

## 6. PAPER ONE: SEED FUNDING FOR INNOVATIVE VENTURES: A SURVEY OF PUBLIC FINANCE

### ABSTRACT

The purpose of this paper is to describe and analyse the mechanisms by which innovative new ventures receive publicly funded financial support. It suggests that 'soft' and informal small-scale financing provided to new firms and idea owners are important in encouraging entrepreneurs in the start-up process, especially in gaining additional financing for the business. As governments provide increased public sector funding to assist entrepreneurial activity, it is important to understand and analyse the key factors that have influenced the rationale in supporting new businesses. The study has used quantitative methods, e.g. statistical analysis, using SPSS. The results presented are drawn from a Swedish database containing 5839 applications for public soft loans during a period of almost ten years. The database is created from a dataset provided by Sweden Innovation Centre (SIC) covering the years 1994 to 2003. The analysis shows, first, that specific variables such as legal form and industry strongly affect the decision by which governments provide funding to new businesses, and second, that both expressed and tacit selection criteria have affected the process that determines which ideas gain support.

### INTRODUCTION

Many European countries are pursuing policies to increase the number of individuals interested in starting out new ventures and the quality of these ventures (Storey and Tether, 1998a; Bennett and Robson, 2003). In order to stimulate such developments, most European countries use various forms of financial support tools (Lindholm-Dahlstrand and Cetindamar, 2000; North et al., 2001) including seed capital (which is used in the earliest stages of venture development) and public sector sourced financial support (which is usually supplied on a non-equity basis). This small-scale provision (up to k€ 45) to new ventures can include direct financial support in the form of soft loans and subsidies, as well as indirect support mechanisms such as entrepreneurship training and incubator development (Klofsten et al., 1999; Oakey, 2003).

According to studies such as Klofsten et al (1999) and Lerner (2002), firms in receipt of grant-funded financial support often increase their credibility in attracting further complementary financing from other sources. In addition, small amounts of money provided to new ventures in the first phase of development can be important in motivating business growth, as this funding is often perceived by the entrepreneur as proof that a third party has evaluated the idea and supported its development. Even

relatively small sums, such as innovation subsidies of up to k€ 5, have been demonstrated to be important to the continued expansion of entrepreneurial projects (Klofsten et al., 1999).

Whilst some academics have warned that the public financing of new ventures has had very limited success (Storey, 1994; Cressy and Olofsson, 1997; Bergström, 2000;), others such as Lindholm-Dahlstrand and Cetindamar (2000), McGlue (2002) and Oakey (2003) have claimed that public sector capital can be employed as ‘pump priming’ funding to trigger further private sector investment. For example, two recent studies (Karaomerlioglu and Jacobsson, 2000; Kutsuna, 2002) have examined the relationship between public and private financing, and have found that public funding is important in situations where there is high risk combined with a lack of tangible assets.

With the exception of Klofsten et al. (1999), there has been relatively little research specifically examining public sector early-stage financing of innovative businesses. For example, contributions such as Lawton (2002), Lerner (2002), Lindholm-Dahlstrand and Cetindamar (2000), North et al. (2001), Oakey (2003) and Storey and Tether (1998b) have examined public early stage finance as only one of a variety of forms of finance to new ventures.

An examination of public-sector support of new innovative ventures is important, especially if, as Storey (1994) suggests, publicly funded financial systems for new business have been shown to be largely ineffective. It is therefore imperative to evaluate and learn lessons from the management of such schemes, especially in planning future financial systems that can support the development of new firms. Drawing on a unique ten-year dataset from Sweden Innovation Centre (SIC), a publicly funded scheme used in Sweden, this quantitative study will examine the basis by which firms and idea owners receive early stage public support and will provide an insight as to how the public sector acts and select their projects for support. In particular, the paper will focus on selection criteria that have been used and the important factors influencing the funding decision.

The support system studied by this research is non-equity based and aimed at new ventures and projects that are intellectually or technologically-advanced. The firms and idea owners in receipt of the funding in this study can generally be described as new technology-based firms. As previous studies have demonstrated (Westhead and Storey, 1997; Lindström and Olofsson, 2001), innovative firms are often associated with high risks but, if successful, will achieve high growth rates. Furthermore, these firms are often spin-offs that are based on ideas generated from either universities or research-intensive companies (Meyer, 2003) and, as such, their technological focus implies that any products, processes or services will need a relative long period of development

from idea to market. This, in turn, entails an increased likelihood of financial obstacles at start-up, especially when new products and services for new markets are being developed (Lindström and Olofsson, 2001). These obstacles are usually reinforced by the fact that equity investors such as venture capitalists are reluctant to make investments where there is ambiguity over an exit strategy and little prospect of getting return on the capital invested (Bygrave and Timmons, 1992) and, instead, tend to favour companies that have products or services that are close to market launch (Oakey, 2003). Furthermore, venture capital investments in early phase ventures are associated with various obstacles, especially with respect to investment costs (Mason and Harrison, 2004). For example, if the costs of the investment, due diligence and other fixed costs are too high as compared to the size of the investment, then there is an increased risk for potential investors (Harding, 2002). As a result of such concerns, venture capitalists and informal investors - such as business angels - are often reluctant to provide funding for many early stages innovative firms.

Therefore, when it comes to the acquisition of resources, the demand and supply of financial resources are often in disequilibria. This finding is not new - the Macmillan report (1931) reported this phenomenon as a 'financial gap' for business - and more recent research has emphasised other types of 'market failures' such as information asymmetries, knowledge gaps and under-investments in R&D (Storey, 1994; Storey and Tether, 1998a; Martin and Scott, 2000; Harding, 2002; Lerner, 2002; Carpenter and Petersen, 2002).

To date, the literature examining financial gaps (Harding, 2000; North et al., 2001; McGlue, 2002; Mason and Harrison, 2003) has concentrated on the supply of venture capital when the business is more established which is different to the small scale financing addressed in this paper. Indeed, finance in the earliest stages of a venture's development is crucial for survival, and here there is a need for greater examination of the important finance gaps that can exist in the earliest stages of the life of a business. If the new innovative venture is unable to survive its first stages of development, the issue of addressing future financial gaps when the business is established may not even arise.

Another perspective to be examined in this paper is the supposition by many investors that whilst there is capital available in funding the new venture, the lack of suitable projects remains the key problem (Harding, 2000; Mason and Harrison, 2001; McGlue, 2002). One possible explanation of this phenomenon is that independence is a common reason behind starting out a venture (Lindholm-Dahlstrand, 2004), and many entrepreneurs are consequently averse to external ownership and reject any proposed equity-based venture capital investments (Harding, 2000, 2002; Berggren et al., 2000; Mason and Harrison, 2001).

Furthermore, venture capital is clearly not the solution for all new ventures as only a very small minority of new knowledge-based firms seeks such funding (North et al., 2001). For example, under-capitalization has been put forward as a winning entrepreneurial strategy with the arguments that lack of capital prevents large overheads and diversified ownership of the venture (Goldstein, 1984). In addition, too much capital can also make the venture drop its focus on its customers and market and instead focus only on the process of obtaining funds (Lerner, 2002). This phenomenon was demonstrated during the recent collapse of the stock exchange, where a number of dot.com companies - despite an enormous supply of venture capital - did not survive and went out of business. Therefore, whilst survival that is based on the ventures internally generated profits might not create the most rapid growth rates, it is still a viable strategy for sustainable and controlled growth in the early stages of development (Goldstein, 1984).

The 'soft' finance from SIC, studied in this paper, has been provided free of any interference with the ownership of the business which means, in contrast to traditional equity-based venture capital, it has not impeded the independence of the entrepreneur. Mason and Harrison (2001; 2002) have discussed the importance of ensuring ventures are 'investment ready', and the requirement that entrepreneurs, at the earliest stage of development, increase their awareness of the various forms of external financing. Indeed, every effort to obtain external resources challenges the management of the venture to develop business plans in order to convince investors and 'practice makes it perfect'.

Hence, this kind of small-scale public-sector supplied financing for entrepreneurs and innovators at the earliest phase of development of the venture can be essential, not least as an instrument to ensure that new ventures address the potential for external financing. As a recent study has shown, availability of finance is key to the development of new innovative businesses (Kaulio, 2003). Another important aspect is that the development of bids for public sector funding can help ventures, even in the very earliest development stages, to prepare for the various evaluation criteria that may be applied more stringently in any future private investment situation.

## **SWEDEN INNOVATION CENTRE (SIC)**

Founded in 1994, the SIC "supports innovators in their absolute earliest phases of development – with financial capital, advice and networks. One of the objectives of SIC's work is to create a better innovation climate in Sweden – a climate where people's attitudes to innovators is positive. And where it is easy for an innovator to receive help to develop his or her concept to a commercialised product or service" (SIC 2002, page 24).

At its inception, the SIC established funds of M€ 56.7 received from the public foundations of employees to help support new innovative projects. The project was to last ten years and all funding was to be, and has been, allocated during this time. During the last decade, there have been three types of financial support directed towards idea owners from the SIC:

- Innovation subsidy, namely a financial grant of approximately k€ 4 with no obligations of payback from the recipient business.
- Conditional loan, a ‘soft’ type of loan (maximum k€ 43) that had its security only in the specific project receiving backing. If the project turned out well, the venture got five years to pay the loan back, and if the project failed commercially, the loan was written off.
- Scholarship was used for special issues.

The support from SIC was given both to firms and private individuals. The funding was restricted and a project had to fulfil the following conditions: it had to be a new project or innovation, the project or innovation had to be able to commercialise and the project or innovation had to be technically or intellectually advanced. The administration of the applications was conducted by SIC and by authorized external actors such as regional innovation centres, NUTEK, the judgement group of Swedepark and consultants with expert knowledge of different industries. (SIC; SIC 2002; SIC 2004 and interviews)

## DATA AND METHOD

This paper presents the results of a quantitative study of the public financing of innovation projects in Sweden. The analysis is drawn from an SPSS-database, created from a dataset provided by SIC which contained 5839 applications (from October 1994 to September 2003). The material received from SIC has then been revised, elaborated, classified and refined by the authors to make statistical analysis possible.

The tools for the analysis used have been limited to cross tabs and comparisons of means. To detect significances in the data material and to see patterns between variables, chi-square test has been used. ANOVA and ANOVA with Bonferroni tests has been used for comparison of means to analyse the amounts of money applied for, and received by, the innovative ventures. The database has a number of general variables, including date of project, geographical location, year of birth, sex of applicant, legal form of firm, type of industry, reason to rejection and administrative official. It also has another thirteen variables for the application (e.g. using areas for the money applied), including Technical pre-study, Commercial pre-study, Swedish patent, Patent Corporation Treaty (PCT), Protection of design and trademark, Construction,

Design, Prototype, CE-mark and tests, Test series of production, Negotiation costs, Initial commercialisation activities and a last 'Unspecified actions' for catching up.

The database has got falling off, mostly of a partial character, which due to the size of the material has been assessed to have low impact. A Systematic falling off exists from the start in 1994 to May 1999 in cases where application is supported. The reason to the falling off is the initial administrative routines. Applied amounts only have been registered in cases not supported and only as total amounts, without specification on using areas. From May 1999, new routines for registration were introduced. In order to be able to compare applied cases with supported cases we have chosen to analyse a selection. The selection, named '*a-selection*', is the applications with available applied amount, totally 3017 cases. Comments are made where the a-selection is used.

This paper will investigate Conditional loans only and has dispensed with the Scholarships, though they are very heterogeneous as group and only temporarily used, and the Innovation subsidies since the material is very large, approximately 30000 applications, and split upon 21 separate registers.

## SAMPLE CHARACTERISTICS

During 1994 to 2003, SIC received a total of 5839 applications for conditional loans. 89% (5209) of the applications were sent in by males and 11% (630) by females. The average number of applications per year was 677 (first and last year excluded). The applications according to the variable legal form of the firm are as follows: sole proprietorship<sup>1</sup> 2465 cases, limited company 2577 cases, trading and limited partnership 469 cases, economic association 16 cases and missing information 311 cases.

During the last ten years, SIC has allocated its funding (dedicated to conditional loans) over thirteen different using area classifications, namely: Prototype and Construction (M€ 11 each), Initial commercialisation activities and Test series of production (M€ 7 each); Unspecified actions (M€ 5), PCT (M€ 4), Swedish patent and Negotiation costs (M€ 3 each), CE-mark, Design, Technical pre-study and Commercial pre-study (M€ 2 each) and Protection of design and trademark (M€ 1).

Whilst the industry variable originally included 65 different industry segments, for the purposes of this study it has been aggregated into new variables. Hence, the industrial structure of the recipients are as follows: Forestry and agriculture (413), Chemicals and metal (652), Computers and IT (612), Machinery (907), Equipment and instruments (1936), Energy and environment (52%) and a mixed 'Other' category (571).

The geographic location of the applicants is spread over the 21 counties of Sweden, but the applicants are most heavily concentrated to the most densely populated

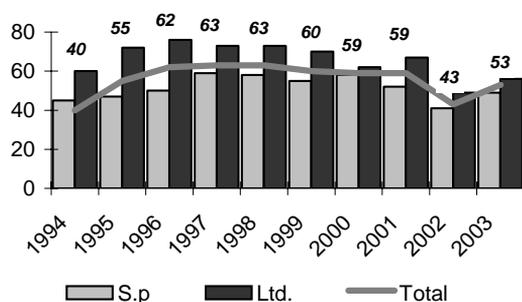
counties such as Stockholm (38%), Gothenburg (14%) and Malmö (8%). Remaining counties represents approximately 2% or less of the applications each ordered on a falling scale, topped by a couple of counties close to Stockholm and Gothenburg and ended with the Baltic sea island, Gotland, that represents 0,3% of the applications.

## RESULTS

### APPLICATIONS

The total average of supported cases is 57% of all applications. The highest support rate was 63% in 1997 and 1998 and the lowest was 43% in 2002 (see figure 1). The low rate for 2002 can be explained by the decline in the value of the stock exchange (as large parts of the SIC's foundation's funds were related to stock investments).

*Figure 1. Success-rate of applications (% , year).*



Abbreviations: 'Ltd.' -limited company, 'S.p.'-sole proprietorship, 'Total' -average support rate, all cases.

### INDUSTRY

The analysis of the data indicates that the industrial sector in which the business operates can directly affect the possibility of gaining support from the fund. As table 2 shows, there are significant differences in the success rates of applicants across different industries in obtaining funding, as well as in the amounts of funding received. In order to rank the industries, means have been compared by running ANOVA with Bonferroni test to detect if the differences in the funding applied for, and subsequently supported, are significant across the groups. When comparing the means of applied and supported amounts by industry types, computers and IT applicants have higher success rates and obtain higher amounts of funding than the other industries ( $p=0.000$ ). The ranking of the remaining industries is not obvious. Equipment and instruments and Energy and environment have applied for larger amounts than Chemicals and metal and vice versa, but there are no differences in case of supported amounts. The categories Machinery and Other are not significant smaller or larger than the rest.

### LEGAL FORM

With regard to applications, there are significant differences in the success rates of business by legal form (table 1). In all cases, the success rate for applicants with limited companies was higher than for applicants classed as sole proprietors. For nine out of thirteen areas, all figures are highly significant. The general pattern shows that limited companies applied for (and gained) higher amounts than sole proprietors. Note that the percentage figures for support presented in table 1 are lower than the general percentage figures for support. This due to the detail of the statistics i.e. it is possible for an applicant to be rejected for support in one area but to obtain funding in others. Therefore, partially rejected applications are not considered for the average support rates and if there is one supported application by a firm, the application in total is judged to be supported.

When analysis was run on the variables legal form and industry, larger differences appeared (see table 2). Applicants with limited companies have shown higher success rates than applicants with sole proprietorship ( $p=0.000$ ) and for all industries (with the exception of Forestry and agriculture and Machinery), the success rates for limited companies are higher. ANOVA with Bonferroni test was run in order to detect if the differences between limited companies and sole proprietors by industry was significant. Significant differences for the amounts applied for, due to legal form, were found for the industries Forestry and agriculture, Chemicals and metal, Machinery, Equipment and instruments and for the last category - Other. For supported applications, there are significant differences for the industries Forestry and agriculture, Machinery, Equipment and instruments and Other. In all cases, applicants with limited companies status have both applied for, and received higher levels of support, than sole proprietors.

There are also differences due to gender on the variable legal form of firm. More females have applied as sole proprietors for funding rather than as representatives of limited companies. 39% (2059) of the males have applied as sole proprietors compared to 64% (406) of the females, whilst 46% (2420) males have applied as limited companies, compared to 25% (157) of the females. However, women have a higher success rate in gaining support, and 77% of the applications from females from limited companies gained support as compared to 65% for the males. The difference due to gender (according to the legal form of the firm) is significant by the chi-square test ( $p=0.002$ ) for limited companies. In absolute terms, the figures for sole proprietorship and for limited partnerships are also higher for females, although the differences between males and females are not significant.

Table 1. *Legal form and using area*

	Appl. selection	Appl. Ltd.	Appl. S.p.	Sign. Level applications	Sup. Ltd.	Sup. S.p.	% Sup. Ltd.	% Sup. S.p.	Sign. Level support
<b>Technical pre-study</b>	344	203	141	chi2. p=0.005 anova. p=0.023	88	44	44%	31%	chi2.p=0.026
<b>Commercial pre-study</b>	460	255	205	chi2. p=0.001 anova. p=0.000	109	49	42%	24%	chi2. p=0.001 anova. p=0.000
<b>Swedish patent</b>	778	362	416	chi2. p=0.007 anova. p=0.003	191	177	53%	42%	chi2. p=0.002 anova. p=0.000
<b>Patent Corporation Treaty (PCT)</b>	960	421	539	chi2. p=0.009 anova. p=0.001	192	200	46%	37%	chi2. p=0.045 anova. p=0.002
<b>Protection of design and trademark</b>	674	321	353	-	139	125	43%	35%	chi2. p=0.036
<b>Construction</b>	1099	644	455	chi2. p=0.000 anova. p=0.000	327	156	51%	34%	chi2. p=0.000 anova. p=0.000
<b>Design</b>	725	385	340	chi2. p=0.000	175	100	45%	42%	chi2. p=0.002
<b>Prototype</b>	1068	576	492	chi2. p=0.000 anova. p=0.000	280	174	49%	35%	chi2. p=0.000 anova. p=0.000
<b>CE-mark and tests</b>	848	482	366	chi2. p=0.000 anova. p=0.000	211	117	44%	32%	chi2. p=0.000 anova. p=0.000
<b>Test series of production</b>	936	450	486	chi2. p=0.000 anova. p=0.000	186	187	41%	38%	chi2. p=0.000 anova. p=0.000
<b>Negotiation costs</b>	1055	538	517	chi2. p=0.000 anova. p=0.000	231	183	43%	35%	chi2. p=0.004 anova. p=0.000
<b>Initial commercialisation activities</b>	1431	704	727	chi2. p=0.000 anova. p=0.000	330	299	47%	40%	chi2. p=0.000 anova. p=0.000
<b>Unspecified actions</b>	302	146	156	-	63	47	43%	30%	anova. p=0.004

Abbreviations: 'Appl' – application, 'Ltd.' –limited company, 'S.p.'-sole proprietorship, 'Sup' – support and 'Sign' – significant.

Table 2, Type of industry and legal form

	Applied Number of cases 2663		Supported Number of cases 1486	
	Limited companies	Sole Proprietors	Limited companies	Sole Proprietors
<b>Forestry and agriculture</b>	Cases: 56 Mean: k€ 29* (L)** ( <i>p</i> =0,000)	Cases: 90 Mean: k€ 19 (S) ( <i>p</i> =0,000)	Cases: 26 Mean: k€ 24,6 (L) ( <i>p</i> =0,035) Hit-rate*** 46%	Cases: 47 Mean: k€ 13,7 (S) ( <i>p</i> =0,035) Hit-rate 52%
<b>Chemicals and metal</b>	Cases: 146 Mean: k€ 29 (L) ( <i>p</i> =0,000)	Cases: 185 Mean: k€ 19 (S) ( <i>p</i> =0,000)	Cases: 93 Mean: k€ 17,2 Hit-rate 64%	Cases: 100 Mean: k€ 11,7 Hit-rate 54%
<b>Computers and IT</b>	Cases: 287 Mean: k€ 36	Cases: 87 Mean: k€ 29	Cases: 196 Mean: k€ 25 Hit-rate 68%	Cases: 34 Mean: k€ 18 Hit-rate 39%
<b>Machinery</b>	Cases: 168 Mean: k€ 31 (L) ( <i>p</i> =0,000)	Cases: 176 Mean: k€ 22 (S) ( <i>p</i> =0,000)	Cases: 91 Mean: k€ 23 (L) ( <i>p</i> =0,000) Hit-rate 54%	Cases: 99 Mean: k€ 14 (S) ( <i>p</i> =0,000) Hit-rate 56%
<b>Equipment and instruments</b>	Cases: 475 Mean: k€ 34 (L) ( <i>p</i> =0,000)	Cases: 446 Mean: k€ 21 (S) ( <i>p</i> =0,000)	Cases: 284 Mean: k€ 24 (L) ( <i>p</i> =0,000) Hit-rate 60%	Cases: 256 Mean: k€ 13 (S) ( <i>p</i> =0,000) Hit-rate 57%
<b>Energy and environment</b>	Cases: 136 Mean: k€ 31	Cases: 149 Mean: k€ 26	Cases: 73 Mean: k€ 22 Hit-rate 54%	Cases: 56 Mean: k€ 15 Hit-rate 38%
<b>Other</b>	Cases: 101 Mean: k€ 31 (L) ( <i>p</i> =0,008)	Cases: 161 Mean: k€ 22 (S) ( <i>p</i> =0,008)	Cases: 55 Mean: k€ 22 (L) ( <i>p</i> =0,001) Hit-rate 54%	Cases: 76 Mean: k€ 13 (S) ( <i>p</i> =0,001) Hit-rate 47%

A-selection is used; cases with other legal form than limited company and sole proprietorship are excluded.

\* € 1 = SEK 9,03 /Dagens Nyheter 2004-11-12

\*\* Abbreviations: (L) – Larger, (S) – Smaller (than the other category)

\*\*\* Hit-rates are calculated in percent of number of applied in the group and in the selection of 2663 cases. The hit-rate for all 2663 cases is 56%.

## DISCUSSION

As Landström, (2003) has demonstrated, there was relatively good access to funding for new ventures in the late nineties in Sweden, especially for businesses at the earliest stage of funding. Therefore, finance was not a major problem for innovative new firms, mainly because of a growing venture capital industry investing in early stage funding (SVCA, 2000) and the presence of public actors such as the Sweden Innovation Centre (SIC), which offered conditional loans and subsidies to new firms and idea owners. In addition, there were a range of other actors providing both seed and growth capital, such as ALMI, NUTEK and Industrifonden.

However, the situation in Sweden is different today and shows a venture capital market that is reducing its investments in seed and start-up phases (NUTEK, 2002; SVCA, 2003; SVCA, 2004). Indeed, both the number of investments and the amounts

invested in new ventures by the private sector has declined significantly during recent years. It is also clear that public funding to support investment in new ventures is decreasing and this situation has led to a growing debate about the future financial system to support innovative new firms. In a recent Swedish report (Neergaard, 2004), it has been suggested that a more integrated system of actors and funds within an innovation system should be considered and a new public financial system for new ventures is under development. Hence, the issues of public financial support directed towards the earliest stages of development within innovative firms are more important than ever.

The results show that a number of variables are significant among the applications supported or rejected. The strongest ones are the legal form of the firm and the type of industry. Furthermore, we will discuss the high rates of support and some deviations according to gender and geographical location.

### **THE LEGAL FORM OF THE FIRM**

There are many factors that influence growth in new ventures, most of which are directly related to characteristics of the entrepreneur, the venture and its strategy. The legal form of the firm has been put forward as one of the most important variables in several studies, along with factors as the market, location and size (Storey, 1994; Davidsson et al., 2002). For example, Almus and Nerlinger (1999) have indicated that firms with a limited liability status have a higher growth rate than other legal forms of business.

This study supports such a finding and shows that the legal form of the firms is important in obtaining innovation support. In general, strong significant differences are shown due to legal form and in almost every case, applicants with limited companies apply for (and receive) larger amounts of funds than sole proprietors and partnerships. In the context of these findings, it may be interesting to consider whether entrepreneurs that are growth-oriented start limited companies to achieve their goals faster, especially as establishing a limited company in Sweden requires an initial capital investment of k€ 10.7 from the owner/s of the firm, which suggests that they may be more committed to the success of the business.

In order to find out if the legal form of the venture had acted as a hidden selection criterion, the question of the influence of legal form on the decisions was addressed directly to SIC<sup>2</sup>. They responded by stating that the application was considered mainly in terms of its quality and commercial potential, and not because of the legal form of the firm. SIC did admit that there often is a correlation between a well-developed application and the legal form of the applicant, mainly because of the advantage of limited liability status. When the same question was addressed to the judgement group of Swedepark, their<sup>3</sup> answer was similar although they stressed that limited companies

often have better applications due to better-developed business ideas. Another reason put forward by the judgement group is the backing from mentors within the park, as entrepreneurs are supported during their incubator process by the staff of the park (who often assists the judgement group with information for their decisions). The group also stresses that the quality of the applications in general is higher among the applications originated in the science and technology parks, preferably due to the close bounds between the actors. According to the director of the incubator of Västerås Technology Park<sup>4</sup>, the ventures in the incubator are recommended to run their business in limited companies instead of sole proprietorship, as a limited company status gives a more assurance to both customers and investors. Furthermore, they assert the limited liability as more protective for the owner.

If government seed capital is to be seen as a catalyst towards additional financing (Klofsten et al., 1999; Lerner, 2002) and if the legal form of the business is an important growth factor, this study supports the argument of Storey (1994), namely that limited liability status is better than other forms of ownership. In particular, a legal form with limited liability seems to give the owner trustworthiness against other actors, including the funding body SIC. Despite the statements from the interviews, the results of the study suggest that the legal form of the firm has acted as an underlying or tacit selection criterion in determining which type of ventures receive public support.

### **THE INDUSTRY**

Various studies have shown that the industrial sector in which the venture operates is one of the important variables for growth (Almus and Nerlinger, 1999; Davidsson et al., 2002). However, the main problem in identifying the importance of industrial sectors is that of classification (Davidsson et al., 2002) due to a blurring of different business activities and variations in industry definition. In the database used in this study, 80% of the cases are defined as manufacturing in different sectors, which gives a problem in comparison with services due to the fact that the groups are warped and some are too small to undertake appropriate analysis. Therefore, the research has focused on examining broad sectored classifications irrespective of manufacturing or service activities i.e. examine whether business ideas in instruments or computers receive more support than those in machinery or pulp.

Since the original variable industry used by SIC was divided into more than sixty groups, this paper has undertaken a broader clustering in order to achieve a more workable model. As shown earlier, the analysis shows that there are differences due to the type of broad industrial classification adopted. The industries Chemicals and metal, Computers and IT, Machinery, Equipment and instruments and Energy and environment, have gained higher rates of support than the other industries, and strong significances are shown due to the legal form. When analysis was run on less

aggregated levels, it appeared that limited companies had very high success rates in the most successful industries. This finding is not too surprising, as Davidsson et al (2002) have shown that the importance for a business of being in a growth industry. Indeed, the most successful industries in gaining support in this study are connected to areas such as information technology, and medicine and medical equipment, both of which have been associated with growth during the last decade (Karaomerlioglu and Jacobsson, 2000; Lerner, 2002; SVCA, 2003).

The study did not ask SIC and other actors whether their decisions had been affected by the type of industry, as mentioned, SIC has used twenty-eight freestanding consultants with expert knowledge on different industries for administration of the applications.

### **THE GEOGRAPHICAL LOCATION**

The differences in geographical location can be linked to several possible explanations. One is how the innovation support from SIC has been marketed. For example, the marketing activities among the regional innovation centres have varied with some regions being more active than others. Another explanation may be due to the location of certain actors supporting the scheme - the head offices of both SIC and its 'collaborator organisation' ALMI are located in Stockholm. Another example is given by one of the authorised administration partners of SIC, the judgement group of Swedepark, which has marketed the support system to Science and Technology parks in Sweden. The group has been working together with the staff of the local parks and the number of applications varies according to their relationships with these parks. The group's closest bonds have been with parks that are located to larger cities with larger universities. The judgement group<sup>5</sup> also explained high technology and innovation as 'a bit of an urban phenomenon'.

### **THE GENDER VARIABLE**

Some differences were found due to gender, especially in terms of the number of applicants and the choice of the legal form of firm. The number of applying females is approximately one out of ten. Furthermore, females tend to be sole proprietors when applying as compared to males, who apply largely as limited companies. However, there is no evidence that there is any discrimination against women while applying for funding and females have been very successful with their applications. The differences seems to be structural and if any efforts are to be made regarding gender, the most important action must be to encourage more females to develop their ideas and start out new ventures, especially as limited companies (Norrman, 2004).

### THE SUPPORT SYSTEM

As has been demonstrated, there is a high rate of support of ideas for funding and the most possible explanation of this probably lies in the nature of the support system itself. The process normally first starts for the firm or idea owner through contact with SIC or one of the Regional Innovation Centres. This leads to approximately 20% (4000)<sup>6</sup> applying for innovation subsidy as a first step and around 3.5% (700) applying for a conditional loan. Of those, 57% gained support, which is a high rate, although if the whole process is taken into consideration, it is a relatively small number of the applicants that receive funding. This is comparable to other sources of financing such as venture capital, which invest in between one and four per cent of all offers received (Fredriksen, 1997). However, it must be emphasized that public seed funding and venture capital are two different entities that are used in different phases of the development of the business for different purposes, and high or low success rates depends on a variety of different factors and how they are compared.

It is also worth noting that in order to gain support; the applicant must fulfil a number of pre-qualification criteria. Theoretically, a project that did not fulfil those conditions could scarcely complete the application and would not be considered for funding or may not even apply. As such, the application form itself can act as a selection tool in determining which projects are funded as the project must be new, must be able to commercialise and be technically or intellectually advanced. It was also specified which items were supported and which were not. The using areas, presented in the analysis, also told their language not least of technological height.

Taking a higher risk with investments is a part of the policy of the funding process, according to the managing director of SIC and the judgement group of Swedepark<sup>7</sup>. Both stated that the money lent by SIC is to be considered as seed finance and that the funds are supposed to take higher risks than normal banks. The initial policy of SIC, at least during the first years, was that the benefit of the doubt should always be given to the applicants. This policy emanates from the original purpose of SIC which was to create a better innovation climate in Sweden. Nevertheless, this approach was revised during the latest years of recession. Among researchers there has also been critical voices arisen about 'throwing easy money' on poor projects (Cressy and Olofsson, 1997; Åstebro, 2003), hence, it is important to examine this in more detail in further research i.e. to find out the boundaries between 'throwing money' and giving funds to develop innovative projects.

Taken together there have been several factors and selection criteria and several selectors, both tacit and expressed, affecting the process regarding the ideas that have gained support. Since the database only gives figures, it is important to continue with qualitative research on this issue in order to obtain a wider understanding of the funding process, both from a supply and from a demand perspective.

## CONCLUSIONS AND IMPLICATIONS FOR FUTURE RESEARCH

The aim of this paper was to describe and analyse the basis by which projects obtain public innovation support from a supply side perspective. The conclusions have been drawn from statistical analysis of a database created from the computerised diary system of SIC. From the analysis, the following points are worth highlighting:

- The 'legal form of the firm' is the most important factor to gain support.
- The variable 'type of industry' is important.
- Both expressed and tacit selection criteria have affected the process that determines which ideas gain support.

Regarding the legal form of the firm, the analysis shows that applicants with limited companies both apply for (and are supported with) higher amounts than applicants who are sole proprietors. This supports other studies (Storey, 1994; Almus and Nerlinger, 1999; Davidsson et al., 2002) that have shown the importance of legal form. This has been supported also by the qualitative interviews undertaken with key actors, although neither SIC nor the judgement group of Swedepark have admitted that any attention have been paid to legal form of the firm in the administration process. However, both institutions indicated that applications from limited companies often have more mature business ideas. Therefore, the research indicates that a legal form with limited liability is important, not least, in terms of trustworthiness for the owner against other actors. But, whether the legal form of the business is actually a tacit or hidden selection criterion has to be investigated in other studies.

As far as this study can ascertain, ventures from industries that have been associated with growth have been allocated the highest rates of funding, which supports findings from previous research studies (Karaomerlioglu and Jacobsson, 2000; SVCA, 2003). The variable also seems to be strengthened by the variable 'legal form'. Even in this case limited companies had the advantage.

The study suggests that success rates of applicants have been high, especially in comparison to other sources of financing, although if the whole process of application is taken into account, the proportion of firms being given support is similar to other sources such as venture capitalists.

Many questions have been raised during this study. Among them are issues like:

- Do entrepreneurs or inventors that strive after rapid growth start limited companies to achieve their goals faster, or is it due to their choice of legal form that they gain support, dare to take higher risks and thereby achieve faster growth?

- It has been argued that public support systems for new ventures are ineffective in socio-economic terms? What can be learnt for the future from the past ten years of the SIC-project?
- Does type of industry affect the decisions to support or reject applications for support?
- What is the selection process for supporting new ventures, especially the detailed criteria for selection?
- Is the kind of support that has been given by SIC an important factor in motivating those who have gained support? Does it play a role in making the ventures aware of external financing?
- Where is the border between '*throwing money*' on projects and investing in innovations that create wealth? On what side of this border has SIC been operating?

This study has provided rich background information and a base for several hypotheses. To achieve a genuine knowledge about public financing in early stages and to answer the above sample of questions, this study must be completed with qualitative studies on both the supply side and the demand side. It is therefore important to go on with qualitative studies of both applicants and representatives for the supply side. Among the group applicants it is important to survey both those that have gained support and those that have failed. With the former, it will be interesting to take a closer look at both the cases that have had success in their business and started to pay their loan back *and* with those that have gained support and failed with their projects. Also, to obtain gain knowledge on the entire SIC process, it is important to survey even the innovation subsidies.

This material has given us a quantitative description of what has happened during the ten year SIC project and the follow-up study will help provide answers as to the future direction and design of public innovation systems.

## ACKNOWLEDGEMENTS

The authors acknowledge the financial support of NUTEK and the Technology Bridge Foundation in Linköping, and to SIC, which provided the data. Many thanks to Professor Dylan Jones-Evans and Dr. Anna Bergek for valuable comments and support on an early draft of this paper. Finally, we appreciate the feedback from Per Laurell (Managing Director, Sweden Innovation Centre); Roger Yttergren (Sweden Innovation Centre); Torbjörn Hansson (Managing Director, Stockholms Teknikhögskola and former member of the judgement group of Swedepark); Sven-Arne Paulsson (Incubator Manager, Västerås Technology Park).

## ENDNOTES

1. This variable consists of applicants with sole proprietorship and of applicants that have applied as private persons, which also were allowed. Henceforth we will refer to this variable as sole proprietorship.
2. Interviews with Per Laurell and Roger Yttergren at SIC
3. Interview with Torbjörn Hansson, The judgement group of Swedepark
4. Interview with Sven-Arne Paulsson, Director of the incubator of Västerås Technology Park
5. Interview with Torbjörn Hansson, The judgement group of Swedepark
6. All figures are taken from SICs own material and statements.
7. Per Laurell and Torbjörn Hansson, as above

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