

Internationalisation in Nordic and Baltic science parks

A report on park activities and firm needs

Lars Bengtsson,
Marie Löwegren
School of Economics and Management
Lund University
P.O Box 7080
S-220 07 Lund
Sweden
Tel: +46 46 222 4648, +46 46 222 7326
E-mail:
lars.bengtsson@fek.lu.se
marie.lowegren@fek.lu.se

Final report to Nordisk Industrifond
Project P99133/Analyse af internationalisering i Fou-Parker

Preface

This report is about internationalisation in the Nordic and Baltic science- and technology parks. More specifically it describes what the Nordic and Baltic science- and technology parks do (and not do) in order to support and stimulate internationalisation of the park and the localised firms. It also describes what kind of support the firms would like to receive in internationalisation issues as well as report three small case studies on internationalisation projects currently in progress in some of the Nordic parks. Finally we discuss our most important findings and draw some conclusions regarding the future work of internationalisation in the Nordic and Baltic science- and technology parks.

The study has been initiated by Swedepark and Ms Gertrud Bohlin Ottosson, CEO of Ideon Center AB in Lund, Sweden and responsible for Swedepark's internationalisation program. Ms Gertrud Bohlin Ottosson has also acted as project leader. The study was commissioned to the School of Economics and Management at Lund University in Sweden. Lars Bengtsson (DBA) and Marie Löwegren (MSc) have carried out the study and written the report.

The study has received financial support from the Nordic Industrial Fund (Baltic countries, Nordic countries) and The National Board of Technical and Industrial Development – NUTEK (Sweden).

Finally, we would like to thank all 53 Nordic and 5 Baltic science- and technology parks and their firms that have participated in the study. We were impressed that all science parks in the Nordic and Baltic countries actually agreed to participate in the study, and of the great interest for the project that we perceived in our telephone interviews with park management.

Lund in December 2000,

Lars Bengtsson

Marie Löwegren

Contents

Executive summary.....	4
Introduction.....	6
Aim and scope of investigation.....	7
Analysis and results of park survey	9
Business advice capacity	10
Plan for internationalisation	11
Multinational and foreign firms	11
Activities aiming at internationalising the firm.....	12
Analysis and results of park firm survey	14
Current co-operations.....	14
Ambitions of and reasons for internationalising	15
Sources of information	16
Science-park services	17
Countries of interest for the firms	18
Firms opinions about the activities in the science park.....	19
The Icelandic firms.....	21
China Link – a bilateral, consultant driven, market entrance project.....	22
Firms and costs.....	22
The structure of the project	22
Changes to come	23
Results of the project.....	23
Global Software – Finnish firms entering the US market.....	23
Firms and costs.....	24
The structure of the programme	24
The result of the programme	24
Canadian Swedish matching of innovative SME's – a bilateral partnership- matching project using embassy resources	25
Firms and costs.....	25
Structure of project.....	26
Result of project	26
Discussion and conclusions	26
Intent of internationalisation	27
Supply and demand of internationalisation services	27
Countries	28
Projects of internationalisation.....	29
Internet and other information sources.....	30
Resources for internationalisation.....	30

Executive summary

Many new technology-based firms are localised in science- and technology parks in the Nordic and Baltic countries. Given the importance of internationalisation of these firms it becomes interesting to investigate the internationalisation activities in the parks as well as the firms' perceived needs of support.

The aim of the study is to:

- Describe and analyse internationalisation activities in the Nordic and Baltic science- and technology parks,
- Describe and analyse the perceived needs of the Nordic and Baltic science- and technology park firms,
- Describe and analyse some interesting cases of internationalisation activities in some of the Nordic and Baltic science- and technology parks.
- Discuss the most important findings and draw conclusions regarding the future work of internationalisation in the Nordic and Baltic science-and technology parks.

The study has been carried out through a park survey (telephone interviews), a firm survey (web-based questionnaire) and case studies. The analysis of the whole material has resulted in the following conclusions and recommendations:

- The firms express a strong intent to internationalise. At the same time few Nordic and Baltic parks have given the internationalisation issue strategic importance and/or work systematically with the issue. We recommend that the park management and other supporting organisations need to pay more attention to the internationalisation issue.
- Firms do not know what kind of internationalisation service (if any) the park can provide and where to find it. This is especially pronounced in Denmark, Norway and Sweden. The parks need to inform their firms more and better about what the firms can expect in this area.
- Firms wish to receive advice and help on an individual basis or groups of firms with similar needs and interests. Parks need to reflect how they could expand their activities and competence to work in a more individual fashion with the firms.
- Firms want help and advice from experienced business consultants, especially consultants with international networks that could act as “door openers” for the firms. Market research, financing of international competence development and matchmaking with foreign partners are other important activities. Parks need to reflect on how they can provide access to such persons and networks to the firms. A “package” of all these services, i.e., door openers, international business consultants, market research, financing of international competence development and matchmaking, would of course be a highly valued service by the firms.
- Many parks provide and promote matchmaking with foreign partners through Innovation relay Centers (IRC). IRC is however virtually unknown by the firms. Make IRC and its services known to the firms.
- Many firms value international marketing of the park and recruitment of selected foreign firms to the park. Parks need to reflect on how they best, in co-operation with the firms, internationally market the park and which foreign firms to attract to the park.
- The outstanding countries of interest are; the other Nordic and Baltic countries, USA, Germany and the UK. Especially the other Nordic and Baltic countries seem to be overlooked by the parks. Other countries are also of interest for the firms, however of

more limited interest. Bilateral projects to these countries may require that several parks, several regions and/or several countries (making them multilateral) to co-operate in order to attract interest from a sufficiently large group of firms.

- Internationalisation projects seem to be an effective way to assist smaller firms' internationalisation. Such projects should be organised for a group of firms and offered regularly. Thus, science parks need to discuss how they can co-operate and develop joint projects between parks, regions or countries. We suggest that the Nordic science park network and/or the individual Nordic science park associations (Swedepark, FIN, TEKEL and FFP) initiate formal co-operation with the Baltic science park network (BASTIC) in order to find out if joint projects in the internationalisation area could be of interest.
- After customers, the Internet is the second most important external information source on internationalisation issues. There is a need for most science parks and their firms to review their home pages in order for them to function as a good external information source for other firms and organisations. A minimum should be to have home pages in English and to have an accurate list of firms in the park with links to the firms' home pages.
- Firms have rated established internationalisation-supporting organisations like export agencies, technical attaches, embassies etc as fairly unimportant sources for information. Science parks need to reflect over the possibility to make the services of organisations like Chambers of Commerce, export agencies, technical attaches, embassies and the like more visible and easy to access for the firms.
- Finnish and Icelandic firms are more supported on internationalisation issues and are more knowledgeable about and satisfied with the support they get. They also perceive internationalisation as more important than the other Nordic and Baltic countries' firms. Finnish parks also have more resources and a larger capacity to support their firms. In conclusion, we would suggest that the Danish, Norwegian, Swedish, and the Baltic countries' authorities who are assigned to support the development of small- and medium-sized firms, make a closer study of the Finnish example and evaluate if this is an interesting way to support technology-based firms' internationalisation in science parks as well as outside science parks.

Introduction

Why is internationalisation an important issue for science- and technology parks and the firms located in the parks?

As science parks actively should facilitate the links between the nearby university or higher education institution, most firms are likely to be so called new technology-based firms (NTBFs). A new technology-based firm sustain its competitiveness primarily on a technology that is based on science and/or engineering knowledge. This technology should in principle be patentable. According to Granstrand¹, technology has the following general properties: a) it is linked to an artefact, b) it is linked to science, c) it has a relatively high degree of codifiability, d) it has a practical purpose link, e) it has links to globally oriented systems like the patent system, standardisation systems etc, and f) it is possible to protect by patents. Because of these properties technology tends to evolve dynamically and also to be global in nature, thus internationalisation is a common phenomena even among young and small technology-based firms.

The global character of technology creates global markets for the products and processes based on technological knowledge. Even though technologies are patentable, NTBF:s can expect international competition because of the technology's dynamic evolvement. This is one reason why NTBF:s should engage in early-stage internationalisation in order to grow and be competitive. Another reason, specifically for NTBF:s originating from small countries like the Nordic and Baltic countries, is the small domestic markets making early internationalisation essential. This may however also apply to NTBF:s coming from larger countries because the products and processes on which these firms base their operations might be highly specialised corresponding to a very narrow market niche. Thus, in order to grow these firms have to become international, serving their customers on a global scale.

For firms in certain industries internationalisation is not only an issue of growth, it might be an issue of survival. The last years of development in especially the IT-sector has shown the importance of timing and fast responses in so called emerging technology markets. To take an early and global market position in these markets has proven to be a very important competitive advantage. In these industries first-mover advantages seem to be especially important, in fact important to the extent that competition in these industries has been described as "the-winner-takes-it-all". Thus, for some new technology based firms early internationalisation is a necessity for long term survival and competitiveness.

NTBF:s internationalisation is not only a question of presence on international product markets, it may also concern the presence in the places where the technological knowledge is especially advanced and developing fast, so called "hot-spots". One such "hot-spot" should of course be their own science-park but there might also be other technological "hot-spots" in other parts of the world for the same or related technological knowledge.

Some NTBF:s also need to be present on the international venture capital markets in order to secure enough investment capital to finance product development activities and costs associated with the growth and expansion of the business.

¹ Granstrand, O (1998) Towards a theory of the technology-based firm. Research Policy, vol 27, pp 465-489.

Recent research² on 100 NTBF:s firms in the Cambridge and Oxford regions also give empirical evidence on the importance of internationalisation. This research showed that the more successful firms in the sample (performing better in terms of growth and profitability than average) had more elaborate local network (with other local firms and with the university) as well as a more elaborate international network (with foreign customers, suppliers, universities, partners etc) than the less successful firms. Thus, in general, it is not enough for a NTBF in a science park to have good local network, they also need to develop an international network.

Given the importance of internationalisation of NTBF:s the fundamental problem is how new technology-based firms with limited managerial and other types of resources could be stimulated and supported to access and establish themselves on international markets. Even though some of these firms may have highly-qualified entrepreneurs who may have exceptional qualities in exploiting international market opportunities, these firms still face other types of problems, i.e., lack of capital, lack of internationally experienced personnel, lack of international distribution channels etc.

As NTBF:s become increasingly important for the growth and renewal of many developed countries' economies the issues of internationalisation of NTBF:s grow in importance. Thus, it could be argued that not only the firms themselves could gain from early internationalisation but also the society as a whole creating economic and employment growth.

Aim and scope of investigation

Many NTBF:s are localised in science- and technology parks in the Nordic and Baltic countries. Given the importance of NTBF:s internationalisation, as previous discussed, it becomes interesting to investigate the internationalisation activities in the parks as well as the firms' perceived needs of support. According to the four Nordic science-parks' co-operative organisations (FFP, FIN, Swedepark, TEKEL), this is not very well known. Moreover, there is a need to describe experiences as well as results of interesting internationalisation efforts performed in the Nordic and Baltic science-parks in order to share knowledge about these efforts between the parks.

The aim of the study is to:

- Describe and analyse internationalisation activities in the Nordic and Baltic science- and technology parks,
- Describe and analyse the perceived needs of the Nordic and Baltic science- and technology park firms,
- Describe and analyse some interesting cases of internationalisation activities in some of the Nordic and/or Baltic science- and technology parks.
- Discuss the most important findings and draw conclusions regarding the future work of internationalisation in the Nordic and Baltic science-and technology parks.

The survey of the parks' internationalisation activities were performed by telephone interviews with a representative from the science park management, most often the managing director of the science-park and in some cases other persons in management that were responsible for internationalisation practices in the park. The sample consisted of all full

² Keeble, D; Lawson, C; Smith, H L; Moore, B & Wilkinson, F (1998) Internationalisation processes, networking and local embeddedness in technology-intensive small firms. Small Business Economics, vol 11, pp 327-342.

members in the association of Danish science parks, FFP, the Finnish science park organisation, TEKEL, the Norwegian science park organisation, FIN, the Swedish association for science and technology parks, Swedepark. In addition, two Icelandic parks named Impra at IceTec and Nysköpunarsetur at the University of Iceland were contacted, and the members of the Baltic science park organisation BASTIC. All parks contacted agreed to participate, in total 58 parks. The project also had the aim to contact Western Russian parks. Through Finnish contacts at Oulu University we received contact details for three so called technoparks: in Murmansk, Arkhangelsk and Petrozavodsk. The contact persons in Arkhangelsk and Petrozavodsk responded that they felt their parks were in a very early phase of their development, and that they did not have much to contribute with on the issue of internationalisation. The park in Murmansk did not respond to our contacts. Thus, we decided to exclude the Western Russia parks from the investigation.

Most interviews took place in February until June 2000. Thus the answers reflect the situation in the beginning of the year 2000. The exemption is the Baltic and Icelandic parks whose management were interviewed in September 2000. Before the interviews, e-mails were sent to the science park, typically the managing director, describing the research project and asking for the appropriate person to contact and a suitable time to call. In the cases where the park's management did not respond, a reminder was sent and in some cases the managing director were contacted directly by phone. In preparation for the interviews, the park's home pages were located and scanned for relevant information. Interviews typically took some 30 minutes and the answers were recorded on paper during the interview. The answers have been compiled in condensed form in exhibit 1.

We collected the information concerning the science park firms' perceived needs of internationalisation support by a web-based questionnaire. We constructed four language versions of the questionnaire, one in Danish, one in Finnish, one in Swedish, and one in English. Technical reasons made it impossible to have additional language versions. Thus, the Norwegian firms received a questionnaire in Danish, a language Norwegians should have very few problems understanding. The Baltic and Icelandic firms got a questionnaire in the English language. The English version of the questionnaire is shown in exhibit 2.

The questionnaire was sent to the firms with an e-mail address on the science parks web pages. In a few cases the science-park did not list their firms on the web page or the list was not up-to-date. In those cases we asked for a list of the firms' e-mail addresses to be sent to us. Two parks did not manage to send a list of their firms, and one park did not have any firms until the autumn 2000 (Andra Varvet). Concerning the Swedish Kista science park, we only included the firms in Electrum since these are small high-technology based firms whose opinions are of interest in this study. Among the Baltic science parks, two did not have e-mail addresses to some of their firms (Latvian Technology Park and Tallinn Technical University Innovation Centre). We therefore sent the questionnaire via e-mail to the park management who had agreed to distribute it. From the e-mail lists we excluded firms that we could clearly identify as service firms in the park (park administration firms, restaurants, cleaning firms, banks etc), university departments or the like, voluntary organisations and funds. Quite a few firms on the web pages did not list an e-mail address, which resulted in that they could not receive a questionnaire.

We sent 1693 questionnaires to the Danish, Finnish, Norwegian, and Swedish science park firms in the beginning of June. 106 of these were returned as undeliverables, i.e., their e-mail address was not correct or the firm had moved or shut down. Thus, 1587 questionnaires

reached the firms. In the beginning of August, we sent a reminder to the firms, and also e-mailed park management in the Danish, Finnish, and Norwegian science parks asking them to help us convincing the firms of the necessity to respond to the questionnaire. The response rate was somewhat higher for the Swedish firms, so park management here did not receive this e-mail. The Baltic and Icelandic firms received their questionnaires in the beginning of November and a reminder two weeks later. We sent 91 questionnaires to the Baltic and Icelandic firms and received 6 in return as undeliverables. All in all we sent 1672 questionnaires to the firms in the parks. Due to the low amount of firms (and science parks) in each of the Baltic countries, we have chosen to analyse Estonia, Latvia, and Lithuania as one group.

In total 360 firms submitted answers to the questionnaire, giving a response rate of 22%. This might appear as a low response rate, but in an international perspective this is quite normal. It should be noted, however, that only five Icelandic firms have submitted answers to the questionnaire. Even if this was a good response rate given that the questionnaire was only sent to six Icelandic firms, we have chosen to report on the Icelandic firms in a separate section of the firm survey results, thereby making the reader aware of the small number of responses that these results are based on. We tried to estimate how many of the 1672 firms that seemed mainly to be consultant firms (technical and management) and thus might be less interested in internationalisation. We identified 482 technical consultants and 199 management/business consultants. The science parks had also reported that about 150 firms in the parks were multinational firms. These firms might also feel it to be less relevant issues for them. Thus, of the 1650 firms, about 800-900 might be real NTBF:s. The sample is described in more detail in exhibit 3.

In terms of interesting internationalisation activities we identified three projects (two Finnish projects and one Swedish project) where some interesting experiences have been gained and some preliminary results of these activities could be identified. The three cases described in this report are China-link, Global Software and the Canada-project. The three cases are not intended to be a description of best practices, they are merely intended to show how science-parks may work in order to support early internationalisation of NTBF:s. Even though we identified several other interesting examples of internationalisation projects and activities in the Nordic parks, the effects of these activities were hard to assess. Thus, we have prioritised cases where something could be said about the effects of these activities.

Analysis and results of park survey

The parks in the sample differ in many regards. As the table below shows, the first parks were founded in Sweden and Finland. The first Danish and Norwegian parks came some 4-5 years later, and the Baltic and Icelandic parks have only recently been established. The majority of parks were established between 1986 and 1995, except in Sweden where many new parks have been established in recent years. The Baltic and Icelandic parks are all very small, and the Danish, Norwegian and Swedish parks are generally smaller than the Finnish parks. While Sweden has most of the small parks together with the Baltic countries and Iceland, Denmark and Norway have most parks in the medium size categories (26-75 firms), and Finland has most of their parks in the large category (76 or more firms). Four parks in Finland have more than 100 firms (Otaniemi Science Park, Tampere Technology Center, Technopolis, and Turku Technology Center) and three parks in Sweden (Ideon, Mjärdevi and Uppsala Science Park).

Park estbl	Danish parks	Finnish parks	Norwegian Parks	Swedish parks	Icelandic parks	Baltic parks
-1985	0	3 (30%)	0	6 (22%)	0	0
1986-1990	5 (83%)	5 (50%)	3 (38 %)	8 (30%)	0	0
1991-1995	1 (17%)	2 (20%)	4 (50%)	2 (7%)	0	3 (60%)
1996-	0	0	1 (12%)	11 (41%)	2 (100%)	2 (40%)
Sum	6 (100%)	10 (100%)	8 (100%)	27 (100%)	2 (100%)	5 (100%)

Table 1. Distribution of science parks according to age.

Firms in the park	Danish parks	Finnish parks	Norwegian Parks	Swedish parks	Icelandic parks	Baltic parks
1-25 firms	0	1 (10%)	3 (38%)	11 (41%)	2 (100%)	2 (40%)
26-50 firms	4 (67%)	1 (10%)	1 (12%)	8 (30%)	0	3 (60%)
51-75 firms	2 (33%)	3 (30%)	3 (38%)	5 (18%)	0	0
76 – or more	0	5 (50%)	1 (12%)	3 (11%)	0	0
Sum	6 (100%)	10(100%)	8 (100%)	27 (100%)	2 (100%)	5 (100%)

Table 2. Distribution of science parks according to size.

The profiles of the parks in Denmark, Finland, Norway and Sweden are rather similar. All except two Danish parks, two Finnish parks, two Norwegian parks and six Swedish parks, report that their major, or one of their major groups of firms, belong to the IT-cluster. Second most common area in these countries is biotechnology with four Danish parks, three Finnish parks, two Norwegian parks and nine Swedish parks. Other areas include medical technology, pharmaceuticals, environmental technologies, marine technologies, electronics, and automation. The Baltic countries and Iceland do not seem to have any particular concentration of industry in their parks. All exempt Tallinn Technical University Innovation Centre (which major group of firms is reported to be IT-firms) report to house a mixture of high-tech firms in different industries.

Business advice capacity

In terms of business advice capacity “in house” Baltic parks, Icelandic parks, Danish parks, Swedish parks and to some extent Norwegian parks seem to have adopted the agent-approach, having none or very few business advisors in the science park management organisation. Thus, the firms in these parks have to be recommended to contact other organisations in order to get the advice they want. The exceptions are the Danish park CAT, Campus Kjeller, Leiv Eiriksson Nyfotek and Ås Science Park in Norway, and Aurorum in Sweden. These parks seem to have a larger business advice capacity than the other parks in their countries. Finnish parks in general seem to have more resources and have between 4 to 20 business advisors. Thus, they can act as competence centres, i.e., firms can find the expertise they want “in-house”. However, not all competencies needed are located “in-house” even in Finnish parks. Park management typically reports highly specialised services, e.g., international patents, international licences, and international financing, to be handled by independent consultants. Some parks have tried to expand their advice capacity, utilising board members’ expertise and/or business expertise from the university located nearby.

Business advisors	Danish parks	Finnish parks	Norwegian Parks	Swedish parks	Icelandic parks	Baltic parks
0 - 5 advisors	5 (83%)	3 (30%)	5 (63%)	26 (96%)	2 (100%)	5 (100%)
6 - 10 advisors	0	3 (30%)	3 (37%)	1 (4%)	0	0
11 – 15 advisors	1 (17%)	2 (20%)	0	0	0	0
16 – 20 advisors	0	2 (20%)	0	0	0	0
Sum	6 (100%)	10 (100%)	8 (100%)	27 (100%)	2 (100%)	5 (100%)

Table 3. Distribution of business advice capacity “in-house”.

Plan for internationalisation

Even though most science park managers report that internationalisation is high on their agenda, very few parks have any plan or strategy for their internationalisation activities. Only four parks report any kind of plan in this area, but these parks have also a very broad plan for their internationalisation activities. In general, internationalisation does not seem to be an issue discussed very systematically by management and/or the board/owners of the park in any of the Nordic or Baltic countries. However, almost all parks report some activities in the internationalisation area.

Multinational and foreign firms

One way to internationalise the park is to attract internationally active firms and foreign firms to localise in the park. As the park is supposed to facilitate communication between firms, internationally active firms may stimulate and transfer knowledge to domestically active firms. This in turn might motivate the domestic firms to expand internationally, and also give them the opportunity to take advantage of the international firm’s global network. Some researchers stress the importance of large multinational firms in science parks because they will transfer knowledge to other firms, both technological and market knowledge, helping these firms to grow. From that perspective the survey has revealed a rather disappointing picture. Most parks have very few large multinational firms represented among their firms.

Nr of multint’l firms	Danish parks	Finnish parks	Norwegian parks	Swedish parks	Icelandic parks	Baltic parks
0 firms	0	1 (10%)	2 (25%)	12 (44%)	2 (100%)	4 (80%)
1 - 5 firms	4 (67%)	7 (70%)	5 (63%)	13 (48%)	0	1 (20%)
6 - 10 firms	0	2 (20%)	1 (12%)	2 (8%)	0	0
11 - firms	2 (33%)	0	0	0	0	0

Table 4. Distribution of multinational firms located in the parks.

The most internationalised parks in this respect seem to be found in Denmark. The science-park of Hörsholm reports 25 multinational firms, and Novi 11 multinationals. The large amount of multinationals in Hörsholm might be explained by the close relations to university research. All firms in the park are said to have a connection to university research, and also use the international links that this provides. Of the Finnish, Norwegian and Swedish parks only 5 have 6 or more multinational firms. On the other hand not only quantity counts. Given the importance of the IT-cluster for many parks, one competitive multinational firm in the IT-industry might be more important than ten other multinational firms in other industries. Ericsson’s location in Ideon in Lund and Nokia’s location in Oulu have probably been of enormous importance for the local IT-clusters at both places.

Three of the Danish parks, six of the Finnish parks, five of Norwegian parks and 13 of the Swedish parks have responded that they actively try to attract international firms to the park. In some parks they have lack of space and thus do not promote this very actively at the moment. Most parks that try to attract firms do so in a selective way. Through discussions with firms in the park and the nearby university certain firms are targeted and then approached in order to market a localisation at the park and find out if the firm has any interest in the area. The most common arguments against attracting multinational firms are; priority on regional firms, not our task (property owner's task), lack of space and "haven't got around to it yet".

Few parks have tried to advertise in international media, and those who have, found the results disappointing. Those parks that seem most satisfied with their international marketing use a lot of PR. When many newspapers and magazines write about the park and their firms this creates a lot of interest for the park. The park management is then invited to give talks on meetings, conferences and so on, which creates even more publicity, which keeps the public interest running. Other channels for international marketing are sister-parks and other collaborating organisations.

Activities aiming at internationalising the firm

The survey differentiated between three forms of internationalisation support; general activities (offered to all firms in the park), international business advice offered to individual or smaller group of firms and special internationalisation projects.

Internationalisation activities	Danish parks	Finnish parks	Norwegian parks	Swedish parks	Icelandic parks	Baltic parks
General activities	5 (83%)	8 (80%)	3 (37%)	9 (33%)	0	2 (40%)
International business advice	5 (83%)	10 (100%)	7 (87%)	14 (52%)	1 (50%)	4 (80%)
Special projects;						
EU-funded projects	1 (17%)	9 (90%)	0	2 (7%)	2 (100%)	5 (100%)
National projects	1 (17%)	4 (40%)	0	8 (30%)	0	0
Regional projects	1 (17%)	4 (40%)	0	4 (15%)	0	0
Park projects	1 (17%)	3 (30%)	5 (63%)	5 (19%)	0	0

Table 5. Distribution of internationalisation activities.

Generally the parks in Finland tend to have more internationalisation activities towards their firms than Danish, Norwegian and Swedish parks. The most common form of internationalisation activity is internationalisation advice given ad hoc when business advisors encounter the need for such advice. Depending on subject area they might be able to give the advice themselves or recommend the firm to contact some other organisation or consultant that can handle the problem. Most parks report that the some of their business advisors have internationalisation experience, e.g., former international employment and/or personal international network, making it possible for them to hold some expertise in the area. The higher level of internationalisation activities in Finnish parks compared to the other parks is probably due to the difference in advice capacity. Many Danish/Norwegian/Swedish parks report that they have not encountered need for internationalisation advice among their firms or that the firms handle these issues by themselves.

There is also a significant difference between Finnish and Baltic parks and the rest of the parks in the amount of special internationalisation projects. Almost all of the Finnish and

Baltic parks run EU-sponsored projects, while only one Danish park and two Swedish parks report such projects. Especially the Finnish parks succeed in establishing projects sponsored in part by EU:s social fund. These projects are often sponsored in part by EU, in part by local, regional and/or national government organisations and also in part by participating firms. Several Swedish parks take part in Swedepark's Canada-project, a project open for all Swedepark's members aiming to facilitate contacts and relations between Swedish and Canadian high-tech firms. Some parks also have their own special internationalisation projects.

There seem to be a Finnish way of developing internationalisation projects. It starts with a Finnish science park developing and implementing an internationalisation project. If the project turns out to be successful, the project is diffused and copied by another science-park in another region. If it then continues to be a success, the project is introduced nationally by national organisations for all science park firms to take part in. An example of this is the China-link project originally developed by Tampere Technology Park and now implemented by several other parks. Another example is the Global Software-program originally developed by Jyväskylä Technology Park and Technopolis in Oulu. This program has expanded and is now run in four Finnish regions. This might explain why nearly all Finnish parks have special internationalisation projects and also why almost all are sponsored by the EU. The collaboration between the Finnish parks seems to rapidly diffuse good projects and also good ways of financing such projects (for more information on China-Link and Global Software see the cases below).

International networks

Finnish parks also seem to have more elaborate international networks than the Danish/Norwegian/Swedish parks. Most parks mention that they are members of the international science park association (IASP) and to some degree use this network.

International networks	Danish parks	Finnish parks	Norwegian parks	Swedish parks	Icelandic parks	Baltic parks
IASP	5 (83%)	10 (100%)	5 (63%)	12 (44%)	0	4 (80%)
EU networks	0	9 (90%)	0	4 (15%)	2 (100%)	5 (100%)
Other European ntwrks	2 (33%)	4 (40%)	5 (63%)	1 (4%)	0	5 (100%)
Sister park networks	0	4 (40%)	0	2 (8%)	0	0
Local networks	1 (17%)	1 (10%)	0	6 (22%)	0	0

Table 6. Distribution of international networks.

The Finnish parks to a large degree also mention different kinds of EU networks as important. Both the contacts they have with EU's Social Fund and regional funds but also the European Business Network (EBN) and their Centres (BIC) located in different parts of Europe are reported. Sister-parks are mentioned by four Finnish parks and two Swedish parks. The Finnish parks and Mjärdevi Science Park in Sweden mention such a network as most important in countries like China, where political contacts on different levels are important. Norwegian parks to a large degree mention the Nordic science-park network. The Baltic parks all mention BASTIC (Baltic Associations of Science-/Technology parks and Innovation Centers) as an important network.

Analysis and results of park firm survey

The majority of the firms³ that have answered the questionnaire are small firms, with a turnover of less than 2 million US\$, and with less than 10 employees. As could be seen in the table below, the exception is the Finnish firms that have reported greater turnovers in general. The majority of the firms are less than 6 years of age, although the Finnish firms in this survey tend to be somewhat older than the others are. 83% of the firms are keeping their ownership within the country, and less than 10% of them are part of a larger corporation with more than 500 employees. About half of the firms have grown with more than 25% a year the last three years and 41% of them are not engaged in exports at all. The Finnish and the Danish firms have reported more export than the firms in the remaining countries.

%	Total	Denmark	Finland	Norway	Sweden	Baltic states
Turnover 0-0,5 MUSD	45	54	15	57	49	65
Turnover 0,6-1,0	16	18	16	18	14	18
Turnover 1,1-2,0	12	21	16	12	10	6
Empl. 0-5	53	56	46	61	52	47
Empl. 6-10	17	15	18	14	17	12
Age 0-3	47	64	34	49	49	18
Age 4-6	20	13	28	29	15	41
Domestic owners	83	72	87	69	88	88
Part of corporation	10	8	8	12	10	0
Growth 25% or more	49	46	56	43	49	53
No export	41	26	33	49	45	29

Table 7. Background variables of the firms participating in the survey.

The firms in all of the countries are active in a wide range of different industries, although no Danish firms are in the electronics industry, and no Norwegian firms are active in the medical industry. What is striking though, are the great majority of IT-industry firms that have answered this questionnaire. In addition, the Danish firms seem to be rather well represented in the environment- and energy-technology and the Swedish firms reports several technical consultants.

Current co-operations

The firms' current co-operations with foreign actors concerning research and technological- or product-development seem to be most frequent among the Danish firms where 44% reports a regular co-operation with a foreign enterprise. As shown in the table below, the Danish firms also co-operate to a larger extent than the other firms with foreign universities (33%) and other foreign partners (33%). The Finnish, Norwegian and Swedish firms mostly co-operate with other domestic firms, while again the Danish firms differ when co-operating more with the domestic university. Concerning domestic co-operations, the Finnish firms reports more activities than the other countries, while the country that co-operates the least is Sweden which reports 39% of the firms to have no co-operations at all. The Baltic countries seem to co-operate with both domestic and foreign actors. According to this result, the Danish firms are those that are the most internationalised when it comes to research and development, while the Finnish firms concentrates on co-operations within their country. A possible explanation could be that the level of technological competence in the IT-industry is very high in Finland, why they find their best co-operative partners locally, while the Danish firms may

³ A specification of number of firms surveyed is found in Exhibit 3.

have to look outside their own country to find such expertise. The lack of co-operations in the Swedish firms could depend on the larger amount of consultants that have responded to the survey compared to the other countries.

%	Total	Denmark	Finland	Norway	Sweden	Baltic states
Foreign firms	34	44	28	33	31	65
Foreign universities	21	33	18	18	20	18
Other foreign partners	21	33	15	16	21	18
Domestic firms	50	46	69	41	47	53
Domestic universities	45	54	44	39	44	59
Other domestic partners	36	31	43	31	37	18
No co-operations	17	15	10	16	39	6

Table 8. Co-operations on research and technology- or product-development.

Ambitions of and reasons for internationalising

The firms do not, however, lack interest in an internationalisation process. In total 58% of the firms reports a strong or very strong ambition to internationalise their activities. The highest ratings come from Finland (72%), and Denmark (67%). The most frequently given reason for internationalisation is the limitation of the domestic market and that internationalisation is built into the business idea. The third most frequent reason is to keep up with technology development. When asked about reasons for not to internationalise, the most frequent answer is lack of capital (16%), followed by that the domestic market is big enough (12%), and lacking knowledge of foreign markets (12%), lack of time (11%), and have not found a suitable international partner (10%). Looking at this in each of the countries, the table below show that the Finnish and the Norwegian firms seem to find lack of capital to be the major hindrance, while the Swedish firms seem to think that the domestic market is big enough. This could again be an effect of the many consultants participating in the Swedish survey, who normally only serve the local market. Alternatively, it could be that the domestic market is big enough for many Swedish firms, being the largest market of the four countries. The Danish firms have low ratings of all factors, which would indicate that they do not find large hindrances to internationalise their activities. As mentioned above it is also the Danish firms that are engaged in most co-operations abroad compared to the other countries.

%	Total	Denmark	Finland	Norway	Sweden	Baltic states
Domestic market big enough	12	8	7	10	15	0
Lack of time	11	3	10	16	12	12
Lack of capital	16	5	33	22	13	6
Lack of knowledge of foreign markets	12	5	21	8	11	6
No suitable partner has been found	10	5	26	12	5	24

Table 9. Major reasons for not internationalising

Sources of information

The sources of information about international conditions concerning international markets and marketing that the firms find important show quite homogeneous results among the studied countries. The diagram below shows the most important source to be the customers, closely followed by the Internet. Here, we should remember that the majority of responses to the survey came from firms in the IT-industry, who presumably uses the Internet to a great extent. Close behind these two is fairs and conferences rated, and next down the scale we find a cluster consisting of four sources; professional publications, market surveys, universities, and competitors. It should be noticed, though, that the Baltic countries find the export supporting organisations more important as sources of information than the rest of the countries. The lowest ratings, i.e., the sources that are *not* perceived as important by the firms, is patent bureaux, banks and accountants, other science parks, the Chamber of commerce, embassies and technical attachés, and finally the own science park. The exception is the Baltic firms that perceive export support organisations to be more important than the firms from the Nordic countries. It might be unwise to conclude that these latter sources of information are useless to the firms. Alternatively, this result could tell us that the firms are not aware of how to use these latter sources of information, and of what information they could gain from them.

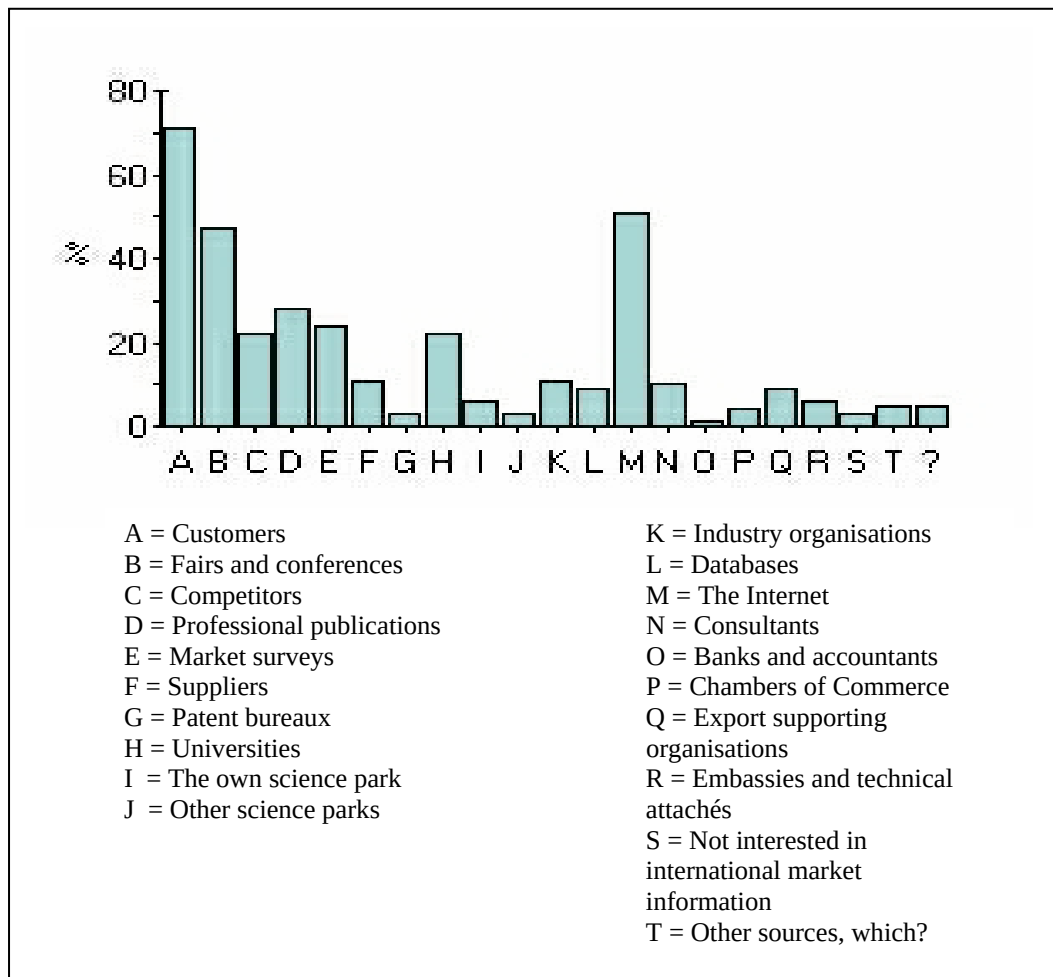


Figure 1. The most important external sources of information about international conditions concerning markets and marketing as perceived by the firms.

The same question was asked referring to sources of information when it comes to international technical development. The pattern is the same as in the previous question in all of the four countries, although the university has gained somewhat higher ratings in general.

Science park services

The most wanted help from the science park regarding internationalisation matters is perceived to be individual advice from experts (40%), closely followed by exchange of experiences with other firms (36%), projects of internationalisation together with a group of other firms with similar needs (34%), and seminars/workshops with experts (30%). There are small differences among the countries as could be seen from the table below. The Danish and the Norwegian firms seem to appreciate exchange of experiences with other firms the most, while Finnish firms, as well as Baltic firms, are more interested in projects of internationalisation, and Swedish firms of individual advice from experts. This might be explained by Finnish firms having more experience on internationalisation projects than other firms. Few firms are however interested in general information gained through courses or general written information like newsletters.

%	Total	Denmark	Finland	Norway	Baltic states
Individual advice from experts	40	36	48	45	29
Seminars/workshops with experts	30	23	26	41	29
Projects with group of firms with similar needs	34	28	51	33	53
Exchange of experiences with other firms	36	41	28	49	35
General information through courses	3	3	5	4	18
General written information	12	13	10	8	24

Table 10. Firms' opinions on forms of assistance from the science park.

From the kinds of services the firms would like to find in the science park, two seem to be more important than the others; an international network of “door-openers” to international markets, and business consultants with international experience. After these two, we find a cluster of three services; financing of the firms' international competence development, market analyses, and supplying contacts to suitable international firms. Of somewhat lesser interest is the next cluster of services; technical consultants with international contacts, an international network of “sister-parks”, and access to contact databases. Of very little interest to the firms is the following five services; supplying consultants, arranged courses to learn about foreign countries, joint journeys to international fairs, international patent advice, and international licensing advice. The low interest in patents and licences could again be due to the high rate of IT-industry firms in the survey. The firms in the different countries are quite homogeneous in their responses to this question. What might be interesting to note is that it is only the Danish firms that find the service of supplying contacts to international venture capital somewhat important. It may also be worth noticing that the firms in the Baltic

countries find the service of technical as well as management consultants more important than the rest of the countries' firms.

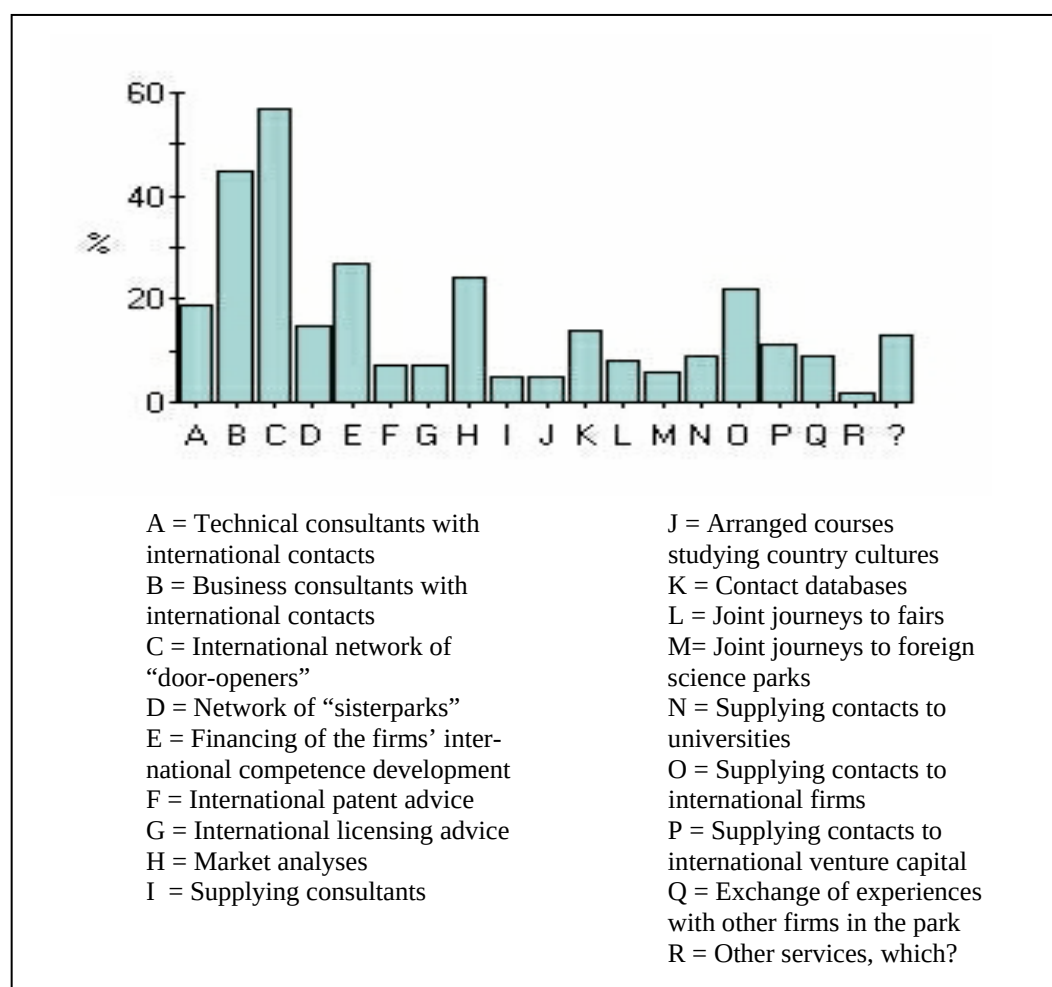


Figure 2. Types of internationalisation services the firms would like to find in the science-park.

45% of the firms in the survey find it important or very important that the science-park actively recruits international active firms to locate in the park. 30% of the firms find it neither important nor unimportant, and the remaining 21% find it unimportant.

Countries of interest for the firms

The tendency is quite clear among the companies in the four countries when it comes to what countries are the most interesting concerning marketing of their products. As the table below shows, the top four countries are; the other Nordic countries, Germany, Great Britain, and the USA. After these four countries there is a gap down to France. There are only very small differences among the surveyed countries. In Denmark, Finland, and in the Baltic states, Germany is rated as the most important country, whereas in Norway and Sweden the other Nordic countries are perceived most important from a market perspective. The Baltic countries also find Russia and the Baltic neighbours to be interesting countries when it comes to marketing of their products.

%	Denmark	Finland	Norway	Sweden	Baltic states
The Nordic countries	64	59	84	62	65
The USA	59	56	55	50	47
Canada	23	11	12	11	12
Great Britain	56	51	73	55	18
France	31	25	41	25	0
China	3	5	10	10	6
Japan	18	25	14	15	18
Spain	5	5	22	9	0
Germany	69	64	65	57	76
Italy	13	8	14	14	24
The Netherlands	5	13	27	11	6
Belgium	3	0	14	7	0
Russia	0	7	4	5	35
The Baltic countries	3	5	4	12	53
Poland	8	5	2	7	6
Austria	5	0	6	4	0
Greece	0	0	4	1	0
Portugal	0	2	6	3	0
Ireland	0	0	4	7	0
Switzerland	8	10	6	4	24
India	3	2	6	3	0
Australia/New Zealand	13	2	6	7	0
Brazil	3	2	10	5	0
Thailand	0	2	0	1	1
Taiwan	3	2	0	1	1
Korea	3	3	2	1	12
Other countries	10	7	8	4	6

Table 11. Most interesting countries for marketing products.

The most important countries from a research and technology development perspective are not much different from the market perspective. The difference is that the USA has become the most important country, followed by the other Nordic countries, Germany, and Great Britain. This pattern is consistent among all of the surveyed countries, although the Baltic countries find their Baltic neighbours interesting as well.

Firms opinions about the activities in the science park

As could be seen from the table below a quite surprising result appeared, especially in the responses from the Danish, Norwegian, and Swedish firms, when asking the firms if they knew whether their science park provided service and advice regarding internationalisation matters. More than half of the firms in these countries responded that they did not know, 26% of the responding firms in all of the surveyed countries answered “no”, i.e., their science park do not provide service and advice in these matters, and only 20% gave the answer “yes”, their park offers this service. Only 11% of the firms have ever used the service. It must be noted that none of the Danish firms recognise that their science parks provides internationalisation advice, and that it is the firms in the Baltic countries and the Finnish firms that are most aware of this facility and also the ones that have most frequently used it. The Finnish firms as well

as the Baltic firms also to a greater extent than the other countries' firms think that this service is important or very important. 58% of the firms think it is of importance to market the science-park internationally to make it known, and again it is the Finnish and Baltic firms that have the highest ratings.

%	Total	Denmark	Finland	Norway	Sweden	Baltic states
Science park provides int. service	20	0	46	12	12	71
Science park do not provide int. service	26	41	26	20	26	0
Do not know if science park provides int. service	52	56	25	65	58	29
Have used this service	11	0	28	8	6	47
Important or very important that the science park provides int. service	47	36	74	47	40	59
Important or very important that the science park is marketed internationally	58	59	70	45	56	76

Table 12. Firm knowledge, usage, and perceived importance of service provision in the science-park.

It seems like the Baltic and Finnish firms are more aware of existing offers of internationalisation advice, and also of the importance of this service provided in the park. Other explanations could be that they use their location in another way than the other firms do, or that the science parks in these countries have a more developed service organisation than the parks in the other surveyed countries. There is however a lack of knowledge among all the firms in the surveyed countries when it comes to the Innovation Relay Centres. As many as 82% of the surveyed firms did not know about these centres.

The firms also responded to the question if they would consider internationalisation more if service and advice could be found in the science-park. As could be seen below, 42% answered this question positively, with the highest rates in the Baltic states (65%) and Norway (61%). However, approximately just as many firms would not consider internationalisation anyway. Here also, the exception is the Baltic states and Norway, where the firms apparently (to a greater extent than in the other countries) would appreciate more internationalisation advice and services in the science parks. Not very surprisingly, even more firms would consider internationalisation if the advice and service in the science-park were free of charge. The exemption is the Baltic countries, where the firms apparently are willing to pay for this support.

%	Total	Denmark	Finland	Norway	Sweden	Baltic states
Would consider internationalisation if service was found in the science park	42	44	33	61	38	65
Would not consider internationalisation even if service was found in the science park	44	41	46	33	49	12
Would consider internationalisation if service was found in the science park and was free of charge	50	67	39	67	46	59
Would not consider internationalisation even if service was found in the science park and was free of charge	38	28	48	27	42	18

Table 13. Firm consideration of internationalisation.

Most of the firms thus seem to think it is important that internationalisation advice could be found in the science parks, and about half of them would even consider internationalisation if this service were found, preferably free of charge.

The Icelandic firms

The two Icelandic parks were rather small and we identified only six firms to send the questionnaire to. Of these six firms, five firms answered the questionnaire. Thus, the response rate was extremely good. However, as the Icelandic survey is only based on five firm's responses we found it necessary to report separately on these results in order to remind the reader of the small sample. The Icelandic firms were all small (4 firms between 0-5 employees and 1 firm between 6-10 employees), many fast growing (3 firms more than 25% growth annually the last three years) and young. Three of the firms exported at least 51% of their turnover and they were all owned by domestic owners (except 1 firm having a foreign minority owner). Four of the firms had co-operation with foreign and domestic companies as well as foreign and domestic universities.

The results of the survey are more or less in line with the results for the other countries. Noteworthy differences are a strong ambition to internationalise (100% very strong ambitions), a strong preference for individual advice or seminars with consultants/experts (80%), a better knowledge of internationalisation support from their own park (100%) and higher usage of these services (60%). Moreover, 4 of the 5 firms feel they already have the internationalisation services they need and they are free of charge. IRC is as unknown as in the other countries, only 1 firm claim to know what it is.

Thus, we can conclude that the Icelandic firms seem to have very high internationalisation ambitions and that many of them also have internationalisation experience. The firms seem to be content with the services and the help they are provided by their park organisations.

China Link – a bilateral, consultant driven, market entrance project

The China Link⁴ project was initiated by a consulting company in Tampere called Netpoint Oy. This company contacted Tampere Technology Centre (where they were located) and suggested a co-operation. Netpoint had the idea of a project that would help companies enter into the Chinese market, and Tampere Technology Centre knew how to acquire financing for the project through the European Social Fund. Today, two projects have been run with the goal of giving Finnish firms entrance to China. Different forms of entry are offered, like for instance direct exports, agents, importers, R&D co-operations, a Chinese partner, hired resources, production, licensing, own office, and joint venture.

Firms and costs

Not every firm is allowed to join the China Link. Netpoint checks that the firm is financially stable and their product has a potential on the Chinese market. The firm also have to pay 20.000 FIM for entering the project. The European Social Fund pays 50% of the cost, and the participating firms pays 20% in money and 30% in time. The recruitment of firms is made on a regional basis, the critical mass being too small in the Technology Centre itself.

The structure of the project

The project starts with a 3-hour workshop (Workshop 1 in the figure below) individually held for each company. In the first workshop a pool of experts (1 or 2 from Netpoint and 1 or 2 consultants) discusses the current situation of the firm, and defines the needs of that firm. Based on what was found in that workshop, Netpoint then instructs their representatives in China to find what the firm needed, for instance interesting partners or just a check of the size of the market (Field Work in China in the figure below). This fieldwork emanates in a report, which is discussed in the next 3-hour workshop (Workshop 2 in the figure). Again there is a pool of experts present, and the discussion is held on a more strategic level, which may result in that the task of Netpoint is somewhat re-defined. The outcome of workshop 2 forms the basis of the next round of field work in China, which again results in a report of what has been found.

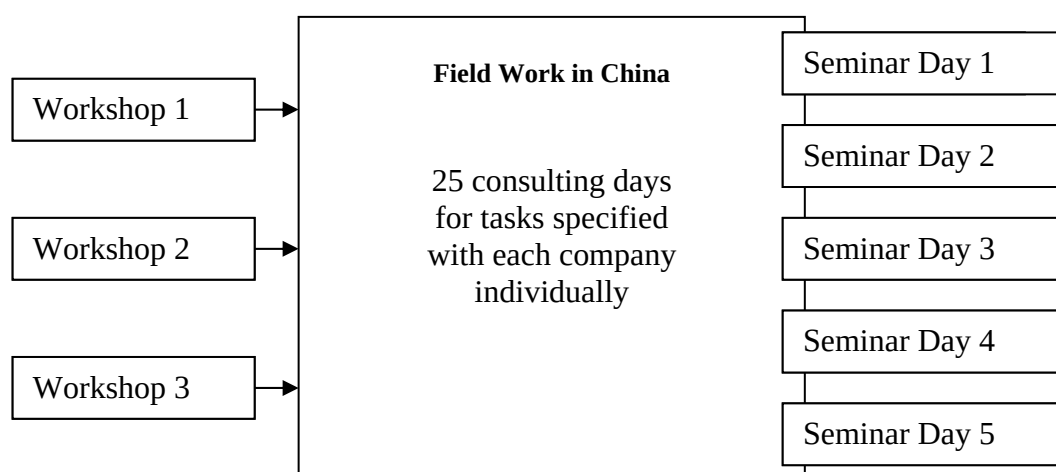


Figure 3. Structure of the China Link projects, from Netpoint International Ltd.

This serves as input to the 3rd workshop, where deeper discussions now could be held and result in input for the final field work in China. The project is concluded with a journey to

⁴ Sources: interviews with Netpoint representatives Jukka Maansikka and Juha Jyrkkäranta together with Project Manager Lea Vakkari from Tampere Technology Centre, 2000-07-05

China for the firms, where they should meet their potential partners. Parallel to the workshops and the fieldwork, seminars are given approximately once a month. These seminars cover everything from legal aspects to market aspects, joint venture contracts, Chinese culture, and so on.

Changes to come

With experience from two China link projects, Netpoint is now discussing a couple of changes in the structure:

- The seminars will be changed into modules and increase in number. The firms are then allowed to choose five modules of those offered to take part in. The reason for this change is that the companies turned out to be at very different levels of knowledge about internationalisation matters, which made the seminars not useful for some and maybe too complicated for some other firms. With modules, each firm can choose the topic and level that suites them.
- The workshops are going to be better defined. It will be decided beforehand what to discuss at each workshop in order to force progress.
- Instead of travelling to China a whole group of firms, they will start individual journeys, which will give Netpoint a better opportunity to serve each particular firm.
- Netpoint are also discussing to start an “after China Link” project in order to give the firms that did not reach all the way in the China Link a chance to get extra services and help. This “after China Link” project could be financed if 4-5 firms entered. In such a case the Ministry of Trade and Industry pays 65% of the cost.

Results of the project

The first China Link ran in 1995 with 10 companies participating. This project resulted in that 6 firms were developing their relations, 4 were trading, and 1 was working on a joint venture agreement. The second China Link had 15 companies participating, whereof half of them were engaged in commerce at the end of the project, 2-3 of them was involved in joint ventures and the rest (4-5) decided that they did not have sufficient resources or that China was not their market. The third China Link is scheduled to the autumn of 2000. A description of the project could be found on the web page: <http://www.hermia.fi/chinalink/>

Global Software – Finnish firms entering the US market

The Global Software⁵ program was initiated by the University of Oulu in co-operation with Technopolis and the Center of Expertise program for the IT-sector in Finland. In the first half of the 1990's the University of Oulu run a series of internationalisation seminars for IT-firms located in Technopolis and the Oulu region. Some years later the Center of Expertise program started in Finland and four regions in Finland were identified as especially strong in the IT-sector; Helsinki, Jyväskylä, Oulu and Tampere regions. In a discussion in the Center of Expertise program of how to best support the IT firms' internationalisation the experiences from Oulu were discussed. It was decided that Oulu and Jyväskylä should run a pilot program for IT-firms in the two regions and that Oulu was responsible for running the program. Oulu had good contacts with an American consultant in San Diego who had good contacts in the IT-sector in the US. They designed a program that would focus on business and management practices (not technology), US market entry and that the programme would include a visit to

⁵ Sources: <http://oyt.oulu.fi/globalsoftware> and interviews with Juhani Saukkonen, University of Oulu, Martti Launonen, Technopolis in Oulu and Jussi Nukari (e-mail), Jyväskylä Science Park.

Silicon Valley and contacts with interesting firms and venture capitalists prepared by the American consultant. The pilot programme with 14 firms started in November 1998.

Firms and costs

The Finnish government authorities were approached for funding of the program and after some negotiations the Finnish labour market department provided the needed funds. The program had a budget of 580.000 Euro. 14 firms (7 from Oulu and 7 from Jyväskylä region) were selected for the one-year program. Certain selection criteria applied. The firms had to be software firms with software as their primary product. Software firms working on project-basis (often on a local market) was not allowed into the program. The product niche the firm worked in must be in a strong growth phase. The management of the firm also had to be prepared to put in 2-3 months of full time work during the one-year period of the program. Other selection criteria like firm size, profit or earlier international expertise were considered less important in the selection process.

The pilot programme evaluations indicated high level of satisfaction from the participating firms. Thus, it was decided that the programme should be repeated but now with participants from all the four regions and the modules placed in all four regions but Oulu is still responsible for the programme. 16 new firms were recruited to the Global Software Program I that started in May 2000. Global Software Program II (another group of 16 firms) will start in September 2000. The budget for this programme is approximately the same as for the pilot programme. 40% of the cost is provided by the firms and the rest divided between the Finnish state and the EU funds.

The structure of the programme

The programme was structured in different modules with 2-3 day meetings alternating in Oulu and Jyväskylä. The first modules focused on business and management internationalisation issues in general and on the US market specifically. With the additional help of market research on the US market the firms were asked to construct a business plan for the US market. Then the firms went to the US for networking and discussion of their business plans with potential business partners and venture capitalists. Based on these experiences the firms had to revise and develop their business plans. The firms developed a final business plan and on a second visit to the US they formally presented the plan to potential business partners and to venture capitalists. For some firms this resulted in going into a test marketing phase while others had to develop their plan further or to meet other potential partners.

The pilot programme used 100% outside consultants in the programme and some 80% were American consultants. In the new programmes 10-15% will be run by “in-house” people. The rest by outside consultants, mostly American consultants. The new programmes starting this year have developed somewhat. Visits to the US market will not only go to the Silicon Valley, but also to other important IT-clusters in the US; San Diego, Seattle, and Boston. The programme is briefly described on the programme’s homepage: <http://oyt.oulu.fi/globalsoftware>

The result of the programme

The pilot programme evaluation gave excellent feedback from the participating firms. In terms of concrete results 4-5 firms have made the entry into the US market and an additional 4-5 firms have decided to do so but are still in a start-up phase. The rest have decided to postpone the decision for various reasons feeling that either the US market or the firm itself is not ready for the entry. However, all firms said that their business plans have developed

substantially and that they also had become more skilled in presenting their business plan to partners and venture capitalists. Because of this some firms had been able to attract venture capital from Finnish venture capitalists and on better terms than before the programme. A last result mentioned was the building and maintenance of the reputation of the Finnish software industry in the US. Finnish software firms have, after the success of Nokia, begun to achieve a reputation for being advanced in certain niches of the software industry. This programme helps to maintain and further build on this reputation, which is a valuable resource for all Finnish IT-firms going to the US market.

Canadian Swedish matching of innovative SME's – a bilateral partnership-matching project using embassy resources⁶

In late 1996 the Canadian Embassy in Stockholm proposed Swedepark to co-operate in identifying Swedish science park firms to establish partnerships with Canadian high tech firms. The proposition included the identification of some 30 firms in each country aiming at 3-5 partnership agreements within a year. Swedepark accepted the proposition and sought financial support for the co-ordination efforts from The National Board of Technical and Industrial Development (NUTEK). Initially the identification process started using personnel from the Canadian Embassy, but after financial support was granted from NUTEK Swedepark assigned personnel from Swedish science parks to assist the work. Swedepark assigned Mr Clas Reuterskiöld at Teknikhögden Technology Park in Stockholm to be the project leader on the Swedish side of the project. The project operated until June 2000.

The project was part of a strategic federal Canadian initiative to encourage extended investments from six countries (USA, UK, Japan, Germany, France and Sweden) in Canada. The Canadian embassy had access to different federal and state networks and organisations for support of SME's development and growth. Among these the Atlantic Canada Opportunities Agency proved to be the most important.

Firms and costs

From the beginning all Swedish science park based high-tech firms were targeted. However, the first years identification and matching processes resulted in most firms belonging to one of three sectors: 1) Information and communication technologies, 2) environmental and renewable energy technologies, and 3) Life sciences including bio-science and medical technologies. The second year of operation the matching processes focussed on these three sectors. The matching procedure has relied on certain information from the firms, so called company profiles. Company profiles for 52 Swedish and 113 Canadian firms could be accessed at the end of the project. Costs covering the matching procedure, the preparation and arrangement of partnerships meetings in Canada have been covered by the grant from NUTEK. Other costs have either been covered by the individual Swedish science parks (e.g., information to the firms) or by the firms themselves (e.g., individual meetings with potential partners).

⁶ Sources: Reuterskiöld, C (1999) Swedish science park company matching with Canadian high tech companies. Swedepark, June 1999.

Reuterskiöld, C (2000) Koordinering av företagsmatchningar mellan svenska teknologiparksföretag och kanadensiska företag, Etapp 2. Swedepark, juni 2000.
Intervju med Helene Larsson, Teknikhöjdens Teknikpark, Stockholm.

Structure of project

In order to match firms with each other and to arrange business meeting between potential partners the following method has been developed and used:

1. Development of standardised company profiles.
2. Marketing activities through science parks and Swedepark's homepage to Swedish science-park firms in order to interest them for matchmaking and to supply their company profile. (Corresponding efforts from the Canadian embassy and co-operating Canadian authorities.)
3. Matching of company profiles, e.g., on the virtual marketplaces <http://www.innovalink.org> and <http://www.technogate.com>
4. Organisation of partnership meetings in Sweden and Canada, if possible in conjunction with industry fairs or conferences.
5. Assistance during partnership meetings.
6. Follow-up.

Result of project

The main result of this project is the matchmaking methodology developed and tested in the project. The testing of this matchmaking methodology resulted in 22 Swedish firms and 78 Canadian firms engaging in business negotiations. Out of these had 8 Swedish firms and 10 Canadian firms concluded some kind of agreement, most of them licence agreements. The amount of agreements concluded are somewhat uncertain as some firms were unwilling to reveal such information. By far, most agreements and business negotiations concerned the environment and energy sector. The final report explains the significantly lower participation from the Swedish firms with a general lack of resources in the Swedish science parks and no public funding and interest for Swedish SME's internationalisation. Generally the Canadian authorities showed a larger interest in and supported SME's internationalisation than the Swedish authorities. The relative success of the energy and environment is probably best explained by the project leader's enthusiasm for the project, an enthusiasm that the category of firm he was mainly responsible for, energy and environment firms, gained most from.

Apart from these results the project has also generated some spin-off effects. 1) A new matching project, called E+project, concerning environmental firms in six specific regions in six different countries (Finland, Sweden, France, Italy, Canada and Australia) has started in December 1999. The project is co-ordinated by a Finnish technology park and has received EU funding. The project has a similar approach as the Sweden-Canada project. 2) The Innovation Relay Center (IRC) in Central Sweden has started a special database for energy- and environment firms in order to be able to help these firms with match making in 60 European regions. 3) The Swedish Delegation for Sustainable Development together with the Atlantic Canada Opportunities Agency have started market research to investigate the need for environmental technology firms to find foreign partners and customers.

Discussion and conclusions

In this part of the report we will discuss some patterns that have emerged from the three parts of the investigation: the park survey, the firm survey and the cases. From the discussion we will draw some conclusions where we feel science parks and other supporting organisations may have reason to reflect and perhaps take actions in the future. We will organise the discussion and the conclusions in six themes:

- Intent of internationalisation

- Supply and demand of internationalisation services
- Countries
- Internationalisation projects
- Internet
- Resources for internationalisation

Intent of internationalisation

While most parks have acknowledged the value and importance of internationalisation and services/activities in this field, few parks have any vision, strategy and/or plan of how to work with this issue in a more systematic fashion. Our firm survey has shown that some 58% of the firms have strong intent to internationalise their business and that 47% find it important or very important that internationalisation services are available in or through the park. 40-50% of the firms (depending on if these services were free of charge or not) would move the internationalisation issue higher up on the agenda if they were given easy access to relevant internationalisation services.

The rationale for this intention is not very surprising. The firms view their home market as too small and that they need to access important knowledge and technology developed abroad. For many firms internationalisation comes natural as this is built into their business idea.

Our conclusion is that there is a strong need for advice, services and leadership on this issue among the firms and that the park management and other supporting organisations need to pay more attention to internationalisation issues.

Supply and demand of internationalisation services

While most parks say they have some services or activities in this field surprisingly many firms assert their ignorance on this point. 52% of the firms do not know if the park offers any activity or service on internationalisation. The Icelandic and Finnish parks seem to be better at informing their firms than the Baltic, Danish, Norwegian, and Swedish parks.

Firms in general wish to receive as individual and tailor-made service as possible. However, forms with groups of firms with similar needs and interests and/or meeting firms with internationalisation experience also seem to be interesting to the park firms. More general forms of internationalisation activities like courses, written information etc seem to attract little interest among the firms. Many parks assert that they can provide some advice by their own business advisors or by a larger network connected to the science park. Because so few firms have used these services we question if the parks really provide the right kind of internationalisation competence to their firms. Few parks, except the Finnish parks, provide any activities for groups of firms. Some parks have organised groups of firms to attend larger international fairs or to visit other foreign science parks. In general these activities seem to be ad hoc and not activities in a systematic and continuous approach to internationalise the firms in the park.

Concerning the types of services perceived as useful by the firms, they first of all wish to get advice and help from business consultants with international experience and with a network of interesting contacts on foreign markets in order to “open doors” for the firms. Market research, financing of international competence development and matchmaking with foreign partners are also important services according to the firms. Few parks, except some Finnish parks and a Swedish park, provide “door openers” and international business consultants to their firms. Some parks report that they have such resources in networks linked to the park.

The most common service provided by the parks of the above mentioned is probably matchmaking with foreign partners. In Sweden many parks and firms have participated in the matchmaking project with Canadian high-tech firms. Many parks have mentioned the matchmaking services provided by IRC (Innovation Relay Centre). The problem here is the anonymity of IRC;. 82% of the firms did not know what IRC is and subsequently not what services they provide.

Another type of service is the international marketing of the whole science park in order to build an international reputation and to attract foreign firms to the park. From earlier research on science parks we are aware of the importance of the science park reputation for the firms. As so many firms have strong internationalisation intents it is not surprising that so many firms also want the science park they are located in to have an international reputation. 58% of the firms rated the international marketing of the science-park as important or very important and 45% wanted the park to actively recruit foreign firms. Not very many parks provide this service, especially the international marketing. On the other hand, to build a reputation, is a difficult and long-term task. This is not only in the hands of the science parks but is also dependent on what the firms do, the attention from media and so on. However, a prerequisite for an international reputation is of course that the park is internationalised in some sense. Many parks reported recruitment activities of selected foreign firms. However, many parks also had lack of office facilities that hindered further activities.

Regarding supply and demand of internationalisation services the following conclusions could be drawn:

- Firms do not know what kind of internationalisation service (if any) the park can provide and where to find it. This is especially pronounced in Denmark, Norway and Sweden. The parks need to inform their firms more and better about what the firms can expect in this area. Here Icelandic and Finnish parks can be role models.
- Firms wish to receive advice and help on an individual basis or groups of firms with similar needs and interests. Parks need to reflect on how they could expand their activities and competence to work in a more individual fashion with the firms.
- Firms want help and advice from experienced business consultants, especially consultants with international networks that could act as “door openers” for the firms. Market research, financing of international competence development and matchmaking with foreign partners are other important activities. Parks need to reflect on how they can provide the firms with access to such persons and networks. A “package” of all these services, i.e., door openers, international business consultants, market research, financing of international competence development and matchmaking, would of course be a highly valued service by the firms.
- Many parks provide and promote matchmaking with foreign partners through IRC. IRC is however virtually unknown by the firms. Make IRC and its services known to the firms.
- Many firms value international marketing of the park and recruitment of selected foreign firms to the park. Parks need to reflect on how they best, in co-operation with the firms, internationally market the park and which foreign firms to attract to the park.

Countries

Four “countries” are outstanding in interest for the firms: the other Nordic countries, USA, Germany and UK. The Baltic firms also find their neighbouring Baltic countries interesting. These countries are interesting as both markets and technology partners. It is important not to forget the importance of the other Nordic and Baltic countries. For many small firms it is natural and perceived with less risk to start internationalisation in one or several of the

countries nearby instead of on larger and far away markets. Surprisingly few parks have mentioned any activities concerning the neighbouring countries. The attention to the USA and the larger European countries seem however to be strong in the parks.

Other countries have received a significantly lower rating by the firms. France and Japan is in a second group of interest, Japan especially interesting as technology partner. For the Baltic countries Russia is an interesting country. A third group of countries is Canada, the Netherlands, Italy and Spain. A fourth group is China and Switzerland. It is worth mentioning that bilateral projects like China-Link (between China and Finland) and Swedepark's Canada-project (between Sweden and Canada) according to this survey should receive significantly lower interest from the science park firms compared to the third bilateral project described in this report, Global Software (between Finland and the US).

We conclude that the other Nordic and Baltic countries, USA, Germany and the UK should receive the majority of the internationalisation efforts. Especially the other Nordic and Baltic countries seem to be overlooked by the parks. Other countries are also of interest for the firms, however of more limited interest. Bilateral projects to these countries may require that several parks, several regions and/or several countries (making them multilateral) to co-operate in order to attract interest from a sufficiently large group of firms.

Projects of internationalisation

Even though a majority of the firms express intent and interest in internationalisation the complexity of the issue may seem overwhelming for the small firm. Everyday operations and problems also tend to occupy the small firm's management often resulting in neglect of strategic issues like internationalisation. In such situations "a package" of services offered during a limited time in the form of a project might be the solution. This package might consist of the most highly valued internationalisation services mentioned above: door openers, international business consultants, market research, financing of international competence development, and matchmaking. This is roughly the components of the Global Software and China-Link projects described earlier in the report. The project mode with a definite starting date and a definite closing date forces the firm's management to prioritise the project and to allocate time to the internationalisation issue.

To run such projects cost efficiently, several firms with similar internationalisation interests need to be organised into a group. This is also beneficial for the project as firms often learn from other firms' actions and reflections. To attract interest for such a project, to make sure that the project is available at a time suitable for the firm, and to be able to develop and change the project, the project needs to be run with continuity. In order to attract enough participating firms and to run the project regularly, i.e., once a year, even the largest science parks in the Nordic countries is not large enough. Thus, the area from where firms are recruited must be expanded either to include several science parks, one or several regions, one or several countries or some combination of all of these.

In order to secure the project's continuity and development the project needs a fiery spirit or someone with a commercial interest in the project. The Canada-project and the Global Software had both persons acting as fiery spirits and protector of the project. China-Link is developed and run by a consulting firm with commercial interests in the project. Thus, they have commercial incentives to expand and develop the project.

Given the importance of both the Nordic and Baltic countries for the firms projects involving these countries could be of great interest for the park firms. We suggest that the Nordic science park network and/or the individual Nordic science park associations (Swedepark, FIN, TEKEL and FFP) initiate formal co-operation with the Baltic science park network (BASTIC) in order to find out if joint projects in the internationalisation area could be of interest.

We conclude that internationalisation projects might be an effective way to assist smaller firms' internationalisation. Such projects should be organised for a group of firms and offered regularly. Thus, science park representatives need to discuss how they can co-operate and develop joint projects between parks, regions or countries.

Internet and other information sources

The most important external sources of information about international markets and international technical development are customers, the Internet, and fairs and conferences. That customers are the prime information source is hardly surprising. That the Internet is such highly valued information source is however more surprising. All Nordic and Baltic science parks have home pages, but the quality varies significantly. For instance, not all science parks have home pages in the English language or provide a list of firms in the park. If the Internet is an important information source for science park firms, all science parks need to at least have information in English, have updated information about all the firms and links to the firm's home pages. Science parks also need to remind the firms about the importance of keeping the pages updated and informative.

Universities are also rated as an important information source, especially regarding international technical development. Here science parks seem to provide good services as most parks mention having good relations with the nearby university that are accessible to the firms. Surprisingly low rating has been given to institutions like Chamber of commerce, embassies, and technical attaches. Perhaps, science park firms have limited experience from these institutions and/or do not know how to contact them and thus tend to underestimate the value of these sources. Our guess is that these institutions are perceived by the small firm to be mostly oriented towards larger firms' needs.

In conclusion we think there is a need for most science parks and their firms to review their home pages in order for them to function as a good external information source for other firms and organisations. A minimum should be to have home pages in English and to have an accurate list of firms in the park with links to the firms' home pages. Science parks also need to reflect over the possibility to make the services of organisations like Chamber of Commerce, export agencies, technical attaches, embassies and the like more visible and easy to access for the firms.

Resources for internationalisation

From the park survey it is evident that Finnish parks in general have a better resource situation than the rest of the countries' parks. The capacity to give business advice and to run internationalisation projects is significantly higher in Finland than in the other surveyed countries. Without knowing the full reason for this, we have observed that the Finnish parks in general seem to have much better support from local, regional as well as national authorities. This support also gives easier access to EU-funds, as EU-funds often demand that the individual country also makes a monetary commitment to the project in question. The difference between Finland and the other countries may also in part depend on the organisation between national authorities, regional and local authorities and the science parks.

The relations between the Finnish science parks, regional organisations like Centres of Technical Expertise and national authorities seem to be very well developed.

Successful internationalisation is not only a question of sufficient resources for the park or other supporting organisations. Also the firm engaging in internationalisation need to have sufficient resources. The projects of Global Software and China-Link stress among other things that the firm needs qualified managers that are prepared to invest a substantial amount of time in this project. Thus, it seems necessary to be somewhat selective when offering substantial internationalisation services to the firms.

In conclusion, we would suggest that the countries' authorities who are assigned to support the development of small- and medium-sized firms, make a closer study of the Finnish example and evaluate if this is an interesting way to support technology-based firms' internationalisation in science parks as well as outside science parks. We also think it is important for the success of projects where substantial internationalisation support are given to the individual firms, that the firm has appropriate resources to handle such support, most importantly a management that is able and willing to allocate their time and enthusiasm for the task.

Exhibit 1



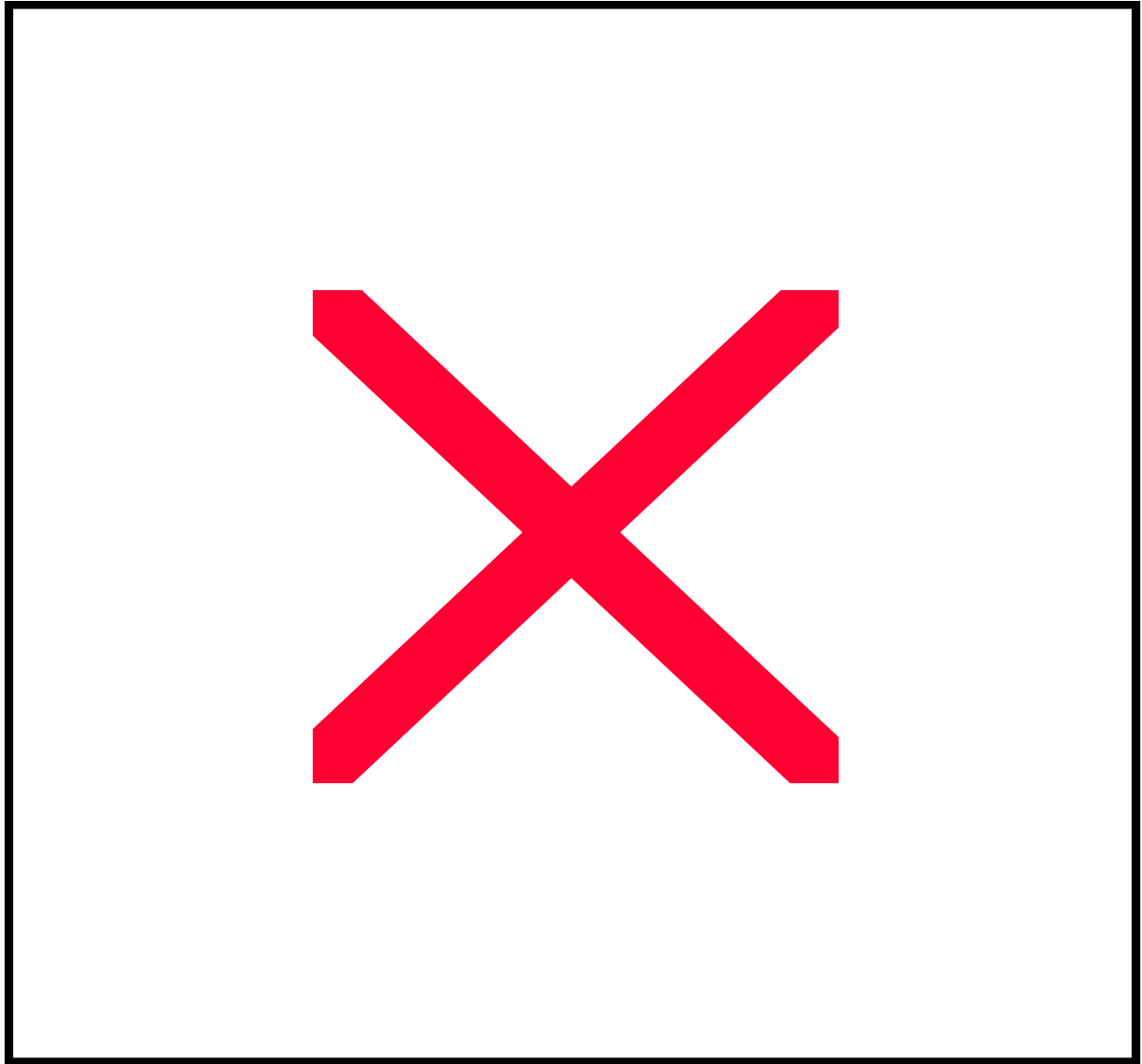


Exhibit 2

Questionnaire to the firms (only questions shown here)

Questions

- In which country is the company located?
- In which science park is the company located?
- Turnover of the company in MUS\$
- Number of employees
- Has the turnover increased by more than 25% annually in the last three years?
- How much of the turnover refers to exports?
- Number of years the company has been established
- In what industry is the company active?
- Is the company part of a larger concern with more than 500 employees?
- Are there foreign owners to the company?
- Does the company co-operate regularly regarding research/technology-product development with (multiple answers allowed)
- Does the company have foreign establishments regarding (multiple answers allowed)
- How strong are the ambitions to internationalise the company's activities? (1=no ambitions, 5=very strong ambitions)
- What are the reasons for internationalising your company? (two answers allowed)
- What are the reasons for not internationalising your company? (two answers allowed)
- Which functions within the company will probably be affected by an internationalisation?
(two answers allowed)
- Which external sources of information regarding international conditions are the most important for the firm when it comes to international market contacts and marketing? (five answers allowed)
- Which external sources of information regarding international conditions are the most important for the firm when it comes to international technology development? (five answers allowed)
- If the science park supplied internationalisation advice, how would you like to receive this advice? (two answers allowed)
- Which internationalisation services would your company preferably like to find in the science park? (five answers allowed)
- How important is it that the science park recruit internationally active companies to the science park? (1=not important, 5=very important)
- Which countries are the most important for the company concerning sales? (five answers allowed)
- Which countries are the most important for the company concerning research-technology development? (five answers allowed)
- Does your science park (or associated organisations) supply service and advice regarding internationalisation issues?
- If yes, have you used any of those services?
- If yes, are you satisfied with the service and advice that you received? (1=not satisfied, 5=very satisfied)

- How important is it that your science park can supply service and advice regarding internationalisation issues? (1=not important, 5=very important)
- How important is it that your science park is made internationally known? (1=not important, 5=very important)
- Would you be more inclined to internationalise your company if the desired services were available in the science park?
- Would you be more inclined to internationalise your company if the desired services were available in the science park and free of charge?
- Have you heard about EU's IRC (Innovation Relay Centre) and the services they are providing?
- Additional comments:

Exhibit 3

