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THE EFFECTIVENESS OF THE FINNISH PRE-SEED AND SEED POLICY SCHEMES TO PROMOTE INNOVATIVE HIGH-GROWTH ENTREPRENEURIAL VENTURES

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ABSTRACT: This report assesses the effectiveness of the supply and demand side policy initiatives in Finland targeted at pre-seed and seed stage businesses, particularly from the viewpoint of high-growth ventures. In order to obtain a yardstick by which to judge the current policy mix in Finland, this study focuses on systemic functions which these policies can be expected to fulfil to promote a viable high-growth entrepreneurial eco-system. When considering the features of major policy initiatives the study draws on analysis of venture capital policies and especially of typical failures in policy initiatives, as presented by Lerner (2009). The study assesses existing pre-seed and seed stage policy schemes and even though the present policy mix has successful elements, it also exhibits serious flaws in programme design and implementation, which may be counteractive to the achievement of the policy objectives. There is also a need to improve overall policy coordination and strategic leadership in the promotion of high-growth ventures.

Keywords:
Venture capital -directed policy
Seed stage initiatives
Policy design

JEL codes: G240, O38

1. Introduction

An important motivation for the VICO project was an observation that EU countries exhibit an unsatisfactory rate of creation of "gazelles", innovative high-growth entrepreneurial ventures, and that this applies particularly to knowledge-intensive industries (VICO technical annex, p. 65).[1] It has been noted that, at least in the USA, the 'gazelles' generate a disproportionately large amount of wealth and job creation as compared with start-ups in general (Shane, 2009). The observation of a low rate of creation of 'gazelles' is highly pertinent for Finland, where the number and share of high-growth ventures is quite low (Pajarinen, Rouvinen, 2009; Murray et al., 2009). Over the years, Finland has launched several policy initiatives which can be expected to have influenced the emergence of entrepreneurship and innovative ventures. There have not, however, been any policies especially targeting *high-growth* ventures until quite recently. The effectiveness of these policies is an important question, which can be considered even early on after the launch of activities.

This paper aims to assess the effectiveness both supply and demand side policy initiatives in Finland targeting the pre-seed and seed stage, and in particular from the point of view of targeting high-growth ventures. The initiatives include attempts to provide funding for testing and developing business ideas built around inventions (to enhance the supply of funding), and to help the new ventures acquire business experience, develop their business models, acquire marketing experience and other competencies in order to promote deal flow (to enhance the demand for venture funding).

A study of the effectiveness of policies requires that we can compare their achievements with their objectives. However, when we aim to study the effectiveness of a mix of policies we cannot just pay attention to each individual policy initiative, but need to compare the operation of the system with a set of more general objectives which such very early stage policies can be expected to promote. Of course, an elementary indication of the success of policies would be the number and share of high-growth ventures. If there are no changes in either respect over time, we can judge that the policies have not succeeded, provided of course, that other conditions have stayed the same. However, since it is not possible to control for all the circumstances, the conclusions can only be tentative. When attempting to assess recent policies, we cannot use performance measures until some time after their launch. Irrespective of these

[1] This report follows the definition of high-growth enterprises as defined by the OECD, with average annual growth of turnover or employees greater than 20% a year, over a three-year period, and with ten or more employees at the beginning of the observation period (Murray et al., 2009, 148).

difficulties, a fundamental question concerns finding the most important bottlenecks which prevent the existing schemes from working as desired.

The main purpose of this paper is to explore empirically the effectiveness of policies, by paying attention to bottlenecks in current policy schemes. It is, at the same time, an exploration into the ways in which the effectiveness of a mix of policy schemes can be studied.

In order to obtain a yardstick by which to judge the current pre-seed and seed stage policies in Finland, this study draws on systemic functions which these policies can be expected to fulfil to promote a viable high-growth entrepreneurial eco-system. The analysis is based on the perspectives of technology and systems change as espoused by evolutionary economics (Nelson, Winter, 1982; Dosi, Nelson, 1994; Avnimelech, Teubal, 2006). The systemic features are used as a criterion by which we may judge whether the policy initiatives and in particular their mix are working in a satisfactory manner. When considering the features of major policy initiatives the study draws on analysis of venture capital policies and especially of typical failures in policy initiatives, as presented by Lerner (2009).

The empirical findings draw on data obtained through documents, reports and studies. Furthermore, representatives of different groups in the early stage entrepreneurial activities have been interviewed. These include CEOs of start-ups, managers of business accelerators, managers of public funds or organisations involved in early stage funding or devising policies, and persons actively engaged in promoting high-growth entrepreneurship and policy initiatives. The number of interviews carried out for this study is twenty. This study uses the interviews as an information source which helps to understand how the system operates rather than as a basis of opinion measurement concerning its performance.

2. The analytical perspective

2.1. Features of techno-economic systems

When considering the role of the pre-seed and seed stages in a viable techno-economic[2] system, the analysis draws on an evolutionary systems perspective. In this context, the ideas about the importance of diversity and variation, and selection across diversity are highly pertinent. To put it very simply, the basic idea in this thinking is that in the face of technological change firms experiment with new technologies and compete with each other

[2] For example, Carlsson and Stankiewicz (1991) define it as "a dynamic network of agents interacting in a specific economic/industrial area under a particular institutional infrastructure and involved in the generation, diffusion and utilization of technology".

on the market (Nelson, Winter, 1982; Dosi, Nelson, 1992; Avnimelech, Teubal, 2006). They compete for customers and introduce new products and processes to the markets, which act as a major selection mechanism for the 'fitness' of the technology and also the firm. An important point is that there cannot be a pre-selection of the winner firm or technology. Furthermore, the products and processes which firms introduce are influenced by their routines, that is, standardised patterns of actions which firms have developed and propagate. The competencies a firm has and/ or acquires and which influence its competitive position depend heavily on its routines in terms of searching for better ways of doing things (Dosi, Nelson, 1992). Firms learn and adapt and acquire new capabilities.

When applied to venture capital stimulated growth of high-growth entrepreneurial ventures, the principle of diversity applies both to the investors (/investor types) and the portfolio firms, the start-ups. Since no one knows in advance which of the investment decisions and ventures will succeed, there have to be enough actors who take risks and compete for promising new ventures. This implies that there has to be a venture capital market with a sufficient volume and stability of actors (Teubal et al., 2008). At the same time, there have to be enough new ventures which compete for equity thus providing the investors with opportunities to make profitable investments. These two co-evolve. The function of the pre-seed and seed stage in this system is the promotion of diversity and variation, 'deal flow', across which there is a selection of start-up firms for further development.

The selection function operates through different mechanisms. The start-ups can cease to operate at different stages. Their chances can be enhanced if they obtain venture capital backing. The selection of portfolio firms is of course an obvious selection mechanism. It provides them with funds for their further development. The literature on venture capital has paid a lot of attention to the fact that the venture capitalist adds value to the portfolio firm through many mechanisms other than money: because of asymmetrical information, by scouting and screening ventures they can find those that have 'hidden value', through signalling of a firm's quality to other potential financiers, and by providing value-adding services in marketing, strategic and management support including governance, in other words, acting as a 'coach' (Baum, Silverman, 2004; Timmons, Sapienza, 1992; Harrison, Mason, 1992; Sapienza et al., 1996; Knockaert et al., 2006). These value-adding services or coaching can be regarded as enhancing selection, because they provide the ventures with advice and capabilities that help them become stronger for the market competition and eventually to become successful. Thus, filling in just a 'financial gap' is not sufficient. This is especially important in the very early stage, in the pre-seed and seed stages, because new

start-ups, especially if they have their origin in academic research, usually lack these skills. Furthermore, developing a start-up firm from one stage or level to another requires different sets of skills. ‘Coaching’ firms to make appropriate decisions to acquire these skills by recruitment, replacement of key persons, or through other means is one of the important functions of a hands-on investor.

An important feature of this system is the positive role of failure. The selection across variation and diversity implies that a lot of the start-up firms and the technologies and innovations they are developing fail and disappear. The selection among the firms/technologies is as important as the creation of variety. It is therefore important to let non-viable candidate firms (technologies) die. Keeping them alive too long can be as important a mistake as failing to support promising candidates for success (Eliasson, 2003).

The two processes, creation of variation and diversity and selection across them happen all the time in the development of new technology, firms, venture capital markets etc. However, once, e.g., technology develops along a trajectory and stabilises some of the basic choices, the potential new solutions that are open become less numerous. The selection function operates across less radical or divergent potential solutions. The same applies to individual firms that are developing their business potential based on new technology.

The general framework conditions for firms, such as regulation, taxation, bankruptcy laws, the bureaucracy needed for establishing a firm etc. play an important role both for the start-ups firms as well as for the venture capitalists and other investors in the pre-seed, seed, and start-up phase (see, e.g., Murray et al., 2009, 152). When it is a question of high-tech start-ups R&D and innovation support also play an important role. The consideration of these factors as part of policies intended to promote high-growth firms is thus vital.

As a conclusion, early on in the commercialisation process and the development of innovative new products, services, and start-up firms, experimenting and ensuing variation and diversity play an important role in the ability of the products, services and firms to compete. Inevitably, however, most of the competing variants die and fail, and not necessarily for reasons of technological superiority (Dosi, Nelson, 1992). Selection thus begins to play a more pronounced role in the process. Variety created at this stage is restricted by the trajectory of development.

The ability of startup firms to survive can be greatly enhanced if aided by experienced venture capital investors able and willing to provide them with resources, money and skills. This will enhance the firms’ routines helping their learning processes in all their activities from search (R&D) activities to manufacturing, management, and marketing.

2.2. Requirements for policy

A lack of or weakly developed venture capital markets and industry as well as a low rate of creation of high-growth entrepreneurship are important motivations for launching initiatives to promote venture capital activities fostering deal flow and supporting the creation of high-tech, high-growth entrepreneurship. This study assumes that a major role for public action is to support circumstances which are conducive to the creation of entrepreneurial ventures, or citing a recent report on the Finnish system to support young innovative companies, the role of the government is "focused on providing the enabling environment that will allow informed and transparent markets to work efficiently" (Maula et al., 2007, 63). This can take place through different means. The most appropriate means are indirect, like the creation of the above-mentioned framework conditions, but in the promotion of high-tech clusters and high-growth innovative enterprises, direct intervention may be called for in the very earliest stages. Market and institutional failures are most acute at this stage. Designing and implementing intervention is, however, highly challenging, and as indicated by the title of Lerner's recent book, "Boulevard of Broken Dreams" (2009). Lerner's analysis (2009) was related to venture capital policy initiatives, but is relevant also for the pre-seed and seed stage. Drawing on Lerner (2009), a list of common errors in policy design and implementation could be as follows.

1) The most essential requirement is that the public authorities designing a venture capital policy need to understand how the entrepreneurial and venture capital markets operate and what incentives are effective. If this is not the case, they may make many mistakes, for example, related to the following factors.

a) An entrepreneurship or venture capital initiative requires a long-term commitment on the part of politicians and public officials. It may take a long time until tangible effects are realised. This means that programmes should not be abandoned too quickly, and if there are initial failures, they should be fine-tuned rather than abandoned. The reverse is also true, namely, that at some point, policies need to be phased out and a failure to so may be another mistake.

b) Structuring or designing the programme in a way that enables it to achieve its objectives is highly pertinent. Lerner presents two examples from Finland *(ibid*., p. 116): The Finnish Industry Investment Ltd (FII) and The Finnish National Fund for Research and Development (Sitra) were initially founded to alleviate the funding gap in the early stage. However, both were given a requirement to make investments

which were profitable and a need to invest on equal terms with private industry (Maula et al., 2007), 45). These principles have reduced their opportunities to act counter-cyclically and to help to create new, viable venture capital funds investing in early stage companies (ibid., 46).

c) The programme size needs to be appropriate, not too small or too large. Too small a programme does not make any difference. The companies receiving its funding are unlikely to have enough capital to move to the next level. Yet, too large public programmes can crowd out private funding.

d) Flexibility here refers to the ability to allow the investee firms to make changes in their direction which are deemed necessary under the uncertainty inherently faced by young firms. Programmes which are too fixed in their definition of their participation rules may turn out to be a hindrance rather than a promoter of the success of early stage companies.

2) The second major problem regarding public programmes stems from a top-down approach in which public officials choose the sectors or locations that can be funded rather than listening to the markets. One way to avoid this is to require that the entrepreneurs or venture capitalists receiving public funds have to raise matching capital from private sector sources thus allowing private actors operating on the market to select the investment targets.

3) Even though the design of a programme might be right, its implementation can bring about failures. Lerner (2009) lists examples of such implementation problems: a failure to take into account incentives which work in the area, failing to evaluate the programme and failing to allow, e.g., beneficial internationalisation. Inconsistent programme features, changing the rules midway etc. also constitute implementation problems.

The following Table 1 encapsulated the dimensions listed above and will be used to assess individual support schemes in the following analysis.

Table 1. Dimensions of programme features influencing their effectiveness

	timing	design	size	flexibility	top-down selection	implementation
Programme 1						
Programme 2						

4) Teubal et al (2008) have paid attention to the fact that designing policies which promote venture capital, including the framework conditions affecting entrepreneurship, requires that there is a strategic level able to coordinate various policy initiatives and have a broader view. This also implies that policy initiatives are consistent and systematic. Early-stage initiatives to promote the funding and coaching of start-ups may be successful in themselves but fail because there was a failure to create framework conditions, such as taxation conducive to the emergence and development of high-growth enterprises.

To summarize, the empirical study will draw on two different types of perspectives, on the one hand, on the fairly general assertions concerning systems features which a viable techno-economic system needs to entail, and on the other hand, on empirical evidence on common errors in the design and implementation of venture capital policy. The systems features include an observation that there needs to be variation among the portfolio firms so that there are potentially successful cases to meet the market competition and the selection across them. Policies may be addressing variation through the promotion of deal flow. The supply of funds helping insufficiently developed financial markets to operate and thus providing resources which enhance the development of the ventures will eventually help the selection of the ventures with the best potential to meet the market competition. As noted, failure and the screening of unsuccessful cases is important. For the policies to be effective, they need to be based on understanding of how the entrepreneurial and venture capital markets operate and what incentives are effective. Both programme design and implementation need to be based on this understanding. Consistency among the initiatives and coordination of policies are also highly important for the success of the programmes. The next section will use the dimensions cited above as a concrete frame in the assessment of the effectiveness of existing policy schemes in the pre-seed and seed stage.

3. Finnish policies: empirical evidence

3.1. Pre-seed schemes and support of diversity

3.1.1. Innovation activities and their promotion

Innovation activities, including R&D, are perhaps among the most essential factors for the creation of new technology-based ideas for experimentation and development of business opportunities. Thus an important part of the policy mix aimed at promoting new and inventive ideas and diversity of potential innovations is R&D policy. In Finland governments have for a

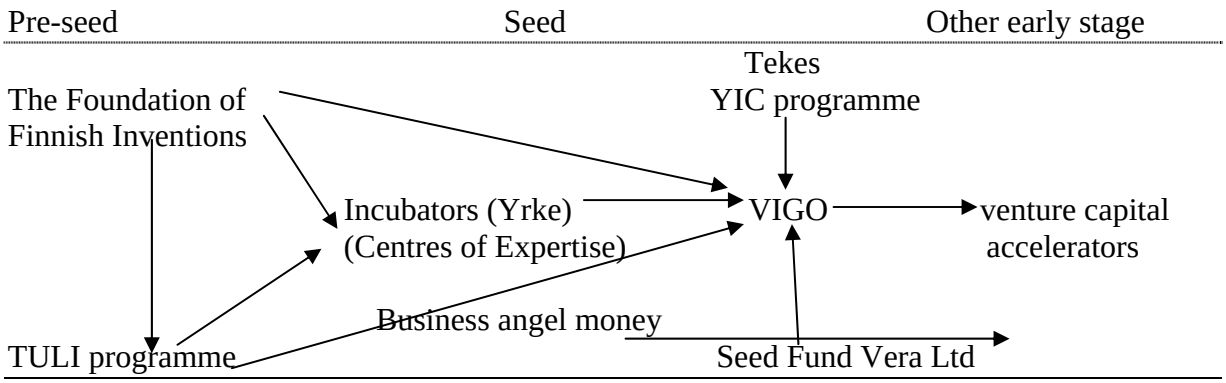
long time put priority to research policy and invested a great deal in research activities (see, e.g., International evaluation, 2009). There is also new thinking (broad-based innovation policy) and a willingness to experiment with new policy schemes (Edqvist et al., 2009). Tekes, The Finnish Funding Agency for Technology and Innovation, has since its inception in 1983 grown into the largest funding agency and one which supports research and innovation activities in enterprises and public organisations promoting their collaboration. Tekes has expanded its activities from R&D support to promoting commercialisation, including pre-seed schemes and, recently, schemes to promote high-growth enterprises in their development (see later on in this report). Overall, promotion of research and innovation activities is a highly successful part of the Finnish system.

In terms of promoting diversity, however, the Finnish R&D and innovation policy has a potential problem because of its focus on the short-term. This is evident in, e.g., 1) the resource development of the universities whose own research funds have not grown as much as overall R&D funds in the country; they are currently at the level of 2002, and 2) the fact that external funds of universities from industry, ministries and Tekes, are sizeably larger than those from the Academy of Finland, which is the Research Council system and finances basic research (Suomen tieteen tila ja taso 2009, 2009). We may question whether enough support is given to non-directed and path-breaking research on which new commercial opportunities might be built in the longer term. The connection between fundamental advances in basic research and the establishment of successful entrepreneurship is evident in especially biotech and life sciences, where the ‘star’ scientists are actively involved in commercialisation activities (Zucker et al., 1997). Strong scientific foundation is also important for the development of capabilities in newly emerging areas of science, e.g., the role of chemistry for nanotechnology. If research and training in important scientific areas has been neglected, a country may lose the possibility, not just to be on the vanguard, but also to be able to catch up quickly enough in promoting new businesses in these areas.

3.1.2. Pre-seed schemes

Figure 1 presents schematically the major schemes of relevance for the policy initiatives for the promotion of high-growth ventures, excluding R&D and related innovation activities and their support.

Figure 1. Existing pre-seed and seed stage schemes



Several programmes are designed to promote diversity in the pre-seed stage: the Foundation for Finnish Inventions, the TULI programme, and the Technology Incubator Programme (see Appendix 1). These programmes are complementary and support the demand factors by targeting the creation of startups. The Foundation for Finnish Inventions and the TULI programme screen inventions of high innovation potential for further development (as independent businesses or through licensing) and give money to the initial phase developments. In Finland technology incubators do not grant money and do not make investments in the firms accepted within the incubator, but provide premises and services to start-ups. Figure 1 has in parenthesis also the national Centre of Expertise Programme. It also provides facilities to start-ups, but its major goal is to promote regional development (Edquist et al., 2009).

3.1.3. Effectiveness of the pre-seed schemes

The three above-mentioned schemes can be regarded as necessary systemic elements for the support of new business ideas, built around technological inventions and their further development towards innovations. They represent schemes aimed at promoting diversity/variation and experimentation with new inventions of potential business relevance. They are not, however, especially targeted to high-growth businesses but more generally to help to commercialise inventions and thus to transform them into successful innovations. The schemes have regionally dispersed networks of experts and facilities and attempt to screen potential ideas throughout the country.

a) Timing

Each of the three programmes have continued for quite some time with the oldest, the Foundation of the Finnish Inventions, dating back to the early 70s, the first TULI programme initially starting in 1993, and regional incubators having operated a considerable length of time. Activities have been developed through fixed-period specific programmes. By their nature, the activities these schemes support are a more or less permanent part of the system. However, whether these schemes are effective or not is a good question. The fact that there have been changes in the organisation and principles even half-way in the life-time of particular programmes can be interpreted as an indication of dissatisfaction with their effectiveness or efficiency. It may also be evidence of inconsistency in implementation. The problems with effectiveness are especially related to the technology incubators, which in Finland have a very limited role.

b) Design

The technology incubators in Finland do not invest in the new ventures that are located in their premises and do not provide coaching. They have been characterised to be, to a large extent, real estate businesses which offer diverse services and facilities for start-up firms. In the interviews the rents of these incubators were alternatively judged as expensive or reasonable. Apparently there are differences across incubators in their rents, but also the needs and criteria by which the rents are judged vary from start-up to start-up.

The development programme of 2003-2007 (Yrke) included features which would have engaged the technology incubators in the selection of money recipients among new ventures. However, such features were removed midway and Tekes (the Finnish Funding Agency for Technology and Innovation) changed its funding principles with regard to the scheme: public funding was not directed to the incubators but rather to the start-up firms. An evaluation of the Technology Incubator Development Programme did not regard this as appropriate for the incubators, which are targeting very early stage (novice) entrepreneurs (Hytti, Mäki, 2008). These were not regarded as ‘sovereign customers’ capable of knowing what services they need and wish to buy (*ibid.*).

The grants from the TULI programme and the Foundation of the Finnish Inventions are typically used to engage the services of a consultant to draft business plans, market and competition analyses, commercialisation models etc. These schemes – together with other support systems to set up businesses – have given rise to what several interviewees have called “a consultant ecosystem”. It is a system which feeds itself. The plans of the consultants

typically propose that the venture/project/firm idea move to the next stage needing further plans again drawing on the help of consultants. The criticism addressed at this system was based on the observation that very few of these consultants had practical business or high-growth enterprise experience, and in particular, experience in export-oriented businesses. The plans thus produced were regarded as being of varied and overall questionable quality and value.

c) Size

Aside from the technology incubators, which do not allocate resources, the sums which the TULI programme and the Foundation for Finnish Inventions distribute are in most cases quite small ranging, e.g., in the TULI programme from a few thousand to a maximum of 30 000 euro and in the Foundation for Finnish Inventions, support ranging from 1000-200 000 euro with the latter being the maximum for a second stage business according to the EU de minimis rule (for patenting, product development and commercialization costs and payable back if the project has commercial success). The larger support if connected with coaching by business angels could provide positive results, but there is not evidence about the way in which this works. Most of the sums are so small that they can be used for the above-described consultant services, but not for other business development activities. These sums can be regarded as sub-optimal. A frequent comment was that larger grants to fewer participants would be more effective.

d) Top-down selection

The described programmes are open to all fields and these programmes aim to provide support to a wide range of inventions in all fields of application with a potential business idea. Even though the TULI programme especially screens universities and research institutes for promising ideas, the Foundation of Finnish Inventions is open to all kinds of innovative ideas and provides them with support. There is thus not specific selection of fields or clusters. From the point of view of promoting high-growth businesses, the schemes, however, were perceived to scatter their support too widely and thinly.

e) Implementation

One of the principles of implementation is consistency, however, allowing for evident bottlenecks to be remedied. The above-mentioned change in the funding principles of Tekes to the technology incubators is an example of a situation where the change involved basic principles and was not in line with the programme objectives.

To summarise, there are positive features in the current pre-seed schemes. They provide support on a longer term basis and are open to all fields and ideas. They are important parts of the system, though there are questions about their effectiveness in terms of in their design and size in particular.

Table 2. Summary of the assessment of the above mentioned schemes

Criterion	Assessment	Explanation
Timing	+-	Are of long duration. Specific development programmes for fixed periods of time. Have been able to prove their effectiveness, which especially for the technology incubators is low.
Design	-	Depend on a 'ecosystem' of consultants; the competencies of whom have been questioned; incubators provide facilities and some related services; no investments and no coaching
Size	-	Most funds granted very small in size; suboptimal
Flexibility	?	
Top-down selection	+-	Open to all fields and ideas; little, obviously, too little selection of individual cases especially from the point of view of high-growth enterprise support
Implementation	-	In technology Incubator Programme changing funding rules midway

3.2. Seed stage schemes: helping ventures to acquire capabilities to meet the market competition

The new business accelerator VIGO Programme, which started in 2009, represents a feature on the system which has the important function to select more promising cases for further development. Its model was taken from Israel, where the business incubators are regarded as highly successful (Ruohonen, 2007). However, the Finnish model deviated from the Israeli model in important respects, to be elaborated below. The scheme combines existing early-stage funding schemes with a – in Finland – novel concept of selecting and coaching of the portfolio firms by private actors. Furthermore, the scheme targets the best cases nationally, not regionally, as has been the prevailing practice. Thus from its inception the scheme had a great potential for success. Its design and implementation, however, entail features which could jeopardise its success and preventing it from achieving its objectives. Appendix 1 presents a description of the salient features of the programme.

The two early stage schemes, the Tekes YIC scheme and Seed Fund Vera Ltd, which provide public funds for the portfolio firms of the accelerators, are briefly analysed in the same context, though they operate as separate schemes as well (see Appendix 1).

3.2.1. Effectiveness

a) Timing

The objective of the VIGO programme was defined as promoting deal flow to enhance the development of young, high-growth companies. VIGO was set up for three plus three years. After the first three years the programme will be evaluated and the continuation of the particular accelerators will depend on the outcome of this evaluation. Having thus a fixed length is in principle an improvement in Finland, where schemes tend to become permanent, no matter what their performance. Whether the first three years is sufficient to show performance depends to some extent on the fields of portfolio firms. Three out of the six accelerators are aimed at the ICT area, especially software and internet-based solutions, and one of the other three is mainly supporting ICT-based services in life sciences area. There is thus a strong focus on the ICT area where the development cycles are quite short and inventions have to be quickly brought to the market. The timing of the scheme may thus be appropriate if the effectiveness of the measures for the accelerated portfolio firms is considered. Furthermore, since VIGO accelerators aim to help the portfolio firms acquire angel and/or venture capital funding in Finland and/or abroad, an indication of this plus an assessment of the developments made in the portfolio firms may provide some proof of performance even after a short existence.

An important outcome of the scheme, though it is not mentioned among the objectives, would be the creation of a culture in which business accelerators are established even without public support and initiatives. Promoting the creation of such a culture will probably take much longer than six years. The timing of 3+3 can, nevertheless, be appropriate for reconsideration of improvements in the incentives and principles of such a scheme.

b) Design

The VIGO Programme combines the idea of business accelerators with public funding from existing funding schemes. These two schemes are Tekes Programme for Young Innovative Companies YIC (see Appendix 1), which is strongly oriented to promoting high-growth and export-oriented young companies (max. five years old), and a public fund Seed Fund Vera Ltd making capital investments in innovative enterprises at their early stages (see Appendix 1). Each accelerator has somewhat different plans but all make some (often very small) initial investments in their portfolio firms, however, syndicating with or helping ventures to acquire further investments from business angels and venture capital funds. The intention is for the

portfolio firms to acquire supplementary funding from the two above-mentioned public funding schemes. Unlike in the Israeli model, the public funding schemes do not leave the funding decision to the assessments of the accelerators and their managers, but wish to make their own assessments. There is, thus, a double or triple evaluation process, and the public funders decide, each separately, on the merits of each case. Since these two schemes were operating before the introduction of the VIGO scheme in 2009 and operate independently of it, it is possible that the portfolio firms in the accelerators apply for funding to the same schemes outside the accelerator schemes as well. This has raised the issue of the added value of the accelerators in the process. It is true that the accelerators do pre-screening for these public schemes. However, the acceptance of a start-up in an accelerator does not guarantee and indeed has not guaranteed an automatic acceptance by the public schemes, and there have been a couple of rejections of applications endorsed by the accelerators highlighting that the public funding organisations wish to exercise their independent judgment.

There are some fundamental problems with the requirements which the public venture fund Seed Fund Vera Ltd has adopted. They include a symmetric earning model which is also used by other public investors (like mentioned in the example by Lerner, 2009, above; see also Murray et al., 2009; Maula et al., 2007). The public fund wishes to obtain the same upside as the private investors. However, since the early stage fund was established to fulfil a market failure due to the fact that private investors did not judge these investments profitable enough, it means that the public fund is not likely to take risks either. This is quite unlike the profit models adopted by, e.g., Israel, the model country in principle but not in practice, where public intervention schemes only aim to gain profit in terms of expected returns in employment and economic growth (Ruohonen, 2007; Puttonen, 2010). An important reason for having a symmetric profit model is said to be the EU rules, which would have required a new notification if the principle had not been followed. Within the EU there have, however, recently been cases where asymmetric models have been accepted. EU rules were also referred to in the refusal to grant the right for the accelerators to buy the venture after the seed stage and a very strict definition of seed stage as a firm having a turnover of 0 euro.

Unwillingness to make a notification to the EU, to modify the Finnish law in some respects, and a wish to implement the new scheme as soon as possible, were given as reasons to justify inattention to the above questions, though they had been acknowledged as potential problems.

c) Size

The size of potential public funding which a portfolio firm can obtain was regarded as quite sufficient for the needs of a seed stage venture, especially one which is in the software business, as the majority of the accelerator portfolio firms seem to be. Altogether with the funds from the Seed Fund Vera Ltd, Tekes, the accelerator, owners, and business angels or other investors, a venture may obtain around two million euro for the first two years.

In itself, the Tekes scheme YIC for Young Innovative Companies itself was highly appreciated. It is meant for the overall development of the business activities of a start-up (max five years old) without setting requirements with regard to the specific set of activities for which the support is granted. This was regarded as a benefit of the programme. It may involve marketing, building up of a sales organisation, R&D activities etc. being a very liberal support type. A lot of these companies also obtain specific Tekes' R&D support, but if simultaneous, it is reduced from the total sum. The support is divided into three phases with increasing sums of support. If a venture obtains support in all three phases, it may obtain a maximum of one million euro covering 75% of the costs of the activities. If the venture is located in the special objective areas, it can obtain even more support, but again representing at most, 75% of the costs. At each stage there is a stringent evaluation of the performance of the company.

d) Flexibility

A start-up venture has to adapt quickly to changing circumstances. This may involve changing its business model, recruitment of new key personnel and other changes in its plans. These changes were taking place in close communication and involvement of the accelerators and their managers. The fact that the public funders were involved brought some onerous reporting requirements in the situation in which the start-up changed its plans.

The regulation of the ownership shares of the accelerators and related management fees was strictly defined in the VIGO programme, and regarded as too inflexible, thus limiting the incentives the programme provided for the accelerators. An alternative would have been to leave them, at least to some extent, to the market mechanism.

e) Top-down selection

There is in principle no top-down selection of fields in the accelerator programme, even though each accelerator is in a specific field so that the accelerator managers are able to coach the portfolio firms adequately. There was no pre-selection of fields in the original accelerator competition. However, the outcome that four out of six selected accelerators are from ICT-

related areas probably reflects built-in requirements in the programme design with regard to the timing of the returns (see Appendix 1). This is related to the fact that the VIGO Programme was originally based on the ideas of a report, outlining a "Virtual ICT Accelerator" (Ruohonen, 2007). It is also possible that as a result of the boom in the ICT area in Finland in the 1990s and early 2000s there are more individuals in ICT than in other areas capable of and with resources for accelerating business developments of start-ups. The result is probably not related to the overall number of potential business ideas in this area, since according to an estimate, about 30% of promising business ideas in Finland are in this area (interview).

The overrepresentation of the ICT area is also noticeable in the Tekes programme YIC, where most of the scheme recipient firms are in this area. Again it is not based on an ex-ante selection, but an outcome of the programme criteria.

These observations raise the question of whether the general support criteria created for the new schemes for accelerating the growth of high-tech, high-growth firms do indeed neglect other areas. Life sciences are a case in point, the support of which is highly challenging because of long development cycles (see, e.g., McKelvey, 2000) and where earlier Finnish schemes have failed to create successful programme structures to promote the growth of start-ups in this area (see, e.g., Luukkonen, Palmberg, 2007).

Another point in the selection is about the joint financing by the public and private actors within the programme. The adoption of joint financing in principle indicates an effort to use market factors so as to avoid a selection by the public funds only. However, the fact that public actors wish to make their own evaluations independent of the due diligence procedure and selection of the targets by the accelerator managers indicates only a half-hearted commitment to the original principles of the programme. A further drawback is, as indicated, a triple evaluation of investee firms, which delays the process. We may of course further question whether the officials in public organisations have appropriate skills and incentives to be deeply involved in the selection.

f) Implementation

When the first three accelerators were selected in the summer of 2009, they started with the understanding that they could buy the whole ownership of the portfolio firm by paying an interest to the Seed Fund Vera Ltd. This provided an additional incentive for the accelerator managers to increase the value of the portfolio firms through an active hands-on approach. However, towards the autumn, the public fund made a decision that this was not possible. This implied that there was a change in the rules after the start of the scheme, which does not

represent good governance and is not consistent. It is further to be noted that the continued presence of public ownership dilutes the ownership shares of private investors who may make larger investments later on, thus, potentially making such private investments less attractive.

The size of a service charge which the portfolio firms pay to the accelerators is related to the ownership share of the accelerators (somewhat larger when the ownership share is smaller; and as already referred to, these are strictly regulated). This fee is taken from the funding Tekes potentially grants to the portfolio firm. This practice makes it very visible to the portfolio firms. Some of these firms, being unaccustomed with this kind of practice, have questioned the value they are obtaining from the service. There is an additional problem with this service fee. If the portfolio firm obtains more than 50% support for the project (that is, is unable to obtain at least 50% from other sources, such as the accelerator, business angels or venture capitalists) it is regarded as a unit of public procurement. According to the interpretation of EU laws by the Finnish authorities, this would require that the portfolio firm uses competitive tenders for the services paid with the public support. The service fee of the accelerators is regarded as such an item. In principle, it would lead to a situation in which the portfolio firm would have to arrange a tender competition among accelerators for the services these render, and not the other way round.

3.2.2. Summary

To sum up, there are new features in the new VIGO programme and an aim to combine public resources with private experience and to create a programme which would emulate some of the features of the highly successful Israeli incubator scheme. The programme was, however, launched as quickly as possible with the outcome that it contained design features counterproductive to its goals. Even though it has in principle been a good idea to combine existing funding schemes with this programme, these schemes have brought with them certain problems, e.g. in Seed Fund Vera Ltd those related to the symmetric expectations concerning the returns to the investment. Additionally, the fact that the public agencies insist on making yet another evaluation of each case, on top of the selection by the accelerators, seriously undermines the rationale of the whole scheme. There are questions about the value-added of the programme, since the ventures can apply to these public schemes irrespective of being part of the accelerator programme. The major value-added is of course the screening and coaching the accelerators provide as well as the extra funds they can bring from their own resources and networks of investors. The coaching the accelerators bring to the programme is

essential, especially considering that the public actors involved in the scheme do not provide these services. The incentives of the accelerator managers to have an active hands-on approach are related to the value gained by the ventures if successful. However, even here some of the incentives were removed early on when the accelerators were barred from buying out the public fund's stake. It seems that the programme is implemented half-heartedly, and the public funding agencies do not sufficiently trust the market mechanisms and their representatives, the accelerators, which they are expected to team with in the programme.

Table 3. Summary of the assessment of the VIGO scheme

Criterion	Assessment	Explanation
Timing	+-	Programme is planned for 3+3 years with an interim evaluation; improvement in the Finnish context. Overall, the length may be sufficiently long for testing the concept, but too short for the creation of business accelerator practices or culture to continue even without special public programmes
Design	-	Unclear role and value added of VIGO because the accelerators cannot decide on the funding to the portfolio firms; symmetric upside model of the public equity fund supplying funding to the programme
Size	+	Adequate resources
Flexibility	-	Governmental requirements bringing inflexibility
Top-down selection	-	Programme expectations are tailored for the ICT sector. Public funder and governmental office decide on the resources to the portfolio firms
Implementation	-	Changing rules midway

3.4. Coordination and consistency

The international evaluation of the Finnish innovation system drew attention to the need for an integrated support service available for high-growth enterprises (Murray et al., 2009, 180). The interviews carried out for this study also indicated a lack of a high-level strategy and coordination of policy in the promotion of high-growth businesses. There are notable differences of opinion among the different ministries (Ministry of Finance and the Ministry of Employment and the Economy) on important policy questions such as taxation that can provide incentives to entrepreneurship and encourage investments. The failed initiative in autumn 2009 to provide tax relief for business angels if the returns are reinvested in young enterprises is a case in point. Even departments within the Ministry of Employment and the Economy seem to diverge in their policies concerning the public funding agencies and funds under the Ministry's tutelage. The result of a lack of coordination is policies which only half-heartedly attempt to remedy problems and bottlenecks observed.

4. Conclusions

The Finnish system seems to be better equipped for promoting a diversity of ideas, inventions, and ventures than helping them to compete on the markets and in the selection of potential successes. Active innovation policy is an essential part of the creation of diversity and in this respect the country overall seems to perform quite well. The promotion of research and innovation activities is a successful part of the Finnish system. There are, however, potential problems in the long run, namely, Finnish policy is too much focused on the short term. Too little attention is devoted to the support of undirected basic scientific research, which is important in the creation of really new ideas. A strong scientific foundation is also important for the development of capabilities in newly emerging areas of science, e.g., the role of chemistry for nanotechnology. If research and training in important scientific areas has been neglected, a country may lose the possibility, not just to be on the vanguard, but also to be able to catch up quickly enough in promoting new businesses in these areas.

The policy schemes supporting the commercialisation of inventions in the pre-seed and seed stage screen potential innovations throughout the country and are essential elements of the system. They are not, however, especially geared to potential high-growth enterprises and distribute, in most cases, very small contributions, which are in general suboptimal to help firms develop into high-growth firms.

In support of seed stage investment and related coaching, which provide important resources for the firms to survive in the selection, there is a recent new scheme, the new business accelerator VIGO Programme, started in 2009. It aims to emulate the Israeli model of a business incubator programme generally regarded as highly successful (Ruohonen, 2007). The scheme combines existing early-stage public funding schemes, Tekes YIC scheme and Seed Fund Vera Ltd, providing funds, but not coaching for the portfolio firms, with a – in Finland – novel concept of selecting and coaching of the portfolio firms by private actors, who have experience of high-growth enterprises. Furthermore, the scheme targets the best cases nationally, not regionally, as has been the prevailing practice. Thus from its inception the scheme had a great potential for success. In its design and implementation, however, the Finnish scheme deviates from the Israeli model in important respects and contains features which could jeopardise its success preventing it from achieving its objectives.

The first year of the new business accelerator scheme VIGO has so far not succeeded as well as was intended. This is because the programme design and implementation did not go

as far as would have been required. Unwillingness to make a notification to the EU, to change the law, and the vested interests of existing stakeholders, that is, public agencies and public venture capital organisations wanting to continue their prevailing practices, prevented experimenting with a really new policy design. As a consequence, the schemes carry out double or triple evaluation, do not trust the private actors to be able to do the selection of supported ventures, require symmetrical returns to the public actors, and as a consequence, raise the question of the added value of the new scheme. Furthermore, most of the existing accelerators are in the ICT area, which raises the question of too limited a focus in the programme.

The lack of coordination at a high strategic level is a further problem in the Finnish system. This is evident especially in the promotion of framework conditions needed for the creation of entrepreneurial cultures, where important reforms are not pushed through, but also in a lack of high-level commitment for the promotion of high-growth ventures and incentives. The half-hearted design and implementation of the VIGO programme is a case in point.

Appendix 1.

The Foundation for Finnish Inventions dates back to 1971 (and even to the '50s when its predecessor within the Finnish Culture Foundation started its activities). The Foundation is a private law based foundation, but its activities are mainly financed from the government budget through the Ministry of Employment and the Economy. The Foundation has a country-wide network of agents who help screen promising inventions for support and further development, based on 15 Centres for Economic Development, Transport and the Environment that started operating on January 1st, 2010, and innovation agents in universities and polytechnics. It also uses a network of business angels for spurring its best cases to develop the business idea. Support can be given to the inventions made by individual citizens, university researchers, and micro-enterprises.

The Foundation grants two types of funding. First, it can grant a small-scale support ranging from 1000 to 2000 euro for initial phase developments. This support can, for instance, be used to develop a prototype. This support type does not need to be paid back. Second, the Foundation can grant support for patenting, product development, and commercialization costs, with the support ranging from 2000 to 200 000 euro. This type of support is required to be paid back in case the project is commercially successful. Since the beginning of 2005 The Foundation has followed the EU *de minimis* rule.

The TULI programme supports projects in two phases: first, searching for and evaluating new, research-based business ideas in the local innovation environment; and, second, piloting the ideas with the greatest potential towards commercialisation. In practice, the latter phase usually means hiring some third-party consultant to work on the idea, by, for example, conducting a preliminary market survey or preparing an initial business plan. Realisation of the technology-based business idea can take place either in a new firm or in an established firm as a new business area. TULI is managed and co-ordinated by the government agency Tekes (Finnish Funding Agency for Technology and Innovation), though there are plans to move part of the activities to the Foundation for Finnish Inventions. TULI has an extensive network of commercialisation experts who work at universities seeking and evaluating new research-based ideas with innovation potential. TULI has a decentralised organisation and has eight regional centres located near major universities and research institutes in Finland.

Technology incubators differ from the activities of the Foundation for Finnish Inventions and the TULI programme in that they do not grant money and in Finland do not make investments in the firms accepted within the incubator but rather provide premises and services to start-ups. There was a specific Technology Incubator Development Project (Yrke) in 2003-2008., coordinated by Sitra, the Finnish Innovation Fund[3], together with the Ministry of Trade and Industry (currently, the Ministry of Employment and the Economy), Tekes, T&E centres[4], and local and regional authorities. The Finnish Science Park Association TEKEL was also a background organisation involved in the project. The objective of the development project was to increase the number and improve the quality of new competence-based enterprises. A specific focus in the programme was on pre-incubator processes offering entrepreneurs an opportunity to ascertain the viability of the business idea and to assess their own motivation early on before they would have made considerable investments in a start-up. The programme had a further objective to develop a funding model for incubator activities. In Finland the funding of the activities of technology incubators has largely been based on the EU structural funds. This has led to a situation in which funding has been characterised by discontinuities and uncertainties and funding targets have been changed into innovative projects.

After the development project the development activities of technology incubators were moved under the responsibility the Finnish Science Park Association's (TEKEL) business development team. A majority of the funds for the activities of the incubators comes from public sources, but mostly from local sources (e.g. the municipalities, especially big cities, finance these activities). The Ministry of Employment and the Economy also grants support through its T&E centres.

[3]Sitra is an independent public fund under the supervision of the Finnish Parliament promoting the welfare of Finnish society. Sitra's responsibilities have been stipulated by law.

[4] The Employment and Economic Development Centres (T&E Centres) provided expertise and regional services of the Ministry of Employment and the Economy, the Ministry of Agriculture and Forestry and the Ministry of the Interior. Customers (firms, but also public organisations) also had access to the services provided by Tekes (the Finnish Funding Agency for Technology and Innovation). These centres were merged with a few other regional services into Centres for Economic Development, Transport and the Environment as of January 1st, 2010.

Business accelerators (Vigo Programme)

In the spring of 2009 the Ministry of Employment and the Economy and Tekes launched a new programme, entitled VIGO, to promote the development of young, high-growth companies. The recommendations of the evaluation of the above-mentioned YRKE programme included two points which this new initiative has taken onboard: 1) the continuation of the agreement between the start-up and the incubator should be based on the achievement of milestones and 2) the funding of start-ups should be connected with the incubator either through seed funds or closer co-operation with national or cross-border venture capitalists.

The new scheme has an overall objective to increase the quantity and quality of deal flow targeted at high-growth start-ups. The scheme will use private venture capital expertise in the selection, monitoring, and coaching of portfolio firms in the scheme, which is supported from public funds. There is thus extensive public-private collaboration in implementation.

Tekes is responsible for the coordination of the programme, but the programme implementation will be based on the cooperation of the Ministry, Tekes, and two public equity organizations, the Finnish Industry Investment Ltd (government-owned investment company) and the Seed Fund Vera Ltd, which is a subsidiary of the financing company Finnvera, owned by the Finnish government. The funding instruments of Tekes and Seed Fund Vera Ltd will be the major funding tools to be used in the programme. The programme has a fixed period of six years (with a mid-term evaluation to be carried out after the first three years).

In 2009 there were two calls for accelerator teams to apply for inclusion in the programme. The first call in the programme was launched in the spring of 2009. It attracted 43 applications, and on 16 June, 2009, the Ministry of Employment and the Economy announced the first three accelerators that were accepted in the programme. In the autumn, another three accelerators were selected. The selection criteria of accelerators included previous experience by the accelerator partners in investor or business angel activities and an ability to attract venture capital funding for the portfolio firms to be selected in the accelerator.

Different accelerators have somewhat different business models. In general, however, the teams will invest their own funds in the portfolio firms, and their equity stake can be ten-twenty per cent, and the size of a monthly fee is related to the equity stake (from 4500-9000 euro). The incentive for the accelerator teams is related to the expected growth in the value of their stake within a time frame of 5-10 years. One team of 2-4 partners is expected to have a maximum of ten portfolio firms, since the team members are expected to have a hands-on approach and work in the company on a daily basis. The portfolio firms are expected to be entrepreneur-driven and the entrepreneurs should have a majority of the equity.

In order to be able to provide value-added in business development, the accelerator teams are focused on specific areas of business, such as life sciences or the ICT sector, in contrast to the general investment patterns in Finland to invest through non-focused funds.

Public funding will come from two major sources: first, from Tekes and its programme for young, innovative companies (see below). This money is either a public subsidy or a loan, and Tekes has no equity in its target companies. The second source of funding is the Seed Fund Vera Ltd (subsidiary of Finnvera plc) and it is equity based. Public funding to each accelerator during the first three years can be approximately 45 million euro, of which the share of Tekes would be around two-thirds and that of Seed Fund Vera Ltd one third. Tekes and Seed Fund Vera Ltd each will decide on the funding independently.

The overall purpose of the programme is to promote deal flow of high-growth companies, and consequently, the programme accelerators are expected to push the portfolio firms growing within the first 6 months. The actual accelerator phase is expected to be around two years. On acceptance to an accelerator, a portfolio firm is expected to have a value of one million euro, while after two years, it is expected to have grown and be ready for a venture capital investment of 3-5 million euro.

The accelerators will be evaluated on the basis of the venture capital investments they have succeeded in attracting to their portfolio firms either during the accelerator period or immediately afterwards. Evaluation will also pay attention to the international networks and relationships the accelerators and the investors have and to the realised growth of the portfolio firms. Public support for each accelerator will first be granted for three years, after which time, before any further support decision, each accelerator will be evaluated. As indicated above, the whole programme will also be evaluated after the first three years.

Tekes programme YIC: funding for young, innovative companies

Anew initiative for financing growth companies is the Tekes financing scheme for young and innovative growth companies (YIC) introduced on 1 May 2005. The scheme will significantly improve access to public funding for potential growth companies in the early stages of operation. Tekes will work closely with the start-up (seed) fund Vera Ltd on delivering the financing. The scheme is intended for young (under 6 years old) firms, which devote a minimum of 25% of their resources to R&D. The purposes for which the funds can be used are support funds

can be used are not restricted. It can entail the development of the business activities, the creation of the sales organisation, internationalization, R&D etc. If a company simultaneously receives R&D support from Tekes, this is reduced from the overall funds from the YIC scheme.

The YIC scheme grants funds in three stages with rapidly growing support of loan sums. To receive funds from the next stage requires the achievement of strict targets. The first stage is related to the planning of business activities and will entail, at the maximum, a 50 000 euro grant. It is estimated that overall, 100-150 companies will be able to be included in this first stage (this is taking place independent of the VIGO scheme). The second stage is intended for the creation of the prerequisites for growth, and the support can be a maximum of 250 000 euro as a subsidy of 75% of the costs of the activities. This second stage support is estimated to be granted to about 40-50 companies. The third stage is intended for high growth, it will entail a maximum of 750 000 euro, 75% grants or loan/risk investment. In special development areas, the support sums can be 25 % higher.

Seed Fund Vera Ltd

This fund was founded in 2005 to make capital investments in innovative enterprises at their early stages. The fund is a subsidiary of Finnvera plc., a specialized government-owned financing company. Veraventure Ltd is responsible for the management and practical activities of the Seed Fund Vera Ltd. Veraventure Ltd is also a subsidiary of Finnvera plc and was founded in 2003 to support the investment activities of regional funds. The funds of the Seed Fund Vera Ltd will be used – together with funds from Tekes – to finance the VIGO accelerators.

With regard to seed capital investment, the fund makes minority equity investments in the target enterprises. The ownership share of the fund is normally 15-40%. In addition to equity financing, other possible investment instruments are convertible bonds, bonds with equity warrants, and capital loans. The maximum investment in an enterprise is 500 000 euro. The initial investment is usually 100 000-250 000 euro. At the end of 2009, the Fund had investments in 122 portfolio firms and the invested sums, either as equity or as an option loan, was 50 million euro (Puttonen, 2010). The number of managers employed by Veraventure Ltd is nine.

The Seed Fund Vera Ltd has collected a register of business angels (over 100). It organizes four times a year a meeting where it invites business angels and potential investment target firms and acts as a broker to help bring these together.

The Finnish Industry Investment Ltd was founded in 1995 and it can make investments in funds and portfolio companies. Through its Start Fund I it has investments even in seed stage firms, but more so in other early or expansion stage firms (Puttonen, 2010).

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