovations in niches and products not tested on home markets were also identified as important resources.

**2008–2011:** Al-Laham and Souitaris (2008) examined the internationalisation of German biotechnology companies from a network perspective. To test the influences of inter-organisational factors on the propensity to internationalise in form of research alliances, which are common in the biotechnology industry, the researchers used quantitative analysis on the whole population of 853 German biotechnology companies formed after 1995. The companies were observed from 1995 to 2004 and event histories were constructed for each company.

The results showed that company- and cluster-level factors are equally important. The international research alliance density of the regional cluster and the centrality of the new venture within its domestic network were found to be positively related with the propensity of the company to internationalise through research alliances. A similar positive correlation was found between the cumulative number of prior local and national research alliances and the propensity to internationalise through research alliances.

Ojala and Tyrväinen (2008) studied the market entry decision choices of US software SMEs with a sample of 100 companies. The software market size of the target country was found to explain 64% of market entry decisions. Geographical and cultural distance had no significant explanatory power, which may be due to geographical isolation of the USA.

Saarenketo, Puumalainen, Kyläheiko and Kuivalainen (2008) studied the market concentration/diversification and entry mode choices of Finnish ICT SMEs. The researchers took a quantitative approach and sent an Internet-based questionnaire to a sample of 366 companies. From the 171 responding companies, 78 had international operations and were included in the sample.

Market concentration was found to be positively related to the specificity of strategic knowledge-related assets and to the tacitness of knowledge. The use of hierarchical entry modes was positively related to a high degree of uncertainty and complexity, low appropriability of the knowledge assets and high economies of scope. The use of hierarchical entry modes was found to be negatively related to the specificity of strategic knowledge-related assets and economies of scale.

Ha, Choi and Jung (2008) studied the internationalisation of Korean high technology INVs. The researchers used quantitative methods; a questionnaire was sent to a sample of 590 companies. 131 completed questionnaires were returned, resulting in a response rate of 22,2%. The results showed that the companies in the sample internationalised

rapidly, the average time span from inception to first international operations was 2,37 years. Motives for internationalisation were market expansion, needs for new knowledge and technology and network development. Market selection was based on the amount of business opportunities in the target country rather than on psychic distance or other measures of familiarity.

Styles and Genua (2008) studied the rapid internationalisation of high technology companies created through the commercialisation of academic research. The researchers conducted a qualitative case study on four case companies from the software and medical technology industries. The results suggested that the internationalisation of the case companies could be divided into three phases: entrepreneurial events, pre-internationalisation events and internationalisation events. The behaviour of the internationalising companies differs from non-internationalising companies and is affected by the nature of network ties. Building and maintaining networks by academics, rather than by managers, was found to be pivotal to the early events in internationalisation. This can be explained by the fundamental role of academic research in the case companies.

Terjesen, O’Gorman and Acs (2008) studied factors leading to an intermediated mode of internationalisation of Irish and Indian software new ventures. Intermediated entry modes are modes, in which the new venture cooperates with a MNE. Typically the MNE functions as a distributor. A case study was conducted with one case company from both countries. The results showed that resource constraints lead to intermediated modes of internationalisation.

The concept of market-orientation in the internationalisation of small software companies was elaborated by Ruokonen, Nummela, Puumalainen and Saarenketo (2008). The authors conceptualise market orientation as consisting of customer orientation, competitor orientation and value-network orientation. The study was conducted using case study methodology. Two case companies from the software industry were selected. Company A offers diversified, customised products, whereas company B offers standardised products. The data was collected using interviews with managers and a questionnaire.

The results showed that customer orientation varies significantly based on the products offered by the company. For companies with standardised products, collecting customer information from all markets is possible and useful. Companies with customised products face severe challenges in the collection of customer information. Competitor analysis is important for companies with standardised products, because the success of the company is based on one product. Value-network orientation was found to be crucial for the international success of both case companies.

Gabrielsson, Kirpalani, Dimitratos, Solberg and Zucchella (2008) studied the early internationalisation of Greek, Norwegian, Finnish and Italian SMEs from different industries, including knowledge-intensive companies, in order to clarify the concept of born

globals. A case study with eight companies was conducted using interviews, archival data, company documents and observation.

Based on the findings, the researchers identified three phases in the development of born globals. Phase one is characterised by the formation of a strategy and the searching for financing and channels for growth. The selection of a channel for rapid growth depends on the specific characteristics of their organisation and its founder, the product and innovation, and the networking approach. Establishing a deliberate system for organisational learning is crucial for the growth of sustainable born globals. Phase two is characterised by growth. Sustainable born globals accumulate resources, funds and learning through their own growth. In phase three born globals have to make decisions on their future. When a born global ties in with a global market player or network, it has to decide, whether to give up its independence and become a member in the network of a global player or to be merely an affiliated contractor. Alternatively, the born global can pursue a break-out strategy and become independent from global players. In any case, the authors suggest that the growth of the born global leads to its transformation into an MNE in phase three.

Sasi and Arenius (2008) studied the role of social network relationships in the rapid internationalisation of Finnish ICT companies. The researchers conducted a qualitative case study with ten case companies. Internationalisation is seen as consisting of two phases, early internationalisation and international growth. Only one of the ten case companies achieved the international growth phase, which is mainly due to the bursting of the it-bubble at the turn of the millennium. Four of the case companies were instant internationals. The internationalisation of products was found to be easier than the internationalisation of services. Most of the companies had two founders, often friends. Resources were acquired through the personal networks of the founders. International growth was found to be impeded by the lacking ability to exploit the networks of the founders.

Bishop (2008) studied the role of relationships in the internationalisation of Hungarian and Czech knowledge-intensive companies. Bishop conducted a case study with a focus on the post-transition environment and network relationships. The market conditions in post-transition markets of Middle Europe affected internationalisation in two ways. For many companies, internationalisation was necessary for the survival of the company due to underdeveloped and saturated home markets. Internationalisation to lead markets was also found to be a means for image and brand building. Internationalisation was impeded by lacking financing and conviction about quality, poor marketing skills and entrepreneurial infrastructure, and cultural differences. Network relationships were found to be crucial for internationalisation. Horizontal alliances were common. Collaboration with competitors was found to be a means to compensate for small markets. Companies collaborated with universities in order to gain access to knowledge.

Saarenketo, Puumalainen, Kuivalainen and Kyläheiko (2008) studied knowledge-related learning processes in the internationalisation of Finnish high technology SMEs. The study was conducted using quantitative methods. The data was collected through a survey, which resulted in a sample of 120 companies. The average time span from inception to first international operations was 3,74 years and the average share of international revenues 30%. International markets were related with a higher risk of opportunism. Internationalisation was found to be positively related to technological and marketing capabilities of the companies. The role of organisational skills was found to become more important, as the companies gain internationalisation experience.

Fryges (2009) compared the internationalisation of technology-oriented companies in Germany and the UK using quantitative analysis. A survey of 2000 randomly sampled companies resulted in a sample 600 companies. A second phone survey to 438 companies resulted in 217 usable responses. The long-term export behaviour of German and British companies showed no significant differences, investment in R&D was found to be critical to internationalisation in both countries. However, differences were found between companies in Germany. East German companies were found to be less eager to internationalise. The fact, that even 20 years after the fall of the iron curtain such differences can be found, leads to the conclusion that cultural, environmental and infrastructure issues may have a significant effect on internationalisation.

Mort and Weerawardena (2009) studied the networking capabilities of Australian born global companies using qualitative methods. A case study on three high technology and three low technology companies was conducted. The owners or founders of the companies were found to be the primary sources of networking capabilities. Proactiveness, innovativeness and risk taking facilitate building networks actively. Rapid internationalisation was found to be enabled by carrying out certain functions through network members. The development of knowledge-intensive products is facilitated through direct or indirect learning from network members.

Ojala (2009) studied the role of network relationships in the entry of knowledge-intensive SMEs into a psychically distant market. The author conducted a qualitative case study on Finnish software companies operating in Japan. Knowledge-intensive companies were found to utilise existing or to build new relationships in order to achieve market entry into psychically distant markets. Target country and entry mode decisions were based on strategic issues rather than network relationships. In order to achieve market entry, companies without existing formal or informal network relationships can take advantage of mediated relationships.

Chandra, Styles and Wilkinson (2009) studied the international entrepreneurial opportunity recognition of Australian knowledge-intensive SMEs. The study was conducted as a qualitative case study with four case companies. Deliberate search and discovery of international opportunities was found to be promoted by prior international experi-



ence and knowledge, especially technical knowledge. Discovery of opportunities, rather than deliberate search, was more common among companies with less prior knowledge. The quality of international weak ties was also found to promote the discovery of international entrepreneurial opportunities, as well as entrepreneurial orientation.

Cultural and geographical distance were found to be negatively related to market selection, but the view that the first country to be entered is geographically and culturally closer than subsequent countries was not supported. The size of the software market in the target country was found to be positively correlated with market selection. Overall, geographic distance and software markets size explained 70% of the country preference.

The studies presented above suggest that psychic distance has no significant effect on the internationalisation of knowledge-intensive companies. This issue was addressed by Ojala and Tyrväinen (2009). The researchers used quantitative and qualitative methods to examine, if knowledge-intensive SMEs are immune to psychic distance and to determine, whether psychic distance should be measured macro-level or individual-level. The quantitative data was retrieved from the Finnish national software industry survey. The qualitative data was gathered from four case companies from the Finnish software industry operating in Japan using in-depth interviews.

The quantitative data showed no significant impact of psychic distance on internationalisation. However, the qualitative data suggested that psychic distance plays a role in the decisions of managers in the internationalisation process. The negative effects of psychic distance can be moderated through recruitment of local personnel. The findings in the qualitative part of the study suggest that psychic distance should be measured at individual-level, i.e. as a perception of managers.

Ruokonen and Saarenketo (2009) studied the strategic orientations (entrepreneurial, learning and market orientation) of rapidly internationalising Finnish software SMEs. The study was conducted as a qualitative case study with ten case companies. The results showed that each of the three strategic orientations is important for successful internationalisation. Market-driven entrepreneurial orientation is required for initial internationalisation. Further success requires a strong market and learning orientation. Learning through trial and error enables adaptation to changing conditions.

Lopez (2009) examined the born global phenomenon in Costa Rica. The authors used quantitative methods, gathering information from 40 software companies with a questionnaire. The results revealed that born globals are very rare in Costa Rica: there were almost no exports in the first year of existence. The average time span from inception to first exports was four years. Most of the companies were born regionals rather than born globals. Born regionals are defined as companies, which internationalise rapidly, but enter only geographically close markets.

Filatotchev, Liu, Buck and Wright (2009) studied the export orientation and export performance of high technology SMEs in China using quantitative methods. A ques-

tionnaire was sent to a sample of 711 companies in a science park, resulting in a sample of 291 companies. Export orientation was found to be positively related to R&D intensity. Export orientation and export performance were positively related to the presence of global networks, the presence of returnee entrepreneurs and to the knowledge transfer from abroad by returnee entrepreneurs.

Niosi and Tschang (2009) studied the internationalisation strategies of Chinese and Indian software MNEs. The data for the quantitative analysis was collected through interviews and secondary sources. The results showed that software outsourcing companies with limited financial resources tend to grow via greenfield investments rather than acquisitions and to enter psychically close markets or markets, which are less contested by other multinationals. The companies invested in large affluent markets for market share and in developing countries for access to labour pools.

Lin, Cheng and Liu (2009) examined the role of organisational slack in the internationalisation of listed high technology companies in Taiwan. A sample of 306 companies was analysed quantitatively based on secondary data. The results showed that high-discretion slack (cash) is negatively related to internationalisation, whereas low-discretion slack (unused borrowing capacity) is positively related to internationalisation.

Chetty and Stangl (2010) studied the network relationships in the internationalisation of software SMEs in New Zealand. The research was conducted as a multiple case study with ten case companies. Five companies internationalised incrementally and five radically (less than three years from inception, at least 75% of sales from 20 or more countries). Network relationships were found to be long-lasting and demanding to establish. However, they are an important source of credibility for companies from small economies. Radical innovations led to the radical internationalisation and diverse networks of five case companies.

Tolstoy and Agndal (2010) studied the network combinations in the internationalisation of Swedish biotechnology new ventures. The researchers conducted a case study on six case companies in order to determine the role of network resource combination in internationalisation. Product ventures were found to require combinations of market and technological resources, resulting in complex resource combinations across networks. Reputational resources lead to a smaller perceived risk. Market ventures use mainly existing resources. Resource combinations containing market knowledge and the ability to extract value from resources of customers were found to be important. Overall, product ventures are more challenging and resource consuming, because they require a broader scope of resources and knowledge.

Kuivalainen, Puumalainen, Sintonen and Kyläheiko (2010) studied the organisational capabilities in the internationalisation of small Finnish ICT companies. The study was conducted using quantitative analysis. An internet-based questionnaire was sent to a sample of 386 companies, of which 120 replied and were included in the study.

The results showed that international experience had no significant effect on organisational capabilities, which might be due to the young age of the companies. However, international experience was found to have a positive effect on the degree of internationalisation and international performance, which gives support to the stage models of internationalisation. Capabilities were found to explain the degree of internationalisation, but not international performance. Surprisingly, marketing capabilities were found to be negatively related to the degree of internationalisation.

Dib, Rocha and Silva (2010) studied the internationalisation of Brazilian software companies from the born global perspective, using quantitative analysis. Born global companies were found to internationalise in average 2,5 years after inception, traditional companies 11 years after inception. Born global strategies were found to be related with high R&D expenses, customised products and technological knowledge of entrepreneurs.

Lindqvist, Kuivalainen and Saarenketo (2011) studied incidents leading to the internationalisation of Finnish born global software companies. The researchers conceptualised internationalisation as proceeding in three phases: start, growth and consolidation. The start phase is characterised by business knowledge of founders and managers, market niches and lack of domestic demand. These factors lead to rapid internationalisation. Among the case companies, no evidence for external market stimuli was found. The growth phase is achieved through increasing involvement in focal markets and hiring of professional managers. The consolidation phase was entered by the case companies through mergers in five to six years from inception.

Ibeh and Kasem (2011) studied the role of networks in the internationalisation of business-to-business software SMEs from Syria. The researchers conducted a qualitative case study on six case companies, using interviews to gather the data. Relational factors were found to be very important for internationalisation. This is mainly due to the complicated bureaucracy and the cultural emphasis on personal relationships in Syria and other Middle-Eastern countries. Internationalisation was found to be facilitated by supportive interventions of social and business contacts. The importance of social ties decreases in the course of internationalisation and business ties become more important.

## **4.2 Factors leading to internationalisation**

Theories of internationalisation suggest a variety of factors leading to and triggering internationalisation. The empirical literature, given the large proportion of case studies, paints a more detailed picture of the factors leading to the internationalisation of knowledge-intensive firms. The analysis of the empirical literature suggested a grouping of

factors into three categories: individual level, firm level, industry and network level, and environmental level factors. This categorisation is supported for example by Saarenketo (2002a, see Figure 5).

#### **4.2.1 Individual level factors**

Individual level factors are related to the firms' owners, managers and employees. In many studies, internationalisation is said to begin with international orientation, a necessary characteristic of the company's manager or staff.

According to Loane, McNaughton and Bell (2004), international or global orientation of management is an important prerequisite for international internet start-ups. The global nature of the firm requires global orientation from inception. Mahnke and Venzin (2003) found a similar importance of an international managerial mindset in the internationalisation of digital information goods providers. Jolly, Alahuhta and Jeannet (1992) argue that the internationalisation of INVs is facilitated by the founders' strong vision of a global strategy.

Accordingly, a missing international orientation or a negative attitude towards internationalisation is a significant barrier for internationalisation. Spence and Crick (2006) found that Canadian high technology SMEs were less international than similar companies in the UK. The smaller degree of internationalisation was caused by the reluctance of Canadian managers to operate outside North America.

Having established that an international orientation of management is crucial for internationalisation, the focus of interest shifts to the sources of this orientation. Human orientation is a concept which can be defined in many ways and applied in almost any scientific discipline. Therefore it is crucial for the understanding of internationalisation to examine the sources and effects of managerial international orientation.

Earlier experience in international business or other international experience is the most important source of international orientation or intention to internationalise. International experience of managers, but also other employees, promotes the ability to recognise and utilise international opportunities (Zain and Ng 2006). Chandra, Styles and Wilkinson (2009) found a similar function of international experience among Australian knowledge-based SMEs. International experience and prior knowledge of founders or managers has an influence on the recognition of first time international entrepreneurial opportunities. Opportunities can be seized through deliberate search or discovery. International experience was found to be positively related with deliberate searching for opportunities, because managers could resort to their knowledge about entrepreneurial opportunities gathered in companies they had worked in before.

Managers with earlier experience in international business possess knowledge about and competencies in dealing with the international business environment, the carrying out of international operations and the risks involved. Managers' knowledge of their companies' knowledge-bases is an important determinant of the internationalisation strategy (Saarenketo, Puumalainen, Kyläheiko and Kuivalainen 2008). Additionally, internationally experienced managers can often utilise business contacts established in the companies they have previously worked in (Crick and Jones 2000). In addition to business knowledge, technical knowledge is a factor facilitating the internationalisation of knowledge-intensive companies, especially in the case of entrepreneurially led companies (Dib, Rocha and Silva 2010).

Another source of international orientation emerges from the research on high technology SMEs in emerging markets done by Filatotchev, Liu, Buck and Wright (2009). The authors found that returnee entrepreneurs have a major effect on the internationalisation of their companies. Returnee entrepreneurs have worked in developed countries before returning to their developing home countries. Returnee entrepreneurs are an important source of knowledge on internationalisation and international markets, which is otherwise costly and difficult to acquire in developing countries. Filatotchev et al. (2009) found that returnee entrepreneurs not only fill knowledge gaps, but also enhance the company's export orientation by recognising export opportunities in developed countries.

International orientation achieved by the international experience of the company's staff can also lead to rapid internationalisation via cooperation with other companies. Coviello and Martin (1999) argue that in the internationalisation of service SMEs, internationally experienced staff enables the company to share its expertise with other companies on the international markets in early phases of internationalisation. Reuber and Fischer (1997) found a similar relationship in the internationalisation behavior of Canadian software firms. The international experience of the management teams was found to be positively related to the use foreign strategic partnerships, which in turn enhances internationalisation.

The individual level factors leading to internationalisation can be summarised as knowledge resources residing in the management and staff of knowledge-intensive companies. Because a majority of the companies studied are relatively small and young entrepreneurial companies, the founder as the most important knowledge resource stands out. The similarities of the individual level factors in companies across industry boundaries suggests that knowledge-intensity is one of the most important characteristics of the firms in question and that the geographical location or the firm's industry does not stand out as the main determinants of the firms' actions.

In the light of the findings, experiential knowledge has a crucial role as a trigger for internationalisation. At first sight, this seems to be in accordance with the stage theories

of internationalisation, but there is an important difference. Whereas in the stage theories experiential knowledge is a firm level phenomenon, the findings described above show that experiential knowledge is gained and used on the individual level.

#### 4.2.2 *Firm level factors*

Firm level factors leading to internationalisation are mostly related to the company's strategy, products and financing. The literature is surprisingly meagre on the firm level factors compared to the individual level factors. A logical explanation for this phenomenon is the high proportion of studies focusing on entrepreneurial issues.

The level of knowledge-intensity in a company can be seen as one of the most important triggers of internationalisation. Almor, Hashai and Hirsch (2006) establish a link between knowledge-intensity and the probability to internationalise. Knowledge-intensity, defined as the ratio of the product-specific costs of R&D and the corresponding costs of manufacturing, is an indicator of the amount of proprietary knowledge inherent in the company. Proprietary knowledge dissipates with time through depreciation, diffusion and obsolescence, but the process can be slowed down through internationalisation. In new markets the knowledge, which on the home market has already spread to competitors, can still create competitive advantage.

Related to knowledge-intensity is the acquisition of knowledge. According to Gabriellsson, Kirpalani, Dimitratos, Solberg and Zucchella (2008) a deliberate system for knowledge acquisition is a prerequisite for sustainable born globals. Systematic accumulation of knowledge ensures continuing growth in the knowledge base of the firm and facilitates the profitable use of the acquired knowledge. The accumulated knowledge or the knowledge resources of the firm are often a decisive trigger for internationalisation (Coviello and Martin 1999). In a company with international knowledge resources the decision to internationalise is less risky and unconventional than in a company without international knowledge resources.

Core competencies can be seen as a product of the firm's knowledge base. In their study on the internationalisation of Finnish ICT SMEs Nummela, Puumalainen and Saarinketo (2004) found that rapidly internationalising firms had narrowly defined core competencies. A narrowly defined core competence is related to concrete issues, for example a certain technology or software, whereas a broadly defined core competence could for example be developing of software products. Because small firms often internationalise through cooperation, a narrow core competency enables the firms to seek complementary resources and attract possible partners. For firms with broad core competencies, finding of suitable international partners is more difficult, because the management teams have difficulties in communicating the firms' capabilities.

Knowledge and competencies have an effect on product strategies and R&D. In accordance with the narrowly defined core competences, niche products and innovations are beneficial to internationalisation. Laanti, Gabrielsson and Gabrielsson (2007) argue that born globals in the wireless technology industry achieve competitive advantage through innovations in niches in order to avoid direct competition with big companies and to achieve first mover advantage. Gassmann and Keupp (2007) made similar observations in the biotechnology industry. Internationalisation is substantially promoted by innovatory uniqueness, which creates international competitive advantage.

In addition to niche markets, standardised products trigger the internationalisation of knowledge-intensive companies (Ruokonen, Nummela, Puumalainen and Saarenketo 2008). Standardised products can be introduced to many markets quickly, because there is no need for local adjustment or localised training in the use of the product. In knowledge-intensive industries, especially biotechnology, the R&D investments needed to derive competitive advantage from a product are very high. These costs can be covered by profits from standardised products, which benefit from very low marginal costs of production and distribution (Gassmann and Keupp 2007). Despite the high costs, investment in R&D is one of the most important factors leading to the internationalisation of knowledge-intensive firms. Not only is it by definition one of the main characteristics of knowledge-intensive companies, but investment in R&D also creates assets, which are difficult to imitate and create competitive advantage (Fryges 2009).

Investment in R&D creates specialised products and services, which can be protected by intellectual property rights. Formal protection (patents etc.) is always expensive, but it can lead to significant competitive advantage. Product uniqueness and intellectual property rights protection create barriers for imitation, which gives the firm a better position on the market. (Gassmann and Keupp 2007)

Investment in R&D is mostly linked with innovations. According to Chetty and Stangl, the nature of innovations is reflected in the pattern of internationalisation. Radical innovations lead to radical internationalisation. This relationship can be seen as an effect of networks needed in the development of radical innovations, which also facilitate internationalisation. Another factor is the erosion of proprietary knowledge related to radical innovations.

The effect of company size to the probability of companies to internationalise is disputed. Traditional internationalisation theories are mostly based on large firms and see firm size as beneficial for internationalisation, mainly on the grounds of financial and knowledge resources. In contemporary theories, the focus has shifted towards small and medium-sized companies and company size is not seen as a determinant of internationalisation.

In the empirical literature there are differing views. Tyebjee (1994) argues that large high tech companies are more eager to internationalise than small companies, because

they possess superior financial resources and networks. Reuber and Fischer (1997), on the other hand, argue that company size or age do not as such determine the capacity to internationalise. Because internationalisation behaviour, as established in the previous chapter, is strongly related to managerial characteristics, the explanatory power of simple company level variables is weak. This view is supported not only by the findings of Reuber and Fischer but also by the significant amount of research on small firm internationalisation, which indicates that small firms often have a high capacity to internationalise.

Whereas size or age of the company do not have a significant effect on internationalisation, financial issues have a significant effect on internationalisation. Financial resources enable fast international growth and market penetration. The internationalisation of ebay, a leading online auction company, shows that strong financing gives a company possibilities to enter multiple markets and pursue market leadership through acquisitions (Mahnke and Venzin 2003). The solid financing enabled ebay to avoid many risks in a developing industry by acquiring first-movers in new markets.

Indications for the importance of external capital, mostly venture capital, were found by Bell, Crick and Young (2004), Laanti, Gabrielsson and Gabrielsson (2007), Gabrielsson, Kirpalani, Dimitratos, Solberg and Zucchella (2008) and Lin, Cheng and Liu (2009). According to Bell, Crick and Young (2004) changes in management and ownership mostly initiate a change in strategy, which in knowledge-based industries often leads to internationalisation.

Gabrielsson et al. (2008) propose that domestic or international venture capital is a prerequisite for sustainable born globals in knowledge-based industries. Laanti, Gabrielsson and Gabrielsson found similar patterns in the internationalisation of business-to-business born global SMEs. Resource constraints are overcome with external financing in order to pursue a rapid internationalisation strategy.

Lin, Cheng and Liu (2009) develop a deeper understanding of the effects of financial issues on internationalisation. Before examining the findings, it has to be noted that the authors studied listed companies in the Taiwanese high technology industry. Owing to this focus the sample might be skewed towards big companies, which might weaken the comparability of the results with results from research on SMEs.

Lin, Cheng and Liu (2009) introduce the concept of organisational slack, which consists of high-discretion and low-discretion slack. High-discretion slack is defined as the readily available resources of the company (e.g. cash), low-discretion slack is the available, unused borrowing capacity of the firm (e.g. equity-to-debt ratio).

Contrary to the findings of many other studies, Lin Cheng and Liu (2009) found that the amount of high-discretion slack is negatively related with internationalisation. Availability of high-discretion resources leads to risk-avoiding behaviour and reluctance to make strategic changes. Idle resources can also lead managers to avoid international



activities, such as joint ventures or mergers and acquisitions, in the fear of loss of power, status or influence. However, the relationship of high-discretion slack and internationalisation proved to be curvilinear. When the amount of cash rises beyond a certain level, it functions as a buffer and enables risk-taking and innovativeness, which in turn leads to internationalisation.

Low-discretion slack was found to have a positive effect on internationalisation. Because low-discretion slack is borrowing potential, it encourages the firm to be innovative and take risks in internationalisation in order to be profitable, attract external financing and meet the requirements associated with the external capital.

In addition to financing, the use of information technology is an important factor influencing the propensity of knowledge-intensive companies to internationalise. Aspelund and Moen (2004) argue that extensive use information and communication technology shortens the time from inception to first exports. Active users of ICT experience fewer difficulties in finding international contacts than less active users. On the other hand, firms with an international vision were found to be more eager to use ICT to achieve their goals. Arenius, Sasi and Gabrielsson (2006) made similar observations. The internet as a sales channel allows small companies to grow without heavy investments and enables global sales without physical offices in the target countries.

The firm-level characteristics examined above can be labelled as push factors or assets within the firm. However, some firm-level pull factors can also be identified. Gurau (2002) argues that access to foreign resources is the main reason for biopharmaceutical SMEs in the UK to internationalise. Because the domestic resources (technology, funding, staff etc.) are limited, companies based on scientific knowledge and advanced technology enter international markets.

Another pull factor is identified by Bishop (2008). Knowledge-intensive companies in economies in transition often experience situations, where internationalisation is necessary for the survival of the firm. In order to be able to compete on with Western companies even on home markets, Hungarian and Czech knowledge-based companies internationalise in order to build an internationally recognised brand or image.

### **4.2.3 *Industry and network level factors***

Based on the sample used in this study, industry and network level factors seem to have a major influence on the internationalisation of knowledge-intensive companies. 15 of the 32 studies, which deal with factors leading to internationalisation, mention industry and network level factors. The nature of the networks involved in small firm internationalisation are diverse in nature and origin. Networks of all origins are examined in the same chapter for reasons of clarity, in full awareness of the fact that there are differ-

ences between personal networks and networks of companies. However, the implications of all networks for the internationalisation of companies are similar.

Traditional internationalisation literature suggests that among the reasons for internationalisation, access to new markets is very important and often necessary for the company's growth. The literature reviewed in this study does not support this view unanimously. Surprisingly, market factors are mentioned very scarcely. In their study on Malaysian software firms, Zain and Ng (2006) argue that internationalisation is not market-driven. Internationalisation of knowledge-intensive companies is mostly proactive, not a response to changing market conditions.

Only few studies support the view that the internationalisation of knowledge-intensive companies is triggered by market growth or the prospect of access to new markets. In their study on the internationalisation of Irish software companies, Garvey and Brennan (2006) argued that many companies were pushed to international markets by insufficient domestic markets. However, the authors used a quantitative approach and an insufficient level of analysis to study motives, a subject which usually is studied by qualitative research.

Ibeh and Kasem (2011) support the view that adverse market conditions on the home market lead to internationalisation. Similarly to Garvey and Brennan, the authors studied companies in a small market, Syria. In addition to small size, Syria is characterised by a rather undeveloped ICT market. Ha, Choi and Jung (2008) found that the internationalisation of Korean new ventures is motivated by narrow home markets and opportunities to exploit new markets. Bishop (2008) argues that companies from formerly socialist countries internationalise in order to escape insufficient home markets. Based on these findings can be presumed that the effect of home market conditions on internationalisation is stronger on small and undeveloped markets.

Client followership is a common industry level factor leading to internationalisation. Loane and Bell (2006) argue that following an important client abroad is a good way to start international operations, because the familiar client reduces the liability of foreignness and gives the company credibility on the new market. Garvey and Brennan (2006) found that client followership is an important reason for Irish software firms to internationalise. Loane, McNaughton and Bell (2004) found a similar importance of client followership in the internationalisation of Irish internet-enabled entrepreneurial firms.

Whether the fact, that the three studies featuring client followership were conducted entirely or partially in Ireland, is a coincidence or is the result of an unknown underlying factor, remains unexplained. It is, however, doubtful that a phenomenon like client followership would play a role in only one country. Therefore it is reasonable to assume that Ireland is a representative case of a small, open economy and that similar patterns can be found in other small open economies.

The industry environment in general can also be a trigger for internationalisation (Tyejee 1994). If most firms in an industry are international, there is pressure on the remaining firms also to internationalise.

Network contacts are mentioned by many authors as a decisive factor leading to internationalisation. As noted above, networks are diverse in nature and origin and have different implications. Networks can be categorised for example as business or social networks, extant or new networks and firm or employee networks.

Networks function as a source of knowledge on international markets and internationalisation in general. Loane and Bell (2006) see networks as a source of social capital, which enhances the resource and knowledge base of the firm. Small, knowledge-intensive firms face many resource constraints, but are imbedded in numerous formal and informal network relationships. Business or social network contacts, in many cases so-called weak ties – informal, often personal relationships – grant access to decision makers on international markets, knowledge and funding and thereby help to overcome the resource constraints. Companies in emerging markets often face heavier constraints in terms of knowledge, funding and infrastructure. Global network contacts provided by returnee entrepreneurs promote the export orientation of knowledge-intensive companies and enable their internationalisation. (Filatotchev, Liu, Buck and Wright 2009)

Loane, McNaughton and Bell (2004) argue that the initial internationalisation of internet-enabled entrepreneurial firms is facilitated substantially by the founding team's networks established in previous engagements in similar industries. The importance of the networks for internationalisation was found to be positively related with the service-intensity of the firm. Through these networks, the internationalising firms can benefit from knowledge and expertise developed in other companies. For small companies, this form of free knowledge transfer is very important.

Coviello and Martin (1999) confirm the relationship between service-intensity and importance of networks. In their study on knowledge-intensive service companies the authors found that the initial trigger for internationalisation comes often from network partners in social or technical networks. The network relationships and the stimuli for internationalisation are often personal and informal, which facilitates early internationalisation. Zain and Ng (2006) argue that in the internationalisation of software firms, network contacts not only facilitate the internationalisation process, but are the source of the intention to internationalise.

According to Crick and Spence (2005) existing networks are important stimuli for the initial internationalisation of high-performing high tech companies. If the networks of the company or its staff are inadequate, firms often hire employees with network contacts promoting the internationalisation of the company. The positive effect of network contacts is amplified by the diversity of networks within a management team opposed to companies led by a single manager.

Like Loane et al. (2004) and Crick and Spence (2005), Sasi and Arenius (2008) put an emphasis on the existing networks at the time of first international activities. According to the authors, a common management team of INVs in the ICT sector consists of two or more friends. Thus the relationships within the company are based on trust and commitment. Internationalisation is achieved through established long-term relationships, which grant access to foreign resources. INVs can for example cooperate with larger firms in the distribution of their products in order to achieve a global market presence with limited resources. Another type of network cooperation is outsourcing R&D to universities.

Sasi and Arenius (2008) point out that the networks involved in the early internationalisation of INVs are social networks, i.e. informal networks of the founders, and not networks of the company. Because INVs are by definition international from inception and firm networks cannot be established before the founding of the firm, the internationalisation relies on the social networks of the founders.

According to Sasi and Arenius (2008) INVs focus on exploiting the existing network ties rather than building new ones in the early phases of internationalisation. Although this seems reasonable and saves money and other resources, internationalisation can be seriously impeded by disability to extract and mobilise resources from the existing network ties. In fact, out of the 10 case companies in the study of Sasi and Arenius (2008) only one achieved international growth after the phase of early internationalisation. According to the authors an important reason for this was the crisis of the ICT industry at the turn of the millennium, but the inability to build a global resource base from the existing network ties amplified the effects of the crisis.

Network theories and models and many empirical studies tend to portray networks as pre-existing, a viewpoint which in the light of the findings of Sasi and Arenius (2008) seems incapable of explaining the internationalisation of successful knowledge-intensive companies. In addition to existing networks, the role of new networks has to be examined.

According to Loane and Bell (2006), the existing networks of rapidly internationalising entrepreneurial firms are redundant, because most of the firms operate in niche markets with no extant networks. New networks are established in every target country in order to build a global network. Networks can be built by establishing relationships to important decision makers or by hiring them, thus buying into their networks. The role of new networks is further examined by Laanti, Gabrielsson and Gabrielsson (2007). According to the authors the role of existing networks in the internationalisation should not be underrated, but for the successful internationalisation of a company, its capability to develop new network is of greater importance. All case companies in the study of Laanti et al. (2007) were found to be actively networking with domestic and international network partners.

In addition to being a trigger or prerequisite for internationalisation, global networks can also be a goal for the internationalising company. Gassmann and Keupp (2007) found that among SMEs in the biotechnology industry the extent, to which a company is able to achieve a specialised position in an international value chain, is positively related to rapid internationalisation. By occupying a specialised position, the company can profit optimally from its profit-generating specialised knowledge.

The example of biotechnology firms given above illustrates the particular characteristics of companies employing academics and being dependent on scientific knowledge. Gassmann and Keupp (2007) argue that the important networks of highly specialised firms consist of researchers and universities, often covering the whole relevant scientific community. The argument is further developed by Styles and Genua (2008) in their study on high technology firms created through the commercialization of academic research. The networks leading to internationalisation were found to be established and maintained by academics rather than managers. By investing significant amount of time and resources into attending conferences and trade fairs the firms were able to build networks and build awareness of their products within the industry.

Companies with high degrees of scientific knowledge or output can also benefit from network contacts by internationalising through research alliances. In their explorative study on the German biotechnology industry, Al-Laham and Souitaris (2008) found significant correlations between firm and network characteristics on the one hand and the probability to internationalise through international research alliances on the other hand. Internationalisation was found to be positively related with the firm's regional cluster's research alliance intensity, prior local research alliances, the cumulative number of research alliances and the firm's centrality in its network.

The results indicate that the formation of international research alliances follows the same patterns as the formation of local research alliances and that physical distance or borders are of less importance than scientific expertise. A high number of prior local research alliances and a central role in its network not only enhance the firm's ability to internationalise and add to its knowledge resources, but the firm also becomes more attractive for international research institutes or other possible partners in the internationalisation through research alliances.

The studies examined above do not explicitly commit to the question, whether internationalisation is more affected by the quantity or quality of network ties. However, some observations can be made. All authors agree on the fact that the existence of networks promotes internationalisation, which leads to the conclusion that there is a fundamental relationship between the number of network contacts and internationalisation. The strength of this relationship and its applicability to growing numbers of network contacts is nevertheless disputable.

Gassmann and Keupp (2007), as stated above, argue that the networks of internationalising biotechnology firms are often extensive, covering the whole scientific community. However, the authors point out that the knowledge of the firms is so specialised that the actual number of network ties is not necessarily very high. The findings of Al-Laham and Souitaris (2008) about the biotechnology industry indicate that the quality of network ties is more important than the quantity. The centrality of a firm in its network, which can also be interpreted as a high quality of network ties, was found to be positively correlated to internationalisation.

The issue of quantity and quality of network ties is directly addressed by Chandra, Styles and Wilkinson (2009). In their study on Australian knowledge-based SMEs the authors tested the proposition that the number of international weak [network] ties is positively correlated to the recognition of first time international entrepreneurial opportunities. The results indicate that the number of ties does not have a significant effect on internationalisation, but the quality of ties has. As the authors state, “*What appeared to matter was not the number of ties but particular ones that linked the right people and firms at the right time.*” (Chandra, Styles and Wilkinson 2009, 47)

#### **4.2.4 Serendipitous encounters and concluding remarks**

In addition to the factors examined above, the literature suggests that although the internationalisation of most successful knowledge-intensive companies is planned and follows a strategy, the role of chance and serendipitous encounters should not be left unmentioned.

Chandra, Styles and Wilkinson (2009) argue that firms with little prior knowledge recognise international opportunities as the result of discovery rather than deliberate search. However, the prior knowledge influences the recognition of opportunities, so according to the authors pure chance or luck seldom leads to internationalisation. Crick and Spence (2005) argue that although internationalisation is mostly a strategic choice, the initial trigger can come from serendipitous encounters. The examples presented in the study share common features: the encounters are of social nature and are made by executives. A common situation is that the manager of a firm meets an old friend or starts a new friendship, which leads to business relations.

Unforeseen, disruptive events can be seen as a negative equivalent to serendipitous encounters, which lead to internationalisation. Economic crises or crises in certain industries are common disruptive events. For example Sasi and Arenius (2008) argue that the crisis in the IT industry determined the internationalisation of ICT companies.

In the theoretical literature, the concept of psychic distance is widely discussed. In the empirical literature, however, it is rarely mentioned. As can be seen in Chapter 4.1,

many studies suggest that psychic distance has little explanatory power in the internationalisation of knowledge-intensive companies. As Ojala and Tyrväinen (2009) point out, psychic distance as a quantitative, environmental measure is outdated. However, if a new approach is taken and psychic distance is examined as an individual-level factor, a perception of managers, the concept can be useful and should not be discarded.

This chapter has shown that there are many factors leading to the internationalisation of knowledge-intensive companies. Different authors emphasise different factors, based on the research approach and the theoretical background. However, there are certain common characteristics, which are present in almost every study. As expected, knowledge is the foundation of all individual, firm and industry and network level factors. International orientation is based on knowledge-generating international experience, Investment in R&D and intellectual rights protection are closely intertwined with knowledge. Network contacts are related to knowledge in the way that successful internationalisation requires the skills and knowledge to recognise beneficial network ties and to benefit from them.

### **4.3 Speed, scope and intensity of internationalisation**

This chapter discusses the speed, scope and intensity of internationalisation in the empirical literature reviewed. The speed of internationalisation is defined as the time span between the establishment of the company and the first international operations. However, in some cases the time between first domestic sales and first international operations is used as a definition, because the companies had no sales directly after their establishment. The scope of internationalisation is defined as the number and spread of markets served. The number of markets served is a simple measure and as such useful, but in some cases it is insufficient in the description of the degree of internationalisation. A company can serve many markets in geographical and psychical proximity without being truly international. Therefore the geographical distribution of the markets served is included in the definition. The intensity of internationalisation is defined as the share of revenues from international operations.

The speed, scope or intensity of internationalisation was addressed surprisingly scarcely in the literature reviewed. Only half of the articles provided useful and accurate information. Due to the different viewpoints, methods, research subjects and theoretical backgrounds used in the articles, direct comparisons or generalisations would not represent reality. Therefore the results of the individual studies have to be dealt as independent cases. However, similar results from similar can reveal common characteristics in certain groups or types of companies.

The sample shows clearly that knowledge-intensive companies internationalise rapidly. A majority of the companies mentioned internationalised within five years from establishment. The few companies, which internationalised more than five years after their establishment, were either comparatively old or had a low intensity of internationalisation. In general, many of the companies, which internationalised very rapidly, had also a wide scope and high intensity of internationalisation.

The most extensive and accurate information was provided by the literature on the internationalisation of Finnish software companies and other knowledge-intensive companies. In their quantitative study on Finnish high technology companies, Autio, Sapienza and Almeida (2000) found that the median age of the companies at first entry was four years. 20% of the companies internationalised in their first year of existence. The age at entry was found to be negatively related to international growth.

Saarenketo (2003) and Nummela, Saarenketo & Puumalainen (2004) conducted quantitative studies on ICT SMEs in Finland and obtained similar results. In the study of Saarenketo, the average time from establishment to internationalisation was 3,6 years, in the study of Nummela, Saarenketo and Puumalainen, the average time span was three years. Furthermore, the authors found that averagely 33,5% of turnover came from averagely eight foreign markets. Saarenketo, Puumalainen, Kuivalainen and Kyläheiko (2008) and Kuivalainen, Puumalainen, Sintonen and Kyläheiko (2010) conducted quantitative studies on the internationalisation of Finnish ICT SMEs and found that the companies internationalised averagely three to four years from inception. The average number of markets served was 8,7 and the intensity of internationalisation 27% (Saarenketo et al. 2008). The comparatively low numbers in markets served and intensity of internationalisation can be explained by the quantitative approach encompassing different kinds of companies, whereas in case studies the emphasis is on representative cases.

Ruokonen, Nummela, Puumalainen and Saarenketo (2008) highlight the relationship between the intensity and scope of internationalisation on the one hand and international success on the other hand in their case study with two case companies. Both companies internationalised in their first year of existence, but one of the companies had a share of international revenues of merely 20% and had to end its international operations. The other case company obtained most of its revenue from global markets and succeeded in growing internationally. The success was mainly due to a standardised product strategy allowing for quick access to global markets.

The results are corroborated by the findings of Ruokonen and Saarenketo (2009), who conducted a case study on ten Finnish software SMEs. Successful companies internationalised two to three years from inception and targeted global markets. The entry to global markets led to a high intensity of internationalisation, all companies obtained over 80% of revenues from abroad. Similar figures can be found in the case study of



Laanti, Gabrielsson and Gabrielsson (2007), who studied the internationalisation of Finnish business-to-business SMEs. The case companies were international from inception or internationalised in five years or less from inception. Major shares of the revenues – up to 97% – were obtained from international operations.

Sasi and Arenius (2008) studied ten case companies in the ICT industry and found that they internationalised rapidly. Four internationalised immediately after inception, three in less than two years and three in less than six years. However, the intensity of internationalisation remained low due to the crisis in the ICT industry at the turn of the millennium. A more successful case is presented by Arenius, Sasi and Gabrielsson (2006). The case company from the Finnish software industry operated globally from inception and obtains 70% of its revenues from markets outside of Europe. The company was established as a spin-off of a bigger company, enabling the rapid internationalisation.

The literature suggests that the rapid internationalisation of software companies is a global phenomenon. Zain and Ng studied three case companies from Malaysia. Two of the companies internationalised in less than two years from inception, whereas the third company internationalised seven years from inception. This difference is also reflected in the intensity of internationalisation. The share of offshore revenues of the two rapidly internationalising was 60% and 80%, whereas the third company obtained only 3% of its revenues from offshore operations. The differences are explained by the efficiency of network usage.

Ha, Choi and Jung (2008) studied the internationalisation of Korean INVs using quantitative methods. Given the research subject, it is not surprising that the companies in the sample internationalised rapidly. What is of interest, is the average speed of internationalisation: 2,37 years. In many quantitative studies the average speed of internationalisation is between two and three years. It seems that many knowledge-intensive companies have similar paths of company development, which leads to internationalisation at similar company ages.

Garvey and Brennan (2004) studied the internationalisation of Irish software companies and concluded that the speed of internationalisation is connected to the age of the company. The researchers conducted a quantitative study, which revealed that after eliminating two outstandingly old companies from the sample the average age at first foreign entry was 2,54 years. 29% of the companies internationalised in less than two years. These companies were also young, the average age being 3,5 years.

In comparison with results from case studies the intensity of internationalisation among Irish software companies is mediocre. 41% of the respondents had international revenues of over 50%. However, the sample contains companies with a low intensity of internationalisation, which would not have been included in a case study for reasons of representativeness.

According to Dib, Rocha and Silva (2010), rapid internationalisation is common among Brazilian software companies. The researchers conducted a quantitative study on the internationalisation of software companies. In the analysis, born-globals were defined as companies internationalising in five or less years from inception, whereas all other companies were defined as following a traditional path of internationalisation. The results showed that the average time from inception to internationalisation for traditional companies was 11 years, whereas born-globals internationalised 2,5 years from inception.

Since born-globals were treated separately, the results do not necessarily tell much about the software sector in Brazil, but instead they confirm the used definition of born-globals. Companies were more likely to internationalise at inception or three to four years from inception than six to eight years from inception. For nine to twelve years from inception, the likelihood to internationalise rose again. Based on this it can be argued that born-globals can and should be treated as a separate group of companies.

The scope of internationalisation among Brazilian software firms is low. Most companies internationalised to nearby countries with a low physical and psychological distance. A similar observation was made by Lopez (2009) in his study on the internationalisation of Costa Rican software companies. Hardly any export activities took place in the first year of existence and the average time span from inception to internationalisation was four years.

In addition to the slowly evolving internationalisation, the scope of internationalisation speaks against the existence of born global software companies in Costa Rica. Some companies in the sample used by Lopez had significant export activities in their first three years of existence and could hence be categorised as born-globals. However, a vast majority of these companies made their first exports to neighbouring countries. Hence Lopez (2009) uses the concept of born regionals to describe these companies. Born regionals can be seen as companies internationalising early on in their existence to countries in near proximity.

Ibeh and Kasem (2011) found in their study on Syrian software companies that there was a correlation between company age and speed of internationalisation. The six case companies internationalised between 0 and seven years from inception, the younger companies internationalising faster than the older companies. According to the researchers, the younger firms were international new ventures and benefitted from relational factors, mostly personal networks of the founders.

Internet-related companies can by definition be regarded as good examples of knowledge-intensive companies. The literature suggests that the speed, scope and intensity of internationalisation among internet-enabled companies are proportionally high, mostly due to the flexibility provided by the intangible products and services offered by the companies in question.

Loane, McNaughton and Bell (2004) studied the internationalisation of Irish internet start-ups using case analysis. Five of the eight case companies were international from inception and had export ratios ranging from 20% to 100%; the remaining three companies internationalised within two years from inception and had export ratios between 20 and 60%. All companies had a global focus at the start of their international operations. These results show that the use of communication technologies can promote the emergence of born global companies.

Similar findings are presented by Daekwan (2003), who studied the internationalisation of internet portals. Yahoo internationalised two years from inception and entered 22 markets in four years. AOL started internationalisation considerably late, 10 years from inception, but entered ten countries in five years. Lycos and AltaVista internationalised within one year from inception and entered 23 (Lycos) and 13 (AltaVista) countries in four years. The comparatively late internationalisation of AOL is explained by the fact, that the company was founded earlier than the other case companies. The actual internationalisation of all companies took place at roughly the same time and with a similar intensity.

The internet auction portal ebay internationalised similarly (Mahnke and Venzin 2003). Ebay internationalised three years from inception and entered 15 different markets. The rapid and geographically wide internationalisation was facilitated by easy and inexpensive collection of market and customer information.

Lu, Zhao and Du (2005) conducted a study on the internationalisation of American e-commerce companies using quantitative methods. The average speed of internationalisation was 2,6 years, which is in line with the findings of the case studies presented above. According to the authors the major factors enhancing the speed of internationalisation were international experience of the team of management and innovative capacity of the company as well as technology supportiveness, regulatory transparency and legal protection in the foreign nations.

The findings of the studies presented above are corroborated by Forsgen and Hagstöm (2007), who studied the internationalisation of eight internet-related companies. All case companies internationalised in less than five years from inception and had a global focus from the start.

The speed, scope and intensity of the internationalisation of knowledge-intensive companies from the U.S., UK and Canada have been studied by several authors. Crick and Spence (2005) studied the internationalisation of high-performing high-technology SMEs in the UK and found that nine of the twelve case companies internationalised in less than three years from inception. International opportunity recognition as a managerial skill was found to be an important factor influencing the speed of internationalisation. A similar pattern was found by Spence and Crick (2006) in their study on the internationalisation of Canadian and British high-technology SMES. 16 out of 24 case

companies internationalised within three years from inception. However, the Canadian companies were more cautious in their decisions mainly due to the seclusion of the market and language problems. The main trigger for rapid internationalisation was the strategic choice to serve niche markets.

Johnson (2004) compared the internationalisation patterns of high-technology start-ups from the UK and U.S. The speed of internationalisation among the 89 companies in the sample was exceptionally high. The average time span from inception to first international activities was 0,4 years for companies in the UK and 0,8 years for companies in the US. Compared to other studies the speed of internationalisation is very high. The sample included companies operating in computer hardware and software sectors, as well as electronics companies, which makes the speed even more remarkable.

The scope and intensity of internationalisation observed by Johnson (2004) were more alike to comparable literature. The UK-based companies internationalised to 14 countries in average, whereas the U.S.-based companies internationalised to 20 countries. The average intensity of the U.S.-based companies was 57%, whereas the same figure for the UK-base companies was 40%, a considerably low percentage considering the rapidity of internationalisation.

The findings of Bell, Crick and Young (2004) differ significantly from the findings of Johnson (2004). Bell, Crick and Young compared the internationalisation of knowledge-intensive and traditional companies in the UK. The 15 knowledge-intensive case companies were from similar industries as in the study of Johnson (2004): electronics and IT companies. However, the speed of internationalisation was found to be significantly lower. Only seven of the 15 case companies internationalised in less than five years. Companies with a high intensity of internationalisation (over 70%) internationalised in less than four years from inception. The difference to the findings of Johnson (2004) is likely to be due to Johnson's focus on stat-up companies.

Burgel and Murray (2000) conducted a quantitative study on the internationalisation of technology-based start-up companies in the UK. The methodology and focus are thus very similar to those of Johnson (2004). However, Burgel and Murray (2000) studied a broader range of high-technology industries. This may explain the slightly higher average speed of internationalisation, which in the sample of Burgel and Murray was 2,2 years from inception.

The internationalisation of Norwegian software companies was studied by Moen, Gavlen and Endresen (2004) with surprising results regarding the speed of internationalisation. Information on the speed of internationalisation was provided for only one of five case companies. The company in question, a data security software company, internationalised nine years from inception. This comparatively slow internationalisation may be due to the fact that the company was founded in 1984. Most of the companies

studied in the literature reviewed for this study have been founded in the 1990s or 2000s.

A rather extreme case in regard of speed and scope of internationalisation is presented by Andersson and Wictor (2003) in their case study of a Swedish medical equipment company. Within six months of their first sales, the company exported to 46 countries. In this case the speed of internationalisation is counted from first sales rather than from inception, because the time between the founding of the company and first actual business activities was longer than usual. Factors facilitating the immense speed and scope of internationalisation were among others very narrow niche markets and pre-existing contacts and networks.

Loane and Bell (2006) conducted a study with mixed methods on the internationalisation of entrepreneurial, mostly knowledge-intensive, companies in Australia, Canada, Ireland and New Zealand. Speed and intensity of internationalisation were found to be high. 70% of all companies internationalised in less than two years and had an intensity of internationalisation of over 50%. However, the average scope of internationalisation was low. 60% of all companies internationalised to less than five countries. An important observation is that the country of origin was not found to determine the pattern of internationalisation.

Software companies from New Zealand were also studied by Chetty and Stangl (2010). The study was conducted as a case study with five out of the ten case companies having internationalised within three years from inception. This finding, of course, has little explaining power, since the cases have not been selected randomly. However, the findings on scope and intensity illustrate well the characteristics of knowledge-intensive companies in small economies. These five companies operated in over 20 countries and had an intensity of internationalisation of over 75%. This shows that the companies operate in niche markets, which require a large number of markets.

This analysis corroborates the statements of the theoretical literature to the speed, scope and intensity of internationalisation in the case of knowledge-intensive companies. Rapid internationalisation and a significant market share from inception are very common strategies among knowledge-intensive companies. In the light of the analysed literature, a majority of internationalising knowledge-intensive companies can be labeled as born globals.

#### **4.4 Summary**

Similarly to the theoretical literature, the empirical literature paints a multi-faceted picture of the internationalisation of knowledge-intensive companies. Research has been

conducted throughout the world, with different methods and addressing different research problems.

Despite the diversity, the literature suggests that there are certain characteristics shared by a majority of the companies studied and that these characteristics are reflected in the internationalisation of the companies. A schematic illustration of these characteristics is presented in Figure 8.

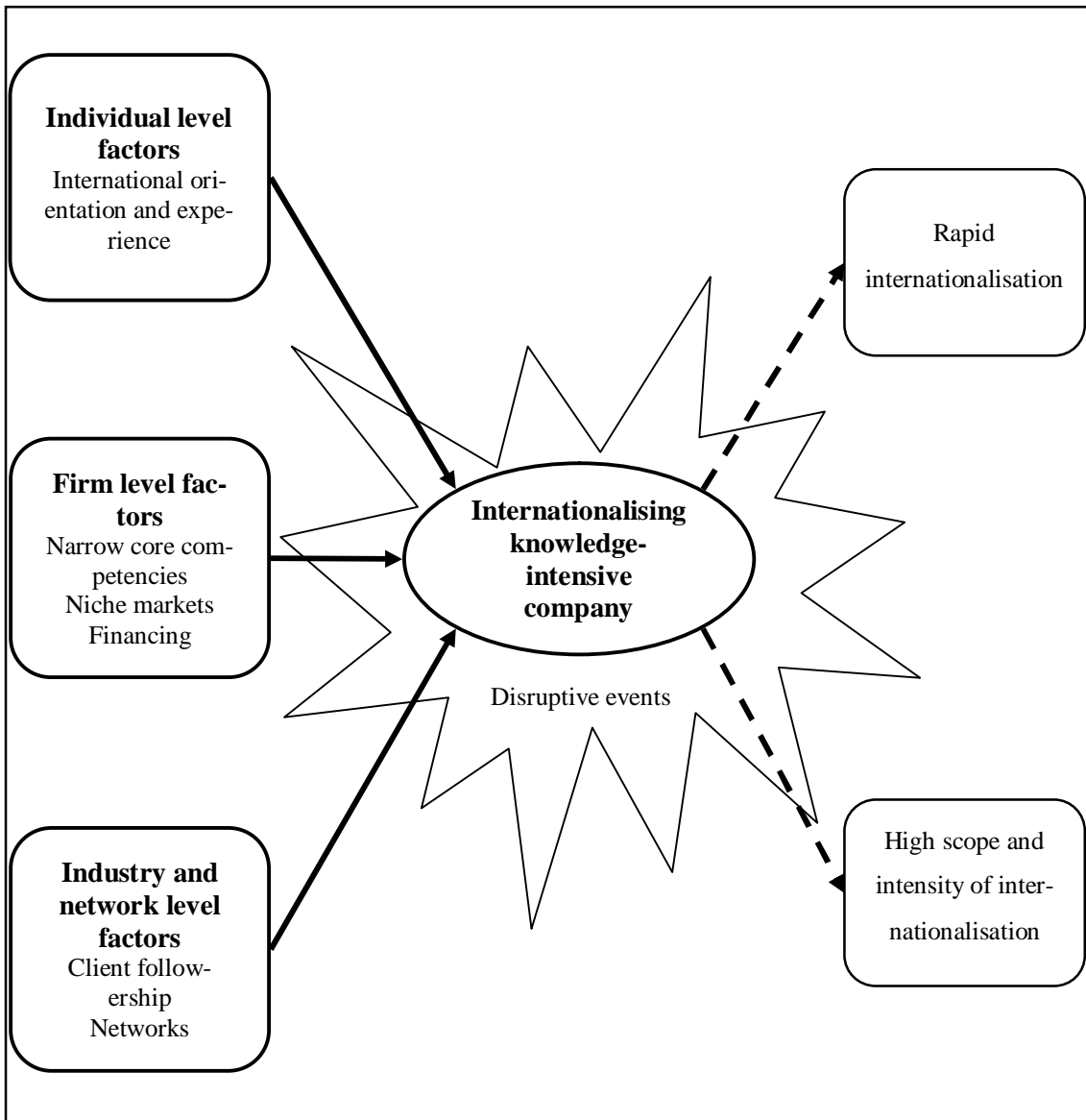


Figure 8: Internationalisation of knowledge-intensive companies in the empirical literature

The individual level, firm level and industry and network level factors, which were found to be influential to the internationalisation, not only have an impact on certain events in the internationalisation of the company, but can also be seen as the very constituents of the company. The three groups of factors determine the nature of the firm

and enable its internationalisation. Individual level factors can be seen as the motivation, which is crucial for the internationalisation of any company. The company level factors are necessary tools, which make it possible for the company to pursue its international goals.

However, as the literature suggests, serendipitous encounters and disruptive events can alter the effect of the factors mentioned above and thereby either promote or hinder the internationalisation. On the one hand, surprising opportunities like business contacts or cooperation possibilities can have a significant facilitating effect on the internationalisation of a company, on the other hand disruptive events, such as financial crises or other negative events can seriously hinder or even prevent internationalisation. In either case, the implications are very difficult to predict.

One important issue to be born in mind is, that the issues presented in Figure 8 do not form a straight-forward, causal process. Internationalisation is not a one-time event and experiences from internationalisation as well as changes in the company have an effect on factors like international experience or international networks. Thus the schematic internationalisation pattern has also a circular component.

## 5 CONCLUSIONS

The aim of this chapter is to conclude the findings from the theoretical and empirical literature and to establish an understanding of the theoretical and empirical literature. The theoretical discussion on the topic is followed by research implications.

### 5.1 Theoretical discussion

Since the nature of this study is rather descriptive than explanatory, this chapter aims not at determining, whether a certain theoretical framework is backed up by empirical findings. Instead, the main interest is in examining, which theories have been mostly used in the empirical literature, and if similar issues are addressed in the theoretical and the empirical literature.

Table 4 summarises the use of the internationalisation theories in the empirical literature as percentage of the total of 68 articles. Very few publications used a single theory; frameworks with elements from two or three theories were most commonly used. Therefore the sum of the percentages in Table 4 is more than 100. Contrary to the expectations based on the theoretical literature, stage models were used in surprisingly many studies.

However, in most cases only some elements of the theories were used in combination with other theories. In cases, where the applicability of the Uppsala model to knowledge-intensive companies was tested, the results showed that the theory as such is outdated. Despite the fact that issues, such as cultural and geographical distance were found to be crucial in the explanation of the internationalisation of some knowledge-intensive companies, the stage model was found to be too rigid and predetermined in order to explain the internationalisation of knowledge-intensive companies.

The network model or network theory was used in nearly one fifth of the analysed studies, a high number considering the modest theoretical elaboration of the model. Accordingly, the network model was mostly used in combination with other theories.

The virtually non-existent use of the resource-based view and dynamic capabilities theory in the empirical literature is staggering, since the theories were developed in order to better understand new phenomena in internationalisation, into which category knowledge-intensive companies certainly fall. A closer examination reveals that although the resource-based view is very scarcely used as a theoretical foundation, it is present in many studies. As established in Chapter 3.6, the knowledge-based view is strongly rooted in the resource-based view and in dynamic capabilities and is present as an underlying perception of the way, in which companies are seen. Additionally, in



many studies using INV or born-global theory, resources and capabilities are present in research questions and themes.

The INV/ born-global approach is clearly the most frequently used theoretical framework in the empirical literature. This popularity is mainly due to the fact that the emergence of the INV/born-global approach was at least partly due to the observation that small, technology- or knowledge-driven companies internationalised rapidly. Against this background it seems very appropriate that the approach is commonly used in studies on knowledge-intensive companies.

Contrary to prior expectations, the knowledge-based view was used in only five studies. Based on the findings, it seems that the knowledge-based view has not been seriously tested with empirical research. Additionally, the most influential theoretical literature has also been published almost a decade ago, which raises the question, whether the knowledge-based view will ever become a major theory used in international business research. The knowledge-based view of internationalisation is still developing and lacks in definition and a generally accepted model of internationalisation, which makes it less suitable as a theoretical framework in empirical research.

Theories, which are not included in Chapter 3, were used in less than one third of the empirical studies. These theories include among others product and company life cycle theories, strategic orientation theory and FDI theory. However, these theories were mostly used in combination with a theory included in this study.

Table 4: Theories used in the empirical literature

Theory	Stage models	Network model	RBV/dynamic capabilities	INV/born global	KBV	Other
Share of articles	24%	19%	3%	30%	7%	31%

A comparison of the theoretical and empirical literature reveals that both describe the internationalisation of knowledge-intensive companies similarly, although certain differences can be observed. As can be seen in Figures 7 and 8, resources and capabilities have a significant impact on the internationalisation. Although, as stated above, the resource-based view was scarcely used in the empirical literature, the results are clear. Most of the individual-level and firm-level factors identified in the literature can be categorised as resources and capabilities.

Differences between the theoretical and empirical literature exist especially in terms of the speed of internationalisation. In the theoretical literature, rapid internationalisation or born-global strategy is a strategy among others and as such it is not an essential part of the model in Figure 7. The empirical literature, however, suggests strongly that

rapid internationalisation is typical for the internationalisation of knowledge-intensive companies. Especially international success is linked to rapid internationalisation.

Another area of difference between the theoretical and the empirical literature is the focus of the literature. The theoretical literature focuses more on firm- and market-level issues, whereas the empirical literature emphasises individual-level factors more, as established in Chapter 4.2. This may be at least partly due to different approaches taken. The theoretical literature mostly aims at generalisations: Theories are designed to explain or predict the actions taken by companies. On the other hand, a significant share of the empirical studies consists on case studies with one or few case companies. The logical consequence is that in a case study on a small, often strongly entrepreneurial company, the role of individuals is emphasised. Whether or not either of the approaches paints a more accurate picture of reality is not in the scope of this study, but based on the literature both approaches are appropriate, when used with appropriate research questions.

The comparison of the theoretical and empirical literature shows that the theoretical literature omits an issue, which is mentioned in many empirical studies: serendipitous encounters and disruptive events. The empirical literature suggests that unforeseen events and contacts often play a crucial facilitating or hindering part in internationalisation. This phenomenon is also most likely due to the different approaches in the literature. Empirical case studies on small companies are more likely to reveal the effects of serendipitous encounters and disruptive events than theoretical literature focusing on larger entities.

Both the theoretical and the empirical literature agree on the importance of individual and company-specific characteristics as determinants of internationalisation. The international success of a company is fundamentally based on decisions made and knowledge gathered in the early phases of the company's life cycle.

## **5.2 Research implications**

Although this study provides a comprehensive view on the internationalisation of knowledge-intensive companies, many possible research questions remain unanswered. As established above, the knowledge-intensive view of internationalisation is underdeveloped and as such should be a subject of empirical research. In order to corroborate the propositions of the knowledge-based view, it would be highly beneficial to develop means, by which knowledge determinants and different areas of knowledge could be measured.

A good example of the issue is the evolutionary knowledge management model presented in Figure 6. Empirical research should determine, whether the causal links of the

model are relevant and measurable. If the model is accurate, effects of the knowledge determinants should be visible and measurable in the competitive advantage of the company.

Further research should also be done in the area of theory formulation. Based on the results of the empirical literature, more links between the different internationalisation theories should be established. A particular need exists for a theory taking in account the effects of personal characteristics of entrepreneurs or managers and of personal and business network contacts. In other words, there is a need for a unifying theory of internationalisation, which uses elements from born-global theory, the network model and the knowledge-based view of internationalisation.

The underrepresentation of the RBV/dynamic capabilities is surprising and calls for further research. Research should be conducted in order to determine, whether this absence is due to methodological issues in this study or to other reasons. One interesting area of research would be the relationship between the RBV/dynamic capabilities view and born global theories.

Another important issue is the significance of personal and professional relationships and network contacts. The empirical literature indicates clearly that especially personal network connections can have a significant impact on a company's internationalisation. Further research in this area should be conducted in order to refine the network model of internationalisation.

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**APPENDIX 1: JOURNALS INCORPORATED IN THE STUDY**

- Academy of Management Journal
- Canadian Journal of Administrative Sciences
- Critical Perspectives on International Business
- Entrepreneurship & Regional Development
- Entrepreneurship theory and practice
- European Business Review
- European Journal of Marketing
- European Management Journal
- Industrial and Corporate Change
- Industrial Marketing Management
- International Business Review
- International Journal of Business Research
- International Journal of Entrepreneurship and Innovation
- International Journal of Euromarketing
- International Journal of Production Economics
- International Marketing Review
- International Small Business Journal
- Irish Journal of Management
- Journal of American Academy of Business
- Journal of Business Venturing
- Journal of Engineering and Technology Management
- Journal of Enterprising Culture
- Journal of Global Marketing
- Journal of International Business Studies
- Journal of International Entrepreneurship
- Journal of International Marketing
- Journal of Management
- Journal of Strategic Change
- Journal of World Business
- Management Decision
- Management International Review
- Marketing Intelligence and Planning
- Small Business Economics
- Technovation
- Thunderbird International Business Review

**APPENDIX 2: DEFINITIONS OF INTERNATIONALISATION**

- Johanson and Vahlne (1977): Increasing involvement of a company in foreign markets.
- Piercy (1981): Outward movement in an individual firm's or larger grouping's international operations.
- Welch and Luostarinen (1988): Inward or outward movement of a firm's international operations.
- Beamish (1990): The process, by which firms both increase their awareness of the direct and indirect influences of international transactions on their future, and establish and conduct transactions with other countries.
- Calof and Beamish (1995): The process of adapting firms' operations (strategy, structure, resources etc.) to international environments.