

EFFECT OF INTERNAL CAPABILITIES ON INTERNATIONALISATION OF THE SMALL INFORMATION AND COMMUNICATION TECHNOLOGY FIRMS

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ABSTRACT

The aim of the paper is to study the effects of a firm's distinctive capabilities on internationalisation strategy and performance. The knowledge-based view of the firm is a dynamised extension to a well-known resource-based view of the firm, and it is seen as a useful approach in our study. In changing and unpredictable environments, in which small knowledge-intensive information and communication technology firms operate, knowledge-based resources are seen to contribute most to performance. Based on this argument, we explore the internationalisation process of small knowledge-intensive firms from the knowledge-based perspective. Internal capabilities are operationalised by marketing, technical, organisational and financial capabilities. We also study the effect of international experience (i.e. knowledge about foreign markets and operations) as it can also be seen as a part of internal capabilities.

The empirical investigation uses a sample of 124 Finnish small and medium-sized firms providing value-added services in information and communication technology sector. 71 (58 percent) of these firms operate internationally. International experience is confirmed to be a significant determinant of internationalisation strategy and performance. In addition, financial capabilities measured by excellent investment expertise, connections with venture capitalists and good financial management prove to be significant. Implications and directions for future research are discussed.

1. INTRODUCTION

As more and more small and medium-sized enterprises (SMEs) become international there is a growing interest in frameworks through which this development can be studied and described. Operating on international markets demands resources, skills and capabilities which SMEs often lack. Nevertheless, many of these internationalising firms are not following traditional incremental internationalisation models and are actually using various different patterns in their internationalisation process. In the information and communication technologies (ICT) industry this phenomenon is evident. The main aim of this paper is to study the effects of internal capabilities on internationalisation, i.e. to test if they could explain the internationalisation patterns and performance of small knowledge-intensive technology-based firms like the ones operating in the ICT domain.

The so-called knowledge-based view (KBV) of the firm is an extension to a well-known resource-based view (RBV) of the firm (e.g. Wernerfelt 1984, Barney 1986) which has its roots in the theory of the firm (Penrose 1959). RBV sees that resources or capabilities which can give a firm a competitive advantage should be valuable, rare, inimitable and nonsubstitutable (Barney 1991). Amit and Schoemaker (1993) refer to *capabilities* as the capacity of a firm to effectively and efficiently use resources to produce different products and services. In dynamic, i.e. changing and unpredictable environments, the knowledge-based resources are seen to contribute most to performance (Miller and Shamsie 1996). On the basis of this argument, we explore the internationalisation process of ICT SMEs from the knowledge-based perspective.

The present study attempts to extend the body of knowledge in the area of relationships between internal capabilities, internationalisation and international performance. Firstly, we look at the existing studies related to internationalisation and knowledge-based SMEs. Secondly, our theoretical framework is explained, and the developed hypotheses are tested empirically with an Internet-based survey of Finnish SMEs from the ICT sector. The final section of the paper includes conclusions and implications for studies of internationalisation of small knowledge-intensive firms, and provides managerial guidelines and suggestions for future research directions.

2. INTERNATIONALISATION OF SMALL AND MEDIUM-SIZED KNOWLEDGE-INTENSIVE FIRMS

The last decades have seen the increasing trend in the internationalisation of SMEs. The growth in numbers in SME internationalisation is facilitated by many trends and facts. These include e.g. the deregulation and liberalisation of markets, modern communication and transportation technologies and the globalisation of both businesses and individual consumers (see e.g. Oviatt and McDougall 1995, Knight 2001). Internationalisation has been defined as “the process of increasing involvement in international operations” (Welch and Luostarinen 1988:36).

There are several behavioural based *stage models of internationalisation* (e.g. Johanson and Vahlne 1977, 1990; Bilkey and Tesar 1977) through the which internationalisation process has often been studied. Recently there has been more evidence of and research on internationalisation of SMEs, and many service or knowledge-intensive firms seem not to

follow the traditional incremental internationalisation patterns (see e.g. Bell 1995, Oviatt and McDougall 1997). Several terms have been used to describe the firms which “leapfrog global”; these include e.g. *born globals* (see Rennie 1993) and *international new ventures* (Oviatt and McDougall 1997). There seems to be a consensus among the researchers that none of the internationalisation theories can alone explain the dynamics of the internationalisation of small, knowledge, technology or service intensive firms¹ (see e.g. Coviello and McAuley 1999). Jones (1998) has noticed that internationalisation, at the early stages of a firm’s life, is less of a functional activity than a direct process of growth and development. This means that there is room for the more strategic approaches to the studies related to internationalisation of knowledge-intensive SMEs.

Some authors have used the RBV as a “common meta theory” behind internationalisation or the choice of the international growth strategy (see e.g. Andersen and Kheam 1998, Peng 2001). This use is supported through the shared, common theoretical assumptions. For example, although it is not explicitly stated, the stages model of internationalisation rests on the RBV. The core explanation of the model is based on the increase in market knowledge and the classification of this knowledge is based on Penrosian tradition. Thus, also from this viewpoint the evolutionary view or the KBV of the firm offers us a good theoretical basis for our endeavour.

Knowledge-based view of the firm, while accepting much of the content of the RBV², pays more attention to the process or path by which the specific capabilities evolve and develop. This notion of the evolution of capabilities and knowledge through time stems from evolutionary economics (e.g. Nelson and Winter 1982, Foss and Eriksen 1995). An important concept is *partial replication* in creation of knowledge, i.e. the capabilities are seen to develop over time through partial replication of the processes of the firm. Learning is seen as a key element for long-term competitive advantage (Kyläheiko 1998). The KBV/RBV tradition argues that the resources and capabilities a firm possesses should define the essence of the firm’s strategy (Rumelt 1984, Andersen and Kheam 1998).

We refer to intangible assets, resources, capabilities and competencies as knowledge. To measure what a knowledge-based resource or capability is and what type of value it provides to its possessor is often context specific and hard. Wilkins et al. (1997) see knowledge assets consisting of “*facts, assumptions and heuristics which provide economic value to their possessor*”. Following Grant (1996), it is enough for us to acknowledge that there are many types of knowledge that are relevant to a firm. In the following chapter the knowledge-based view of internationalisation is presented in a more detailed manner.

¹ Autio et al. (2000) suggest that “knowledge intensity reflects the extent to which a firm depends on the knowledge inherent in its activities and outputs as a source of competitive advantage”. Knowledge creation and the use of knowledge have been seen as especially noticeable in high-technology sectors (see e.g. Eisenhardt and Schoonhoven 1990), and research and development (R&D) is often seen as an indicator of knowledge intensity (see e.g. Kuivalainen et al. 2002). Thus, depending on the context of the study it is possible to use the terms knowledge-based and technology-based as synonyms.

² The term knowledge-based view of the firm overlaps broadly with the so-called dynamic capabilities view (see e.g. Teece et al. 1997). Both approaches as well as even the recent definitions of the RBV focus on knowledge inventories, capabilities or resources as a source of competitive advantage in a dynamic environment. Here the term knowledge-based view is used, although the terms KBV and dynamic capabilities view could be used interchangeably. It is also important to notice that the boundaries between the concepts of resources, capabilities and skills are not clear (see e.g. Andersen and Kheam 1998; Amit and Schoemaker 1993).

3. KNOWLEDGE-BASED VIEW OF INTERNATIONALISATION

In our view, the competitiveness of the knowledge-intensive firm and hence the basic motive behind internationalisation is based on the firm's organisational resources and capabilities. The presence of certain types of resources and capabilities can trigger the internationalisation of the firm or change its pattern.

In earlier studies, knowledge-intensity of the firm's capabilities has been found to be a regulator of the internationalisation strategies or patterns of technology intensive small firms (e.g. Autio and Burgel 1999, Crick and Jones 2000). There is also a consensus among researchers that as SMEs tend to have fewer resources to become international than their larger counterparts, they should have superior (tacit) knowledge about global opportunities and superior capabilities to leverage them to possess the competitive advantage and overcome entry barriers (Liesch and Knight 1999, Fahy 2002). Andersen and Kheam (1998) argue that management's perception of capabilities is more relevant (measurement) in an international strategy formulation process than sustainable competitive advantage, and we follow this line.

3.1 Internal functional capabilities and their relationships to internationalisation

Several factors have been hypothesised to affect internationalisation. These include for example, organisational, institutional (e.g. regulations) and industrial (e.g. competitive forces) factors (Brush and Vanderwerf 1992). Knowledge and expertise in different functional competencies have been found to be positively related to international growth (e.g. Cavusgil and Zou 1994, Kogut and Zander 1993). The intensive search revealed that there are many different existing classifications of different types of resources and capabilities, and measurement scales presented in the literature. For example, Spanos and Lioukas (2001) divide capabilities into technical, marketing and organisational ones. A classification of functional capabilities of the firm including technology, marketing and organisational (i.e. management practises and resources) and financial resources planning is used in our analysis.

Technical capabilities are among the most recognised determinants of success in small knowledge-intensive firms (McGrath 1994, Zahra 1996). Technology can be seen as a sum of a firm's knowledge and skills, which determine the ability of technology-based ventures to offer products and services, gain market acceptance, survive at the market and achieve financial success (Zahra and Bogner 1999). In our empirical sample (i.e. technology-based SMEs), it is evident that technological skills and superior product/service is a necessity for a firm to gain superior international performance.

Marketing capabilities, for example, the ability to learn customer needs and position its product successfully, (see e.g. Zahra *et al.* 2000) can be seen as significant determinants of success even for technology-based small firms. Technical skills are often not enough. McGrath *et al.* (1995) notice that a new firm must learn other skills. For example, existing knowledge related to the market is seen as an important skill, as in many cases small firms follow focus/niche type strategies with an aim to service chosen market segment needs. Wolff and Pett (2000) argue that customer service and high quality marketing strategies need a much narrower resource base than e.g. brand strategy, and are then more possible for SMEs. Internationalisation is a market penetration strategy, and thus, it can be assumed that a firm planning to grow successfully through internationalisation has to possess marketing capabilities above average.

Organisational capabilities: according to Teece et al. (1997) organisational capabilities include e.g. managerial competencies related to organisational and managerial processes, knowledge and skills of employees, and an efficient organisational structure. In an international context there is a need to manage, transfer, regenerate and acquire knowledge within a firm across national and firm boundaries, and choose a suitable operation mode to support this. Managerial capability, i.e. the role of the management experience and an ability to manage the firm's operations has been emphasised in many studies related to performance (Eisenhardt and Schoonhoven 1990).

Financial capabilities: smaller firms tend to have fewer financial resources and have more difficulties in obtaining the necessary funds for product development, marketing, exporting and internationalisation in general (see e.g. Lee et al 2001, Westhead *et al.* 2001). A firm's ability to obtain financial resources (i.e. connections to different types of investors) and to manage these resources may enable the firm to secure new markets and operate successfully in them. Financial capabilities in the SME context have been studied through different types of measures, including e.g. investments made in the firm in a certain time period (Westhead et al. 2001). Lee et al. (2001) suggested that having linkages within the venture capitalists is an important indicator of performance.

3.2 International experience and international strategies seen through the lenses of knowledge-based view

When observed through the lens of dynamic capabilities view (i.e. KBV), international expansion and the related internationalisation processes appear to be most easily understood in terms of a firm's progressive cumulation of knowledge (Knudsen and Madsen 2002). The key to understand the development of the firm's internationalisation patterns is the so-called *absorptive capacity* (Cohen and Levinthal 1990), i.e. the capability to recognise, assimilate and apply information to the use. However, the patterns of knowledge generation and the ability to use it in all markets are not always linear. Some products might have a global appeal, and some information is more easily transferable to different markets. For example, some ICT products, e.g. tailor-made software, require marketing function which is able to identify customers' needs and modify the firm's knowledge base accordingly. In contrast, packaged software can be sold rather easily without high involvement at the end-user markets, for example through the Internet.

Learning about internationalisation is a cumulative process, in which all the steps or activities in international markets increase the experimental knowledge of a firm (Johanson and Vahlne 1977, 1990). The implications of the firm's learning process are that the past contributes to its current knowledge base. As in the development of all capabilities, the internationalisation skills are *path dependent* (see e.g. Eriksson et al. 2000) and develop through partial replication. The capability of the firm to engage itself in international operations is often measured through the experience and commitment of the firm in international operations (e.g. measured through countries served, years of international operation, and operation modes used), or especially in the SME context through the management's or partners' experience (see examples of different measures, e.g. in Lu and Beamish 2001, Eriksson et al. 2000).

The experience and degree of commitment to internationalisation (these can be seen as internationalisation capabilities) manifest themselves through a firm's internationalisation strategy. The followed internationalisation strategy has an effect on the amount of risk and

level of control a firm has in its international operations. The operation mode is one of the main indicators to assess strategy. The main categories of the foreign operation modes are exporting (in its different forms), co-operative modes (e.g. licensing, joint ventures, strategic alliances) and investment modes/foreign direct investments (FDIs). In exporting the degree of resource commitment and the level of control are lowest, as the establishment of FDIs needs more resources offering at the same time the highest level of control. In theory, the FDI offers additionally the highest-level information flow. Erramilli (1991) found out that software firms choose widely from different patterns of internationalisation and there are several reasons for operation mode choice, e.g. market seeking and client following. Other measurements of international strategy can include the scale of operations, i.e. the number of markets served. The strategic decision behind this choice often stems from the personnel (e.g. management's experience/contacts related to the market/country), the distance (i.e. physical and geographical distance between home and foreign market), and country market factors (strategic factors related to e.g. market potential, customer pull/push, defensive/attacking strategy etc.). Thus, the theory postulates that both internal capabilities and market opportunities made available by different capabilities (to which a firm responds with a certain type of internationalisation strategy) determine the direction of a firm's growth (see e.g. Andersen and Kheam 1998). Leonidou et al. (2002) notice that there appears to be a strong association between export marketing strategy and export performance measures³.

4. HYPOTHESISED EFFECTS BETWEEN EXPERIENCE, CAPABILITIES, STRATEGY AND INTERNATIONAL PERFORMANCE OF ICT SMEs

Based on the discussion above, we argue that there is a causal relationship between internal capabilities (both managerial and organisational), internationalisation strategies and international performance (see Figure 1). Eight hypotheses consistent with the KBV have been formulated. Hypotheses H1 and H2 are based on the development of cumulative knowledge and capabilities through experience. We argue that because of cumulative knowledge and experience through partial replication there should be a difference between international and domestic firms in their perceived level of capabilities. H3 tests an experience-commitment link following the stages theory. H4 and H5 are rooted to the KBV as they see different capabilities as a basis for strategy formulation. In general, greater capabilities in different functional skills should lead towards the use of investment type operation modes. In this area though, the empirical research on knowledge-based capabilities has not yet reached maturity (see e.g. McEvily and Chakravarthy 2002), and our research can partly be seen as explorative regarding to the linkages between capabilities and other constructs. We are interested in the effects of different types of capabilities on the internationalisation target market strategy, and on entry mode choice. H6, H7 and H8 concern the linkages between other constructs and performance.

H1 Firms' international experience is positively related to the development of capabilities.

³ The majority of empirical studies use subjective perceptual measures of international/export performance (Leonidou et al. 2002). Traditional performance measures include financial goals (profit-related, sales-related and market share related). Depending on measurement purposes, also non-financial measures have been used (such as managers' satisfaction with fulfilment of export objectives). In this study performance is measured with both subjective and objective performance measures.

H2 Firms operating in the international markets have greater functional capabilities than firms operating solely in the domestic market (as they have gained experience from their operations in the international markets).

H3 Firms' international experience increases commitment to internationalisation (and the use investment operation modes/FDIs).

H4 The choice of the internationalisation target market strategy pursued by a firm varies by the type of capabilities possessed by the firm.

H5 The form (operation mode) of internationalisation pursued by a firm varies by the type of capabilities possessed by the firm.

H6 The internationalisation strategy a firm follows has an effect on the international performance.

H7 The international experience of the firm is positively related to the international performance.

H8 A firm's greater capabilities have an effect on the international performance.

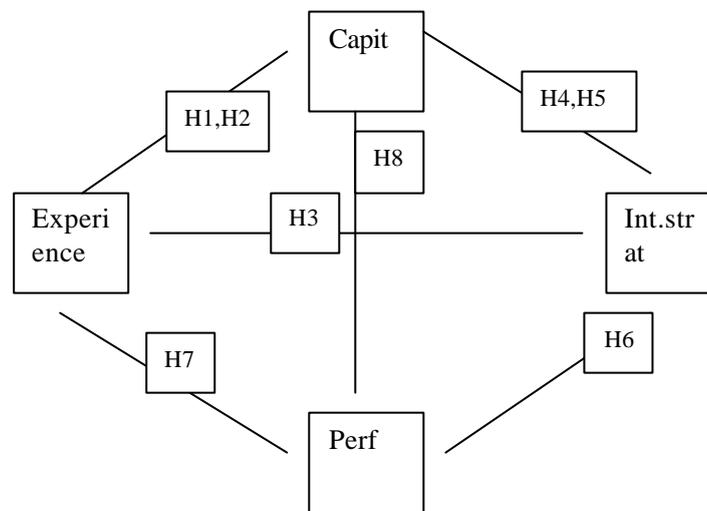


Figure 1 Tested hypothesised links between experience, capabilities, internationalisation strategy and performance.

5. DATA AND METHODOLOGY

5.1 Collection and description of the data

The empirical data used in the paper was collected in Nov.-Dec. 2001. Since the companies of interest were defined as small and medium-sized Finnish companies providing value added services in the ICT-sector, an Internet survey was considered an easy and fast way for the company managers to participate in the survey. The target population included content providers and software providers for service platform and management systems. Hardware manufacturers and companies providing mainly educational or consultancy services were excluded from the study. Due to the rapid development of the ICT sector and the unsuitability of standard industry classification codes, there was no single up-to-date sampling frame available for the purposes of the study. Therefore, the names and contact information of the

companies were searched from multiple sources, e.g., Kompass Finland Database, The Statistical Bureau of Finland database of Finnish companies, Internet sites of the companies themselves, incubators, venture capitalists, and industry organisations.

The sample covered 493 companies. They were at first contacted by telephone. Those 386 companies found suitable and that agreed to participate were sent e-mails with instructions and the url-address for the questionnaire. A reminder message was sent to those who had not returned their answer within two weeks. 124 companies returned their answers, and the effective response rate was 31.2 % (124/386). The response rate can be considered adequate as the questionnaire was rather extensive and the respondents were mainly managing directors with busy time schedules.

The validity and reliability of the results were secured by several means. For example, the questionnaire was carefully pretested in a number of firms. Furthermore, the questionnaire was targeted to managing directors who are considered as the most knowledgeable informants regarding internationalisation issues in SMEs. Comparison of early and late was conducted to assess nonresponse bias (cf. Armstrong and Overton 1977). No significant differences were found between these two groups. Table 1 provides descriptive information of the respondent companies. The companies were established between 1954 and 2001, but the median value of the establishment year was 1996 indicating that the companies participating in the present study were actually quite young. On average, the turnover of the companies was 2.91 million euros, and the median value for the turnover indicates that in fifty percent of the companies the turnover was equal to or less than 0.47 million euros. 58% of the companies had international operations, but average length of international experience was only three to four years. All major sectors of the software industry were represented in the study: 67% of the companies were selling software products, while 49% customised their software for each client and 12 % produced software embedded in different devices. Additionally, 43% of the companies also included training and consulting as part of their offering.

Table 1. Descriptive information of the respondent companies

	Mean	Median	Std Deviation	Minimum	Maximum
Turnover in 2001 (million €)	2.91	0.47	9.15	0	84.09
Establishment year	1994.3	1996	6.75	1954	2001
Fulltime employees in 2001	29.9	10	76.01	0	720
Start year of international operations	1997.3	1998	3.76	1984	2001

5.2 Measurement

The paper includes measurement constructs for companies' core capabilities, internationalisation strategies, experience of international operations and performance. Measures for core capabilities are purely summated scales formed from the statements included in the survey. These statements were mainly adopted from previous studies (e.g. Spanos and Lioukas 2001) but their reliability was assessed, and factor analysis was applied to confirm the scales. Principal component analysis with no rotation was conducted, and based on the factor loadings some scales were refined.

Internationalisation strategy was assessed in terms of country selection criteria and operation modes used. The country selection criteria included 14 items measured on a five point Likert scale. Principal component analysis was applied again (see Appendix 1). The components were labelled as personnel based criteria, distance based criteria, and criteria based on country characteristics. Personnel based criteria discusses companies own management and personnel, and their former experience of international operations. Distance based criteria refers to the physical distance of the target market (see e.g. Johanson and Vahlne 1977). The country-based criteria include the cultural aspect, the state of the target country etc. The final scales were formed as mean value of the items having their highest loading on each dimension. Internationalisation strategy is discussed also from the entry mode point of view. Three categories of entry modes are taken into account in a simple way, i.e. whether the company applies export operation modes or not, and similarly the cooperation entry modes and FDIs.

Subjective performance was measured with six Likert-scale items (1= disagree totally, 5=agree totally). A principal component factor analysis was conducted on the items yielding two factors, (subjective quantitative and subjective qualitative performance) together explaining 58,5 % of the variance (see Appendix 2). Taking an average of all the highest loading items formed the final scales for subjective quantitative and subjective qualitative performance. Internal consistencies of the scales were good (Cronbach a:s were .91 for subjective quantitative and .69 for subjective qualitative performance). Objective performance was measured with six items that were combined to a single measure. This measure was obtained by principal component analysis, where all items loaded on a single factor accounting for 64,3 % of the variance in the six original items (see Appendix 3).

The measure for experience is formed on the basis of duration of international operations. This measure is often used as a proxy for experience (Erramilli 1991). The descriptive statistics and reliabilities of the final measure scales are presented in Table 2. The generally applied acceptability limit for Cronbach's alpha has the value .70, but the benchmark of .60 can be also applied (e.g. Hair et al. 1998). Thus, the measure scales in Table 2 were considered to meet the reliability criteria for the analysis.

Table 2 Descriptive information and reliabilities of applied measures

	N of obs.	N of items	Mean	Std.dev.	Cronbach's α
Organisational capabilities (ORCAP)	121	9	3.95	.55	.86
Marketing capabilities (MACAP)	121	8	3.56	.62	.77
Financial and resources capabilities (FICAP)	121	3	3.47	.86	.73
Technological capabilities (TECAP)	120	5	3.94	.51	.70
Personnel based criteria (PBCR)	54	3	2.38	1.12	.86
Distance based criteria (DBCR)	54	4	2.32	.90	.65
Country characteristics based criteria (CBCR)	54	5	3.12	.99	.83
Objective performance (OBPERF)	48	6	.27	1.00	N/A
Subjective quantitative performance (QNPERF)	54	4	2.57	1.01	.91
Subjective qualitative performance (QLPERF)	55	2	3.80	.82	.69
Experience (EXP)	55	1	3.71	3.75	N/A
Export operation mode (EOM)	44	1	.55	.50	N/A
Cooperative operation modes (COM)	44	1	.39	.49	N/A
FDI (FOM)	44	1	.34	.48	N/A

5.3 Testing the hypotheses

Independent sample t-test, correlation and multiple linear regression were the three methods applied to assess the proposed hypotheses. First, the hypotheses were tested by computing correlations between the measures. These are shown in Table 3. Hypotheses H1 and H2 concerned the link between experience and functional capabilities. Neither H1 (experience - greater capabilities) nor H2 (internationally operating firms – greater capabilities) were supported. This may result from the young age of the firms in the sample. For example, the differences in cumulative experience gained from international operations may not be significant yet, as some firms may still be at the product development stage.

The length of international experience is positively related to using FDI operation mode which supports H3 and the stages model in general. However, the experience does not seem to enhance capabilities significantly. The latter may be partly due to the cross-sectional nature of our study as capabilities are seen to evolve over time, or the fact that the usefulness of experience is related to limits to transfer it (see e.g. Knudsen and Madsen 2002). Capabilities and strategy are related so that financial capabilities are positively related to using FDIs (supporting in its part our exploratory H5) and choosing target countries based on personal factors. This result supports the notion that the linkages to different investors and financial resource management skills give firms more possibilities to use different internationalisation strategies. These external investors can also be seen as an enabling network; for example, many venture capitalists have good connections with their foreign counterparts and other possible support organisations.

Those with less organisational capabilities use less cooperative modes, and those with better marketing capabilities use more FDIs. Thus, the existence of marketing capabilities seems at least to make a small technology-based firm independent in international operations (supporting H5, i.e. differences in strategy based on different types of capabilities possessed). Good organisational skills seem to lead to non-cooperative operation modes. One reason for this result could be that such skills make firms capable of handling international operations independently as well. In total, these results support partly H4 (internationalisation target market strategy) and H5 (operation mode). The use of different types of internationalisation strategies is supported in many studies related to SME internationalisation (e.g. Coviello and McAuley 1999) and our results are in line with them. However, it has to be noticed that there are not many significant differences in strategies based on different capabilities in our sample. Technical capabilities seem not to affect the strategy choice at all (H5 not supported in this case). This may be due to the fact that technical skills form a basis for existence to ICT SMEs, but not actually for strategy choice. However, the results are partly inconclusive in this matter as we have not included the determinants of nature of knowledge in our analysis (e.g. tacitness of the technical knowledge and appropriability regime could be seen as useful additions, see e.g. Teece et al. 1997).

Table 3 Correlation matrix

	Exp	Eom	Com	Fom	Cbcr	Pbcr	Dbcr	Ficap	Orcap	Tecap	Macap	Qnperf	Qlperf	Obperf
Exp	1,000													
Eom	,062	1,000												
Com	-,070	-,401	1,000											
Fom	,294	-,306	-,374	1,000										
Cbcr	,117	,243	-,032	,052	1,000									
Pbcr	,127	-,090	-,121	,415	,263	1,000								
Dbcr	-,114	,330	,061	-,223	,533	,227	1,000							
Ficap	,095	0,051	-,151	,338	,040	,278	,132	1,000						
Orcap	-,158	,199	-,317	-,100	-,083	-,214	,072	,240	1,000					
Tecap	-,179	-,053	,064	-,123	-,113	-,061	,166	,366	,463	1,000				
Macap	,158	-,176	-,061	,304	,152	,077	,033	,313	,481	,248	1,000			
Qnperf	,356	-,130	,036	,261	,099	,066	-,119	,213	,134	,026	,162	1,000		
Qlperf	,284	,067	,044	,114	,205	,114	,067	,258	,091	,147	,006	,380	1,000	
Obperf	,403	,045	,034	,027	-,008	-,014	-,305	,298	-,049	-,039	-,110	,499	,336	1,000

A three-staged regression analysis was conducted in order to test the performance hypotheses. Table 4 gathers the results.

Table 4 Regression results

<i>Dep.</i>	<i>Block</i>	<i>R²</i>	<i>Adj. R²</i>	<i>Sig. F change</i>	<i>Indep.</i>	<i>B</i>	<i>T</i>	<i>Sig</i>
Obperf	1	.151	.057	.193	Ficap	.482	2.431	.020
					Orcap	.041	.119	.906
					Tecap	-.290	-.819	.418
					Macap	-.343	-1.183	.245
Obperf	2	.367	.156	.153	Ficap	.606	2.818	.008
					Orcap	.132	.319	.752
					Tecap	-.179	-.491	.627
					Macap	-.390	-1.198	.240
					Cbcr	.311	1.620	.116
					Pbcr	.011	.069	.945
					Dbcr	-.664	-3.010	.005
					Eom	.202	.480	.635
Obperf	3	.505	.317	.008	Com	.329	.737	.467
					Fom	-.293	-.589	.560
					Ficap	.597	3.08	.004
					Orcap	.312	.83	.414
					Tecap	-.132	-.403	.690
					Macap	-.565	-1.887	.069
					Cbcr	.288	1.662	.107
					Pbcr	-.010	.070	.945
					Dbcr	-.578	-2.875	.007
					Eom	-.080	-.205	.839
					Com	.216	.535	.597
Fom	-.543	-1.189	.244					
Exp	.111	2.834	.008					

The adjusted R square of the regression model was .317, and objective measure of international performance was dependent on financial capabilities and experience. H7 stated that international experience is positively related to international performance. Thus, H7 is supported, and this result is in line with research related to the stages theory and KBV. H8 is supported only in the case of financial capabilities. It seems that in the early stages of internationalisation, SMEs' financial planning, networks and even a capability to handle the growth is an important determinant of performance. Although most of the capabilities are interconnected and often one type of capability is needed to gain another, this result is important as a possible basis for strategic planning.

In strategy-performance context there was only one significant indicator. Companies who put less emphasis on distance as a country selection criterion seem to perform better. This result supports H6. We may speculate that those firms who choose a country of a greater physical or cultural distance did so in cooperation with other firms either by following a customer or using a partner in their network (see e.g. Johanson and Mattsson 1988, Eriksson et al.2000).

For subjective performance measures, the model was not significant (quantitative as dependent variable $F=1.285$, d.f. = 11 and 31, sig.=.278, qualitative $F=1,12$, d.f.= 11 and 31, sig.=.379)

6. CONCLUSIONS AND MANAGERIAL IMPLICATIONS

This paper has investigated the effect of functional capabilities, experimental knowledge, and internationalisation strategy on international performance using the knowledge-based view of the firm as a theoretical perspective. The KBV can be seen as a good point of departure in studying internationalisation of the small-and medium-sized technology based firms which operate in an environment characterised by constant changes and rapid development of technologies. We have tried to increase the number of determinants of international performance from the traditional "stages" approach by including marketing, technical, organisational and financial capabilities in our analysis. Our results confirmed that experimental knowledge related to international operations is a significant determinant of international performance and increases the use of FDIs. The interesting question is, however, if the inclusion of capabilities and strategy determinants is fruitful.

Based on our results, the answer is affirmative, although we have to admit that there are not too many significant linkages between capabilities, strategy and performance in our sample. However, financial capabilities of the firm explained international performance. An excellent investment expertise, connections with venture capitalists and good financial management are important capabilities for a small firm with high growth aspirations. This notion is helpful as well for public policy makers, business incubators, science parks personnel and business angels. The training programmes meant for start-ups should include training related to different financial management skills and provide links to financial institutions. In the case of internationalisation strategy, less emphasis on country distance characteristics yielded better results. We can speculate for the reasons behind this result (e.g. if it is because of external networks and client following or because of the global mindset of managers). However, it is important to notice that our sample consisted mostly of software firms, whose biggest possible market is the United States. In many cases the market needs are global. It may be that

the use of rapid growth strategies, e.g. born global approach in internationalisation strategy gives a firm edge over its similar-sized and equally capable rivals.

There are several issues in our sample that can be considered as limitations. Firstly, we have only studied young and small information and communication technology firms. For many small firms, there are resource limitations (mainly financial but also others) in using some internationalisation strategies, although the firms would perceive themselves capable of doing them. Secondly, when predicting growth strategy and development of capabilities and experience, it would be better to use longitudinal research design. Although we have no reason to believe that there are validity or reliability problems, the quality of our work would increase in a longitudinal setting. Thirdly, the single industry survey formed a rather homogenous sample with little variations in some variables and a cross-industrial setting would be of interest.

Further research should also discuss the issue why perceived capabilities did not differ between the more internationally experienced and domestic operating firms. This result needs more research. However, we could suggest that this relates to the global mindset and international entrepreneurial orientation (see e.g. Knight 2001) as well as to the homogenous sample. Also more research is needed in the area of KBV in the international setting. Even after a long period of conceptual work, there are few studies that focus on the relationships between resources/capabilities and the firm's internationalisation. For example, there are no existing common scales for knowledge-based measures. Thus, although there are limitations in our work, we believe that this research has contributed to our knowledge of the capabilities' effect on the internationalisation of small knowledge-intensive technology-based firms.

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Appendix 1. Factor structure of internationalisation strategy

	Country	Person	Distance
Geographic proximity to the domestic markets	,47		,67
A similar culture to that of the domestic markets	,61		,46
Observed market potential in the target country	,54		
The easiness with which skilled local staff can be hired		,79	
Management's previous experience in the target country		,90	
The low barriers to business	,77		
The aim to lower costs	,43	,28	,55
The need to often be in face-to-face contact with clients			,74
The existence of potential partners in the target country		,35	,21
Management's previous personal contacts in the target country		,87	
Developed distribution/retail channels in the target country	,41	,30	-,39
By operating in the target country, we will best prevent the copying of our products			,51
The stable political situation in the target country	,87		
The stable economic situation in the target country	,89		
Eigenvalue	4,53	2,03	1,47
% of variance	32,4	14,5	10,5

Appendix 2. Factor structure of subjective performance

Item	Loading on Quantitative factor	Loading on Qualitative factor
We have met our international market share objectives	.941	.125
We have achieved the turnover objectives we set for internationalisation	.922	.145
In general, we are satisfied with our success in the international markets	.900	.150
Internationalisation has had a positive effect on our company's profitability	.703	.311
Internationalisation has had a positive effect on our company's image	.159	.863
Internationalisation has had a positive effect on the development of our company's expertise	.169	.848
Eigenvalue	3.51	1.21
% of variance	58.5	20.1
Cronbach alpha for mean scale	.91 (4 items)	.69 (2 items)

Appendix 3. Factor structure of objective performance

Item	Objective performance
Estimated share of turnover from international markets in 2002	.945
Estimated share of turnover from international markets in 2003	.881
Percentage of foreign customers	.830
How many % of your turnover comes from foreign markets	.808
In how many countries, in addition to Finland, does your company operate / have clients	.676
Share of foreign partners	.622
Eigenvalue	3.86
% of variance	64.3 (6 items)