

Public Financing of Young Innovative Companies in Finland

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MTI | Publications
3/2007
Industries Department

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	Commissioned by Ministry of Trade and Industry
	Date of appointment
Title Public Financing of Young Innovative Companies in Finland	
Abstract <p>The access of young innovative companies in Finland to professionally delivered sources of start up and early growth finance has improved significantly over the last decade. Despite this long-term positive trend, there are major challenges that still remain. Finland's world class innovation reputation is not yet matched by equivalent commercial success for its innovative products and services despite many recent successes. At the start of the present century, the international decline of the financial markets following the bursting of the dot.com bubble caused serious damage to technology investors in Finland given the immature venture capital infrastructure at the time. Promising but early stage enterprises were particularly vulnerable to negative market sentiments. At this crucial time, Tekes, Finnish Industry Investment Ltd., Finnvera, and Sitra all directly addressed elements of the financing problem for entrepreneurs. Each agency helped to fill the 'financing gap' experienced by young but high potential Finnish firms with a range of targeted financing instruments. Public policy enacted through these agencies has been extremely valuable, and probably essential, in helping many new young innovative companies to emerge and in supporting existing young enterprises to survive the hostile first years of the twenty-first century.</p> <p>However, over the next five to seven years, Finland needs to further develop the financing of young innovative companies to reflect current and new challenges, and to ensure the continuing effectiveness of the Finnish financing system across different stages of the economic cycle. A number of recommendations are made in this report. First, Finland should set an <i>ambitious goal</i> to make Finland one of the most vibrant investment markets in the world for investing in and creating and capturing value from young innovative companies. This market should be privately led and provide clear incentives for professional investors as well as for the entrepreneurial owner-managers to invest in and create and capture value from young innovative companies. Second, the government should give <i>clear signals of commitment</i> of making high growth entrepreneurship and private risk taking valued and rewarded in Finland. Tax incentives could be used to catalyze entrepreneurial activity and private investment and to reinforce this signal. Third, Finland should take an <i>open and global approach</i> and leverage all available financial and human resources to the nation's long term advantage regardless of their origin. Fourth, Finland should be <i>determined</i> in implementing this market-centered strategy. Accordingly, the government should remove unnecessary duplication, fragmentation and unwarranted growth of public services. The improvement of inter-agency coordination and a greater customer orientation in the provision of public finance should be a priority. The state's primary responsibility is to create the long-run conditions for the optimal working of competitive and efficient markets. Actions by the state that replace or substitute for the private and fully commercial actions of professional investors should be taken with great caution and should, at best, be viewed as temporary.</p>	
MTI contact person: Industries Department/Pertti Valtonen, tel. +358 9 1606 3614	
Key words risk capital, young innovative companies, public finance	
ISSN 1459-9376	ISBN 978-952-489-105-9
Pages 128	Language English
Price € 27	Sold by Edita Publishing Ltd
Published by Ministry of Trade and Industry	

Foreword

Notwithstanding the significant increase in publicly supported sources of risk capital available to Young Innovative Companies in Finland, there still remain important challenges to be addressed. We have to ensure that the business environment in Finland becomes increasingly attractive to risk taking by private investors. This means matching exciting new technologies with increasingly world experienced and ambitious managers in a transparent and competitive environment that is strongly supportive of investors in entrepreneurial finance.

We also need Finnish based venture funds that are bold enough to invest in early stage ideas and big enough to maintain that commitment across multiple rounds of finance. As yet, such VC funds are more likely to be found in California or Boston rather than Helsinki or Tampere.

In 2006, the MTI commissioned three academic specialists to give an expert view as to how the Finnish Venture Capital market might develop in the next five to seven years. Importantly, they were also asked to state their opinions as to the optimal future role for the Finnish government and its business support agencies.

I would like to extend my thanks to the three authors of this report and to the many persons in Finland and beyond who assisted in their enquiries. I strongly believe that it provides a number of important foundations on which both public and private interests in Finland can construct a commercially successful, and continually innovative, entrepreneurial economy.

Kalle J. Korhonen
Director General
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Acknowledgements

In this study, we have received valuable support from many individuals and organizations. We wish to thank all those individuals who contributed their time and insights in the interviews carried out as a part of this study (listed at the end of the report) and many others who shared their views with us. These included, among others, the participants of the NORFACE Venture Capital Policy Research Seminars in London and Helsinki in 2006. We are also grateful to the FVCA, EVCA, IVC Research Center and NVCA for providing data on venture capital in Finland, Europe, Israel and the United States, as well as to the Finnish Federation for Entrepreneurs and Finnvera for sharing data on the financing of Finnish SME companies collected in the bi-annual survey. We also want to thank the Ministry of Trade and Industry and Finnish public financing agencies including Finnish Industry Investment Ltd, Finnvera, Sitra and Tekes for providing information to support the study. The contents and findings of the report, including any errors of fact, interpretation or omission, remain our sole responsibility.

December 2006

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Executive Summary

The access of young innovative companies (YICs) in Finland to professionally delivered sources of start up and early growth finance has improved significantly over the last decade. Today, YICs have a considerable choice in the selection of both debt and equity financing instruments. In contrast to the recent past, funding for promising young companies is relatively easy to arrange through currently available public sources, particularly in the seed and startup stage. Also an entrepreneurial career has become a much more widely accepted option in Finland both for recent university graduates and seasoned executives alike. Compared to the situation ten years ago in Finland, there are now many examples of successful entrepreneurs providing relevant role models. In line with this growing awareness, the sophistication and knowledge of Finnish entrepreneurs has increased considerably over time.

Despite this long-term positive trend in the financial provision to young innovative companies, there are major challenges that still remain. Finland's world class innovation reputation is not yet matched by equivalent commercial success for its innovative products and services despite many recent successes. At the start of the present century, the international decline of the financial markets following the bursting of the dot.com bubble caused serious damage to technology investors in Finland given the immature venture capital infrastructure at the time. The market has not yet fully recovered and institutional investors remain reluctant to consider European venture capital as a relevant asset class. However, an increasing number of success stories, improving investment returns in European VC funds, and the existence of several professional, private general partners currently raising new funds are each likely to contribute to a market recovery in the coming years.

With both the increased experience of the Finnish entrepreneurial infrastructure and the economy's continued technology and innovation development, there is a much more robust base for a vibrant venture capital market now than ever before. During the bearish years of 2002–2005, it was very difficult to raise private venture capital funds. Promising but early stage enterprises were particularly vulnerable to negative market sentiments. At this crucial time, Tekes, Finnish Industry Investment Ltd., Finnvera, and Sitra all directly addressed elements of the financing problem for entrepreneurs. Each agency helped to fill the 'financing gap' experienced by young but high potential Finnish firms with a range of targeted financing instruments. Public policy enacted through these agencies has been extremely valuable, and probably essential, in helping many new young innovative companies to emerge and in supporting existing young enterprises to survive the hostile first years of the twenty-first century.

However, over the next five to seven years, Finland needs to further develop the financing of young innovative companies to reflect current and new challenges, and to ensure the continuing effectiveness of the Finnish financing system across different stages of the economic cycle. The key recommendations, discussed in more detail in the body of the report, are:

- 1 **Ambitious goal.** Improve the ambition level in growth oriented enterprises and set a national goal to make Finland one of the most vibrant investment markets in the world for investing in and creating and capturing value from young innovative companies. This market should be privately led and provide clear incentives for professional investors as well as for the entrepreneurial owner-managers to invest in and create and capture value from young innovative companies.
- 2 **Clear signals of commitment.** Make a clear statement that high growth entrepreneurship and private risk taking is highly valued and rewarded in Finland. Use tax incentives to catalyze entrepreneurial activity and private investment and to reinforce this signal. Improve the coordination of the tax and legal environments and the provision of public financing in order to facilitate a more effective enterprise policy.
- 3 **Open and global approach.** Leverage all available financial and human resources to the nation's long term advantage regardless of their origin. Invite foreign investors and entrepreneurs to invest in young innovative companies in order to help commercialize rapidly and worldwide Finnish R&D outputs. Innovate new ways to create and capture value from Finnish R&D investments in global markets.
- 4 **Determined execution.** Remove duplication, fragmentation and unwarranted growth of public services. Improve inter-agency coordination and improve the customer orientation in the provision of public finance. Use the strengths of existing agencies to ensure the optimum delivery of public services. Major additions to public interventions by existing agencies should be fully justified and independently validated. The state's primary responsibility is to create the long-run conditions for the working of competitive and efficient markets. The purpose of public agencies addressing market failures is the correction of such problems and, where appropriate, the necessary interim provision of state support. The closer the activities of public agencies replicate the fully commercial operations of the private sector, the greater should be the need to justify the continuing allocation of public monies.

1 Introduction

The goal of this study was to examine the challenges and development opportunities in the public financing of young innovative companies over a relatively long time frame, i.e. from five to seven years. We were asked to develop recommendations for the Ministry of Trade and Industry and other stakeholders as to how support for the financing of young innovative companies might be developed in Finland. The central research problems, as defined by the Ministry of Trade and Industry, were:

- 1 To what extent does the large number of public finance organizations cause problems particularly in the development of young innovative companies? How could these problems be reduced or eliminated?
- 2 Is the division of labor between public finance organizations clear and appropriate? Is their collaboration coordinated sufficiently from the perspective of individual client companies, and how the coordination could be improved?
- 3 What problems does the limited availability of private finance/private financiers cause in the finance of young innovative companies? How could those problems be reduced, and how could the willingness of private investors to invest in young innovative companies be improved?
- 4 What conclusions can be drawn from the recent development trends in public finance of young innovative companies in comparable countries?
- 5 How is the financing of young innovative companies estimated to evolve over the next five to seven years, and how is this taken into account in the development recommendations?

In addressing the research questions we have leveraged both the scholarly literature related to the financing of young innovative companies as well as currently available evaluations and studies of the Finnish market. We have looked at similar evaluations of relevant public organizations in other comparable countries. We have carried out interviews with experienced individuals representing various stakeholder groups including entrepreneurs, advisors of entrepreneurs, venture capitalists, business angels, institutional investors, government funding organizations, and policy makers, and scholars in order to identify the challenges and development opportunities in the public finance of young innovative companies in Finland. In addition to information and views provided by more than 40 interview-

ees listed in the end of report (some of them by telephone or by email), we have been able to benefit from numerous discussions with other experts both informally and in various seminars, round tables and workshops held both in Finland and abroad.

The rest of the report is structured as follows. First, we briefly review relevant research. Thereafter, we provide a description of the funding of young innovative companies in Finland as well as the role of the public sector. Finally, we present our conclusions and recommendations.

2 The Role of Government in the Financing of Young Innovative Companies

Over the recent years, the literature on the role of government in the finance of young innovative companies has expanded considerably. The public policy challenges facing Finland are not unique. Helpfully for us, there is broad consensus in the literature on the key principles determining government support for young innovative companies. In this study, we reference more detailed research reviews but only provide a brief summary to give a basis for our analysis of the Finnish market and international experience.

2.1 Motivation

Governments are motivated to ensure the availability of finance for young innovative companies given their important role for the growth and renewal of modern economies. In particular, it is the small number of the nation's most growth-oriented companies that have a disproportionately high impact on employment growth.¹ These growth oriented young companies often require substantial amounts of external finance. This high risk finance is often not forthcoming from traditional bank sources and venture capitalists or business angels assume an important role. A functioning venture capital market has been shown to be a very important element of the economic infrastructure. Active, informed and experienced risk capitalists promote innovation and thereby assist the growth of employment and economic activity.²

However, markets do not always function effectively to produce automatically a socially optimum outcome. This is particularly the case for the market provision of sufficient risk finance demanded by growth oriented, innovative young companies

1 See e.g. Autio (2005), Autio et al (2000), Birch et al. (1997), Kirchoff (1994), and Storey (1994) for evidence of the bulk of employment growth coming from a very small share of the fastest growing new enterprises. This has very important implications to policies aiming to contribute to employment creation through supporting entrepreneurship (see e.g. Autio, 2005; Hyytinen & Rouvinen, 2005e; Pajarinen & Rouvinen, 2006a; Pajarinen, Rouvinen, & Ylä-Anttila, 2006b). Recent research suggests increasing skepticism towards policies focusing simply on quantity of new companies particularly in low enterprise areas (see e.g. Greene, Mole, & Storey, 2004; Van Stel & Storey, 2004)

2 (e.g. Achleitner & Klöckner, 2005; Alemany & Martí, 2005; Berg & Gottschalg, 2005; BVCA, 2001; Engel & Keilbach, 2002; EVCA, 2002; EVCA., 2001; Kortum & Lerner, 2000; Romain & van Pottelsberghe, 2004).

at the earliest stages of their development.³ Investors believe that the returns do not compensate fully for the risks incurred. In such situations, governments are frequently urged to intervene.

There are certain theory-based explanations why markets might not produce a socially optimal balance of supply and demand and why government intervention might be needed: spillovers (positive externalities), information asymmetries, and network externalities have each been cited as being important.⁴

Knowledge spillovers or positive externalities refer to the fact that young innovative companies and their investors may not be able to capture all, or a sufficiently attractive proportion, of the total benefits such ventures create for the wider economy and society. This may lead to underinvestment and provide a reason for government intervention.⁵

Information asymmetries refer to the ‘adverse selection’ and ‘moral hazard’ problems in choosing growth oriented young innovative companies.⁶ Lack of full information makes it hard for outside investors to evaluate the quality of the enterprises and to separate good ventures from bad ones. Unless good ventures can effectively signal their superiority, information asymmetries may hamper the functioning of the market and lead to underinvestment from society’s point of view. Venture capitalists use an expensive and time-consuming ‘due diligence’ process to assess the real value of prospective investments. Such due diligence costs are relatively insensitive to scale. It therefore becomes much more cost effective for investors to appraise more established companies with a known history and track record. This is one important reason why risk capital investors have moved away from seed and start up investments to later stage companies where better information is available and larger sums of money can be invested. Scale economies severely prejudice earliest stage ventures and their investors.⁷

3 (e.g. Cressy, 2002; Cressy & Olofsson, 1997; European Commission, 2005a, 2006c; Harding, Cowling, & Murray, 2003; Lerner, 1999; LTT-Tutkimus Oy, 2005; OECD, 2006; Paasivirta & Valtonen, 2004; Storey & Tether, 1998; Westhead & Storey, 1997)

4 For reviews, see e.g. Hyytinen and Väänänen (2003e), Lerner, Moore, & Shepherd (2005), and Murray (2007)

5 See e.g. Griliches (1992), Lerner (1999; 2002), Lerner et al. (2005), Hyytinen and Väänänen (2003e)

6 (Hyytinen & Väänänen, 2006; Lerner, 1999; Myers & Majluf, 1984)

7 (Murray & Marriott, 1998; Söderblom & Murray, 2006)

Network externalities relate to the nature of entrepreneurial finance and entrepreneurship in an economy.⁸ It is hard to build the first successful venture in an economy without access to experienced entrepreneurs, financiers, service providers and other stakeholders. The building of the required infrastructure takes time and is influenced by a positive feedback loop. Hence there is often a need for the government to “jump start” the venture capital industry and support directly the development of the professional infrastructure needed for an entrepreneurial, knowledge-based economy.⁹

As an additional consideration and a potential challenge in the globalizing venture capital market¹⁰ may have to do with home bias i.e. investment barriers that lead investors investing much more in domestic companies than what the portfolio theory would imply.¹¹ Several factors can cause the bias including taxation, cross-border transaction costs, hedging, agency-related costs such as control of the company, and culture and language. When domestic institutional investors increase their international diversification, the financial system should enable the general partners to raise increasingly funds from foreign investors. The role of local investors appears to be important in overcoming home biases and attracting foreign investments.¹²

2.2 Approaches

The key role of the government in growth-oriented entrepreneurship is unquestionably to provide a conducive framework and environment for informed and profitable risk taking by private investors.¹³ Growth oriented entrepreneurship simply cannot develop as a government driven and managed activity. Supportive

8 (See e.g. Lerner et al., 2005)

9 (Gilson, 2003; Lerner et al., 2005)

10 (Baygan & Freudenberg, 2000; Deloitte, 2006a; Heikkilä, 2004; Hursti & Maula, 2006b; Maula & Mäkelä, 2003b; Mäkelä & Maula, 2003)

11 For a discussion and empirical evidence on home bias in different markets, see e.g. Grinblatt and Keloharju (2001), Kang and Stulz (1997) and Stulz (1981). For a discussion of home bias in venture capital context, see Hursti and Maula (2006).

12 (Deloitte, 2006a; Mäkelä et al., 2003).

13 (Armour & Cumming, 2006; Bottazzi, Da Rin, & Hellmann, 2005; Cumming, Fleming, & Schwienbacher, 2006a; Cumming & MacIntosh, 2006b; Da Rin, Nicodano, & Sembenelli, 2006; Lerner et al., 2005; OECD, 1997, 2004; UK Presidency of the EU and the European Commission, 2005a)

government involvement should best be seen as an interim and temporary activity to allow the evolution of an informed and experienced private market.¹⁴

The primary role of the government's entrepreneurial focus should be to ensure that the tax and legal frameworks do not inhibit well functioning markets.¹⁵ In this role government supports improvements in the tax and legal environments, entrepreneurial culture, stock exchanges for growth companies, and other framework conditions that influence the supply and demand for both formal and informal venture capital.¹⁶ Of particular importance is the effective functioning of a range of exit markets available to investors.¹⁷ Without a means of liquidating both good and poor investments, early stage activity is highly unattractive to professional investors.

Secondarily, in the absence of sufficient private finance being forthcoming from commercial capital markets, the government can also intervene the markets by supplying risk capital.¹⁸ The state can invest directly in individual portfolio companies. Alternatively, the state can invest indirectly by contributing finance as a

14 The recent communication by the European Commission (2006c) states: "Public investment to compensate for market failure should as far as possible be at arm's length, so that investment decisions are solely driven by market discipline, and in partnership with the private sector."

15 An OECD report (1997) concludes: "...it must be recognised that, in many cases, direct government programmes are second-best solutions. The best approach is to enhance the macroeconomic and regulatory environment in order to overcome some of the financial obstacles to high-risk investments." See e.g. Armour and Cumming (2006), Bottazzi, Da Rin and Hellmann (2005), and Cumming, Fleming and Schwienbacher (2006a) for empirical evidence on the importance of tax and regulatory determinants on venture capital.

16 (Armour et al., 2006; Cumming et al., 2006a; European Commission, 2005a; Gilson, 2003; Hyytinen, Rouvinen, Toivanen, & Ylä-Anttila, 2003d; Mason & Harrison, 2001; Maula & Murray, 2003a; OECD, 1997; UK Presidency of the EU and the European Commission, 2005).

17 (Ali-Yrkkö, Hyytinen, & Liukkonen, 2003; Audretsch & Elston, 2006; Black & Gilson, 1998; Black & Gilson, 1999; Da Rin et al., 2006; European Commission, 2006c; EVCA, 2005; Gompers & Lerner, 1999; Jeng & Wells, 2000)

18 We want to emphasize the word secondarily. For instance, Da Rin et al. (2006) conclude based on their econometric analysis of the determinants of early stage venture capital: "...we believe our results have a clear message: sensible policy should consider a wider set of policies than simply channeling more funds into venture capital." More specifically, they conclude: "we find that policies which increase the expected return of innovative projects are more successful in altering the composition of venture capital markets towards early stage projects and projects in high-tech industries. A reduction in capital gains taxation raises the share of early stage and high-tech investments. The availability of stock markets targeted at entrepreneurial companies – which provide a lucrative exit channel – also has a positive effect on the innovation ratios, while a reduction in barriers to entrepreneurship leads to an increase in the high-tech ratio."

limited partner to one or more professional, venture capital funds.¹⁹ The clear consensus in the existing literature is that indirect intervention is preferred to direct intervention by the state.²⁰ For example, rather than civil servants selecting enterprises to be funded with tax payers' money, governments should create the necessary conditions and incentives for professional investors to emerge and fill the gap. Another important role could be for the state to help grow the overall demand for the products or services of these finance rationed companies.²¹ Direct investments by government agencies in ventures should be the last resort of the government.²² Even when pursuing direct interventions such as publicly provided capital, governments should employ and incentivize market actors rather than its civil servants to select commercially attractive companies.²³

Whatever the public intervention, research clearly suggests that governments should take a long term perspective. It is crucial to understand the simultaneity problem: both supply and demand should be addressed simultaneously with the

19 For reviews of policies created to facilitate the creation of new privately managed funds, (including incentive structures and bidding processes), Appendix 2.3 and prior studies, e.g. Gilson (2003), Maula and Murray (2003a), Jääskeläinen et al. (2004), Cumming (2006), and Avnimelech and Teubal (2006) among others. For a recent model, see Enterprise Capital Funds model in the UK which resulted in 45 bids from prospective general partner teams in 2005 (“£40 million Enterprise Capital Funds announced”, Small Business Service Press release on May 22, 2006).

20 (Armour et al., 2006; Bannock Consulting Ltd., 2001; European Commission, 2005a, 2006c; Florida & Smith, 1993; Gilson, 2003; Karsai, 2004; Manigart & Beuselinck, 2001; Maula et al., 2003a; Modena, 2002; Murray, 2007; OECD, 1997, 2004; Teubal & Luukkonen, 2006; United States Department of Commerce and European Commission, 2005)

21 (Aho, Cornu, Georghiou, & Subirá, 2006; Georghiou, Smith, Toivanen, & Ylä-Anttila, 2003; Science and Technology Policy Council, 2006; Virtanen & Lipponen, 2006)

22 For instance, an OECD report (1997) recommends: “A successful programme will elicit private sector participation in the design stage and will look to the private sector to play a professional role in the programme’s management. While the government should monitor programmes, its involvement in investment decisions should be minimal.” Similarly, Gilson (2003) concludes: “...government programs are commonplace in countries seeking to develop a venture capital market. Most such programs, however, have been unsuccessful. The reason, I will suggest, is that most government programs have tried to deal with the simultaneity problem by having the government both provide capital and act as the financial intermediary. Programs structured in this fashion fail because the government cannot respond to the trio of contracting problems inherent in early stage, high technology financing. Rather, a specialized financial intermediary is a necessary ingredient for which the government is not a substitute.”

23 See Hirsch (2006) for a recent theoretical analysis showing the superiority ex post grants (i.e. tax breaks) over other types of government support measures for venture capital. See also Da Rin, Nicodano and Sembenelli (2006), Gompers and Lerner (1998), Poterba (1989a; 1989b), and Jeng et al. (2000) for empirical evidence on capital gains tax reductions stimulating venture capital.

understanding of proper intermediation mechanisms.²⁴ Government must be mindful to not distort the functioning of the extant capital market and substitute for (i.e. ‘crowd out’) private actors.²⁵ Government should listen to commercial investors and the market’s participants very carefully in order to best correct identified market failures.²⁶ Furthermore, prior to any intervention, government should have a plan as to how their involvement will be phased out the clearly specified goal has been reached.²⁷ Accordingly, government venture capital programs should be evaluated periodically. An important criterion for measuring program success is the extent to which venture capital funds or small firms are created which can operate on a commercial basis independent of any direct state involvement, i.e. generate an attractive, risk adjusted, rate of return.²⁸

2.3 International Experience

In addition to surveying the literature on the effective government intervention in the finance of young innovative companies, we also reviewed briefly government interventions in selected countries. References included Sweden and Denmark (as close comparable countries in the Nordic region); Ireland, Israel and New Zealand (as other small open economies); and the UK and USA (as the two largest markets with most experienced venture capital and private equity industries). In addition, we also reviewed the use of some popular policy instruments in contemporary usage such as government sponsored venture capital funds, business angel co-investment funds, research commercialization funding, business angel tax incentives, and support for business angel networks in several countries (See Appendix).

24 In a very useful review of the venture capital contracting mechanisms and the related engineering problems Gilson (2003) summarizes: “...replicating the U.S. venture capital contracting structure confronts a daunting simultaneity problem. Three central inputs are necessary to the engineering process: capital, specialized financial intermediaries, and entrepreneurs. The problem is that each of these inputs will emerge if the other two are present, but none will emerge in isolation of the others.” See also OECD (2004).

25 OECD (2004) notes: “Over time, public programmes tend to converge towards the same market segments as the private sector rather than addressing gaps in the provision of risk capital. This could “crowd out” private investors and even delay the development of early-stage financing, especially if the market is limited.” See Armour and Cumming (2006) for empirical evidence on the crowding effect in a sample of 15 countries over a period of 14 years.

26 For instance, an OECD report (1997) recommends “Venture capital programmes should seek to stimulate private sector investment and create a commercially viable market.” See also e.g. Georghiou et al. (2003).

27 OECD (2004) states: “Government equity programmes can pump-prime private venture financing, but should be phased out when private markets mature.”

28 (OECD, 1997)

Overall, from the review of comparable countries, it can be clearly observed that countries have learned both from their own experience and other nations how to design (and not design) policies that catalyze the growth of efficient capital markets. For instance, considering government sponsored venture capital programs, Israel learned from its unsuccessful Inbal program and designed a completely different Yozma program with a clear focus on creating a competitive venture capital industry in Israel. Critically, it designed simple and attractive incentives for private investors and directly invited experienced foreign investors to Israel in order to achieve its developmental goals.²⁹ The new design was successful. In many countries such as New Zealand, newer programs have adopted a similar design.³⁰ Overall, it appears that experience has resulted in many countries coming to rely more on private actors (both funds and angel investors). Such countries have designed policies that more effectively harness private resources instead of creating government operated investment activities.

Concerning the governance of government policies and operations, there is again considerable variation between countries. For instance in Sweden, there are many agencies which more or less overlap with each other depending on the development stage of the target companies. In UK, Israel, Ireland, and USA, there is perhaps somewhat clearer coordination via one primary agency.³¹ There are also differences between countries in how well integrated issues related to tax and regulatory environment are dovetailed with government support activities for the finance of young innovative companies. For instance in UK, the Small Business Service and HM Treasury have had deep collaboration with joint reports and strategies and a balanced portfolio of policy instruments including both direct support measures as well as tax incentives. However, the full integration and consistency of support arrangements for young innovative companies is highly challenging given that government measures and programs from virtually every department of state will have some effect (good or bad) on the operations of such companies.

Concerning specific program instruments, we reviewed the use of government sponsored venture capital funds, business angel co-investment funds, research commercialization funding, business angel tax incentives, and support for business angel networks in several countries.

29 See e.g. Teubal and Luukkonen (2006) and Avnimelech and Teubal (2006).

30 The architect of the Yozma program was invited to New Zealand as a consultant.

31 Small Business Service under the Department of Trade and Industry in UK, Chief Scientist's Office in Israel, Small Business Administration in the USA, Enterprise Ireland in Ireland, and New Zealand Venture Investment Fund Limited under the Government of New Zealand.

In the case of government sponsored venture capital funds, some of the key lessons are that the role of government in VC is usually seen to be to help jump start the market. This is done by enabling professional new management teams to enter the market through well designed programs involving a bidding process and professional due diligence. The existence of a professional (and ideally independent³²) selection process provides some certification that helps then the teams raise the rest of the funding from private markets. *Pari passu*³³ principle may be a default option for supplying capital, but it is not very effective in catalyzing new funds in market failure areas in which institutional investors are not willing to invest. Therefore, many governments have started to employ more advanced programs to facilitate the entry of new professional management teams to invest in market failure areas.³⁴

Concerning research commercialization funding, lessons learned are that the schemes should be easy to access with rapid decision making. Furthermore, they ideally should provide some certification effects and thereby facilitate access to further finance from other (private sources) after the proof of the concept.

Concerning business angel co-investment funds, lessons learned are less categorical given the novelty of the programs and lack of accumulated evidence on the consequent development of portfolio companies. Co-investment programs seem to be valuable in catalyzing business angel investment and in helping angels and angel syndicates with limited resources to make bigger deals in an environment where scale economies are important.

Concerning government support for business angel networks, one lesson is that that a critical role of business angel networks is to assist in the professional learning of essentially professionally inexperienced risk capital investors. These schemes are unlikely to take off without direct government financial support for set up and early administration costs. The government's role is supposed to reduce as the network develops and gains sufficient scale and autonomy to become self fi-

32 The UK government hired specialist consultants to provide a selection methodology in order to select the general partners for their government supported VC programs. Similarly in New Zealand (NZVIF) and Belgium (ARKimedes), external professional private equity consultants are used in the due diligence and selection.

33 I.e. all shareholders have the same rights and privileges for any distributions related to their stock holdings in the business.

34 The examples of programs based upside incentives for investors and fund managers of funds focused on market failures using open bidding processes and professional due diligence include Israeli Yozma (assessed e.g. by Avnimelech et al., 2006), Industry Innovation Investment Funds program in Australia (assessed e.g. by Cumming, 2006), New Zealand Venture Investment Fund program (assessed e.g. by Lerner et al., 2005), and most recently Enterprise Capital Funds program in the United Kingdom.

nancing. Experience would suggest that the networks take several years to reach self-financing. Scale continues to be an important influence on the business angel network's income given that it is often generated from both members' fees and success fees from arranged investment rounds.

Concerning business angel tax incentives, some of the key lessons are that they are seen as an important catalyst of business angel activity particularly when complemented by professional training and network development for angel groups. The experiences and few existing evaluations are quite positive for well designed schemes. The main criticisms and problems in unsuccessful schemes have been too broad targeting reducing the effectiveness and cost-efficiency, and excessive complexity or too tight constraints reducing their use. Based on experience, ex ante tax credits are seen to be most effective in catalyzing new investors. However, evaluations have shown that an exemption of a capital gains tax after a three year holding period appears to be nearly of equal value for investors.³⁵ Capital gains relief is more likely to incentivize more professional or experienced private investors. In Finland there are currently no tax incentives for business angels, but such incentives have been recently proposed. Their potential role has been considered in many studies and reports.³⁶

35 (Boyns, Cox, Spiers, & Hughes, 2003b)

36 (e.g. Grönholm, 2006; Hyytinen & Pajarinen, 2003b; Hyytinen et al., 2005e; Hyytinen et al., 2003d; Kari, 2005; Kauppa- ja teollisuusministeriö, 2004; Lahti, 2004, Forthcoming; Maula, Autio, & Arenius, 2005; Maula et al., 2006a; Maula, 2007; Ministry of Finance, 2005; Niemi, 2003; Paasivirta et al., 2004; Science and Technology Policy Council, 2006; Sitra, 2005; Valtioneuvoston kanslia, 2004, 2006; Virtanen et al., 2006)

3 Financing of Young Innovative Companies in Finland

3.1 Market Analysis

3.1.1 Financing Needs of Young Innovative Companies

In Finland there were 236 435 companies in 2005, of which 220 184 (93.1%) were micro-companies with less than 10 employees, 13 352 (5.6%) small companies with 10–49 employees, 2320 (1.0%) medium sized with 50–249 employees, and 579 (0.2%) large companies with 250 or more employees.³⁷ According to the EU commission SME definition 227 900 were small companies, 3 200 medium sized and 4 500 large. According to the latest SME survey in the fall 2006,³⁸ 23% of Finnish SMEs will seek external finance within the next 12 months. Of these, 84% will approach banks, 31% Finnvera, 11% venture capitalists, 5% insurance companies, and 15% other sources. However, there are important differences in the financing needs of companies depending on their growth orientation. For strongly growth oriented companies, the share of companies seeking external finance is 40%. This figure is nearly twice as large as for SMEs in general. Fewer strongly growth oriented companies will approach banks (65%) but a significantly higher share of these companies seeking external finance will approach Finnvera (46%), 30% venture capitalists, 6% insurance companies, and 23% other sources. The financing needs and behavior of high growth young innovative companies are different from the average SME. This reality needs to be clearly recognized in schemes targeting high potential YICs.

37 Statistics Finland (<http://statfin.stat.fi/statweb/start.asp?LA=fi&DM=SLFI&lp=catalog&clg=yrytkset>)

38 (Finnvera and the Federation of Finnish Enterprises, 2006)

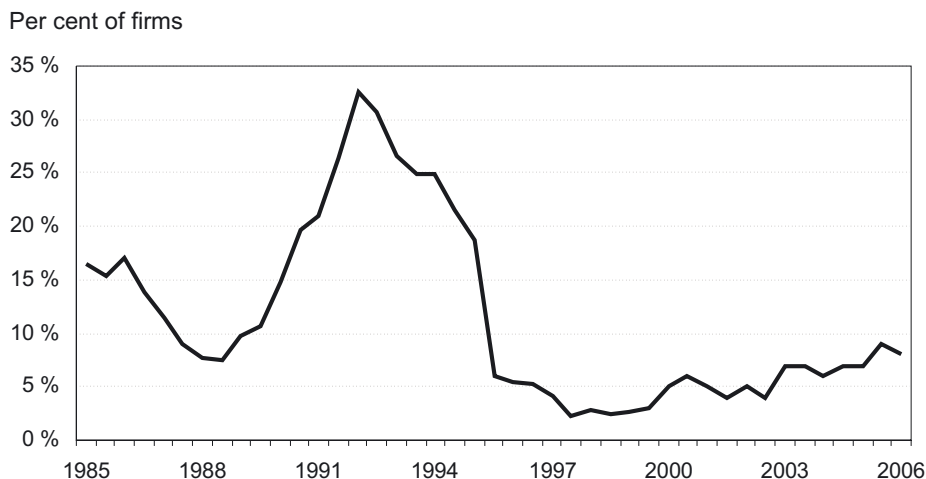


Figure 1. The share of SMEs reporting the lack of finance as the most serious obstacle to developing their company in 1985–2006³⁹

Overall, most Finnish SMEs do not have problems in accessing finance (see Figure 1).⁴⁰ This appears to be the case in all regions of Finland – the differences in the perceived difficulties in accessing finance between regions are relatively small.⁴¹ Young age increases the cost of capital, but alone should not prevent access to finance.⁴² Not even many young innovative companies have currently problems in getting finance.⁴³ The majority of companies do not even need external finance because they do not pursue growth.⁴⁴ However, those young innovative companies

39 Based on data collected in the bi-annual barometer of Finnvera and the Federation of Finnish Enterprises, August 2006. Information kindly provided by Finnvera and the Federation of Finnish Enterprises. No indicator for the innovativeness or R&D expenditure was available to enable analysis of the financing situation of “young innovative companies”. N=831. The number of responding companies in the group planning to close operations within the next year was only seven.

40 Also the financing survey 2005 of non-financial corporations of Bank of Finland and Ministry of Trade and Industry (2006) finds that only some 3% of those companies who had obtained or applied for financing had encountered problems in availability.

41 (Finnvera and the Federation of Finnish Enterprises, 2006)

42 (Hyytinen & Pajarinen, 2007)

43 (Pajarinen, Rouvinen, & Ylä-Anttila, 2006c)

44 (Finnvera and the Federation of Finnish Enterprises, 2006)

who are most growth oriented are more likely to experience problems.⁴⁵ This characteristic of a relatively small proportion of high potential firms being those firms which are most disadvantaged by current capital market provisions is not unique to Finland.⁴⁶ Therefore, we focus primarily on this segment of growth-oriented young innovative companies in this report.

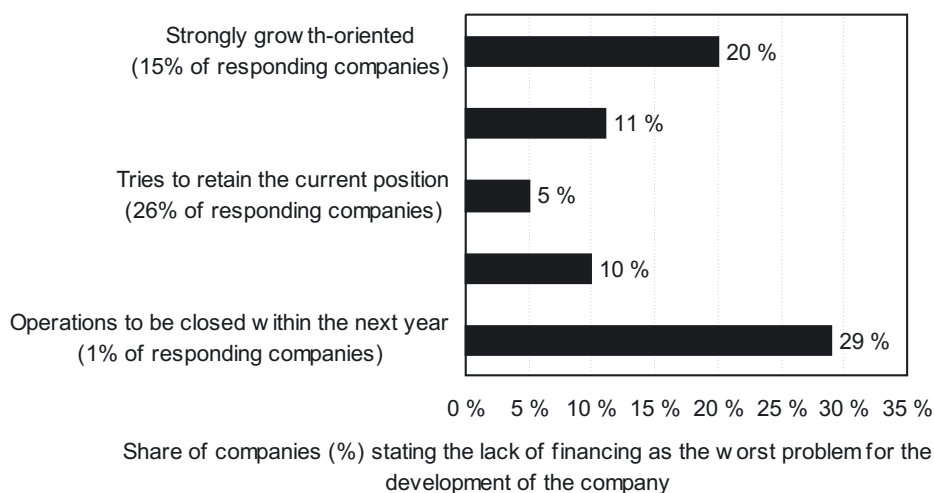


Figure 2. The share of small young companies (less than 50 employees and established between 2001–2006) reporting the lack of finance as the most serious obstacle to developing their company⁴⁷

Despite of the overall financing situation of young innovative companies being relatively good, the interviewees and statistics identify a clear challenge in helping

45 (Hyytinen & Pajarinen, 2005d; Hyytinen et al., 2003e; Kari, 2005). Hyytinen, Rouvinen, Toivanen and Ylä-Anttila (2003d) conclude: "...our empirical findings that the growth-oriented and innovative subsegments within the SME sector are held back by financial constraints. It therefore seems warranted to conclude that Finland would above all benefit from having a continuum of strong markets for external equity capital. In particular, the Finnish economy would benefit from having i) more risk capital available for seed stage firms, ii) a more mature venture capital industry, iii) and a stronger stock market for growth companies."

46 For example, comparable difficulties for a minority young growth companies are also recorded in several other countries including the UK (Small Business Service, 2004c).

47 Based on data collected in the bi-annual barometer of Finnvera and the Federation of Finnish Enterprises, August 2006. Information kindly provided by Finnvera and the Federation of Finnish Enterprises. No indicator for the innovativeness or R&D expenditure was available to enable analysis of the financing situation of "young innovative companies". N=831. The number of responding companies in the group planning to close operations within the next year was only seven.

catalyze and finance large and ambitious startup companies aiming at challenging global markets.⁴⁸ There are currently few sources of sufficient value-adding risk capital for these growth-oriented and internationally focused ventures particularly at the first rounds of external finance.⁴⁹ In fact, very few Finnish companies have received significant external investments in the seed, startup or other early stage during recent years. According to FVCA data, only 7 seed, startup, or other early stage ventures received initial investments of €2m or more in 2004–2005.⁵⁰

There are quite clear sector differences in both the need and sourcing of support for early stage firms. For example, in the information and communications technology sector (ICT) business ideas leading to new enterprises very frequently come from prior work experience.⁵¹ In contrast, new product and process opportunities in bio-technology are much more likely to stem from academic research. Accordingly, Bio is often more dependent on public funding than ICT.⁵² In ICT, including software enterprises, ‘bootstrapping’ the start-up of a new venture is often a popular strategy given that the new enterprise may well require little or no external funding, particularly if it is not growth oriented.⁵³ However, for growth-oriented companies, major and rapid investments in product development and subsequent commercialization are needed. These expenditures can be substantial and often require sizeable external involvement. Such risky investments are more likely to be via equity type arrangements than from bank debt. Given the network externalities in many ICT sectors, many successful ventures in the US market receive tens of

48 Research on growth-oriented ventures shows that experienced founders and a large startup size are common characteristics of rapidly growing and successful ventures, see e.g. Burgel, Fier, Licht, & Murray (2004) Kaplan, Sensoy, & Strömberg (2005), and Pajarinen, Rouvinen, & Ylä-Anttila (2006b).

49 This was probably the clearest conclusion from interviews and is fully in line with the view presented in many recent evaluations (e.g. Brännback, Jalkanen, Kurkela, & Soppi, 2004; Hyytinen et al., 2003d; Kari, 2005; Lassila et al., 2006; LTT-Tutkimus Oy, 2005; Luukkonen & Maunula, 2006; Maula et al., 2006a; Maula et al., 2003a; Paasivirta et al., 2004).

50 Based on public sources, examples of larger investment rounds in early stage companies include €3m investment in Codenomicon in 2005 by Eqvitec Partners Oy and Prime Technology Ventures NV in 2005 and total €4.5m investments in Ipsat Therapies Oy in 2005–2006 by Bio Fund Management Oy, Finnish Industry Investment, Sitra and others. Both of these were started already earlier with smaller investments. Perhaps the biggest recent startup Blyk by Finnish founders was established in London with investments from private individuals and the Sofinnova Partners without funding from Finnish venture capital firms. Another recent big startup Igglo was established in 2005 again with funding from individuals and Taivas group with €12.5m expansion capital in 2006 from Benchmark Capital Europe (€10m) and Taivas Group (€2.5m) again without funding from Finnish VC firms.

51 (Kaplan et al., 2005)

52 (Hermans & Tahvanainen, 2002; Tahvanainen, 2003)

53 (Harrison, Mason, & Girling, 2004; Hyytinen & Pajarinen, 2005b; Lassila et al., 2006)

millions dollars of VC investment in a time span of a few years before breaking even, making an IPO or being acquired. Emerging technological advances in bio-technology, nano-technology and new materials will all require substantial and long term financing for both product and market development.⁵⁴ Given the expressed preferences of the Finnish and European venture capital industries, it is unlikely that such investments will occur in young and unproven enterprises without substantial and patient public support provided through the public innovation system.

To accurately assess the demand for financing need of young innovative companies, it would be very useful to have clear indicators of their number and financing needs. Unfortunately, such numbers do not currently exist. The currently available numbers are just estimates based on various assumptions. In 2005, the Statistics of Finland registered 26 543 new companies, of which only about 60% is likely to have started business operations.⁵⁵ Of these, depending on measure, about 7–40% claim to be growth oriented resulting in a range of about 1 000–6 000 new companies per year with some level of growth intent. Tekes has earlier estimated that there would be annually about 100–500 new growth companies established in Finland with an assumption that 1–5% of new companies would be growth companies.⁵⁶ Between 2003–2006, about 300 companies 6 years or younger have received finance from Tekes each year.

In the most recent SME barometer, the share of SMEs established 2001 or later was 24%. According to the Statistics Finland, the total number of SMEs in Finland was 227 900.⁵⁷ The number of SMEs six years old or younger would then be around 55 000. Whereas the overall share of “strongly growth oriented” SMEs in the barometer was 10% in fall 2006 (up from the low 6% between fall 2002 – fall 2003), the corresponding share within a subset of companies established 2001 or later with maximum 49 employees was 15%. The number of strongly growth oriented SMEs would then be most likely in the range of 5 500–8 000. To estimate the number of young innovative companies i.e. companies less than 6 years and inno-

54 (Brännback et al., 2004)

55 For an analysis of the share of new, activated entrepreneur-driven companies, see Pajarinen and Rouvinen and Ylä-Anttila (2006b).

56 (Hyvärinen & Rautiainen, 2006)

57 http://www.stat.fi/til/syr/2005/syr_2005_2006-11-30_kat_001.html

vation goals or R&D min 15% of total expenditure, many additional assumptions would be needed.⁵⁸

Concerning the deal flow of early stage companies to early stage venture capital firms, recent research based on number of unique companies in the deal flow lists of early stage VCs and several alternative methods suggests that there have been 800 to 900 different Finnish companies attempting to raise early-stage venture capital each year in 2004–2005.⁵⁹ Including firms seeking Tekes startup equity loans, the number would increase up to 1 000 companies per year.

In matching annual supply and demand, the different companies seeking venture capital investments in 2004–2005 identified in the study can be compared to the reality of 97 completed early stage VC investments recorded by the Finnish Venture Capital Association. Thus, the market-level success rate for an early stage venture capital applicant is 5.7%.⁶⁰ Figure 3 shows the wide discrepancy between firms seeking funds and those actually funded by Finnish venture capitalists in 2004–2005.⁶¹

58 Statistics Finland collects information on the overall number of companies, but does not have an indicator for innovativeness. The bi-annual SME barometer of Finnvera and the Federation of Finnish Enterprises (2006) similarly collects useful information, but has not so far separated YICs. The same applies to the financing survey of non-financial corporations of the Bank of Finland and the Ministry of Trade and Industry (2006). Measurement of the number, growth-orientation, realized growth, and financing needs of YICs based on the “young innovative enterprise” definition in the new EU state aid regulation (i.e. small enterprise 6 years or younger with goal to create a significant innovation or min 15% expenditures dedicated to R&D (European Commission, 2006a)) would be a useful addition in the statistics.

59 (Tiainen, 2006) These numbers refer to seed, startup and other early stage ventures sought from Finnish VC funds focused on investments in companies in these development stages. The estimate excludes funding sought from expansion and later stage investors as well as from buyout investors.

60 When interpreting these statistics, it is important to understand the difference between market level vs. firm level deal flow statistics i.e. the overall market (overlaps eliminated) vs. what individual VC firms see. For instance, if in a market of 100 deals each were shown on average to 2 VCs, and if 10 companies received investments, the firm level investment rate would be $10/100 \cdot 2 = 5\%$ and the market level investment rate would be $10/100 = 10\%$.

61 Again, this pattern is replicated in virtually every national VC industry’s statistics.

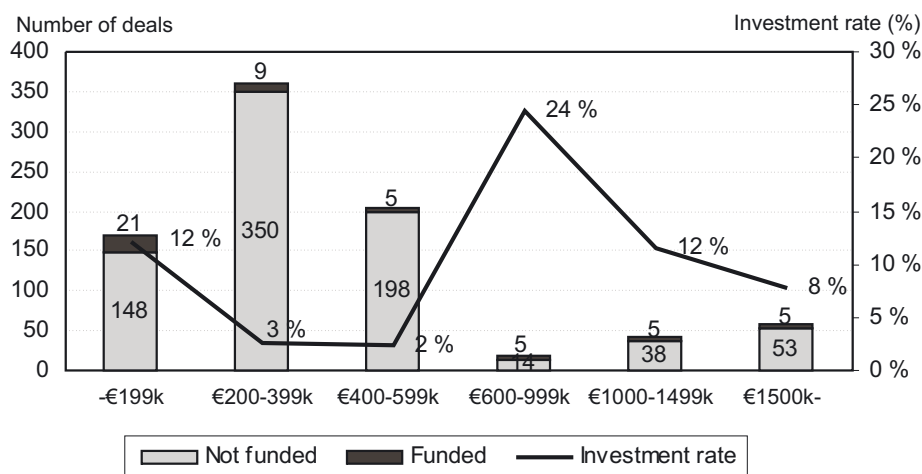


Figure 3. Market-level early stage venture capital deal flow and realized investment rounds by round size (averages 2004–2005)⁶²

As shown in Figure 3, the greatest demand for early stage VC, measured in numbers of companies, focuses on very small investment rounds below €600k. This analysis also suggests that small investments between €200–600k are the most challenging to receive given the penal effects of small scale on the VC fund.⁶³ In the smallest end of the scale, below €200k, Tekes startup loans that are not included in these figures further improve the chances of getting finance. However, above €600k level, both the volume of deal flow and the number of financed VC investments are small.

The low level of growth ambition by a large share of entrepreneurs reflected in the small amounts of finance sought and the lack of investments (and availability of investors that make such investments) appear to create a ‘chicken and egg problem’ that hinders growth oriented entrepreneurship in Finland. Recent examples also suggest that the introduction of new investors into a market can also stimulate further demand side activity from entrepreneurs thereby increasing the ‘size of the pie’. The more unique the fund’s focus and the greater the expected value-added support to the growth and internationalization of the portfolio companies of the new fund, the greater the new deal flow generated.

62 (Tiainen, 2006) Concerning these figures, it is very important to understand that they measure the deal flow of such Finnish VC funds that are focused on early stage venture capital. The figures do not contain the deal flow of larger growth and later stage focused VCs.

63 (Murray et al., 1998)

Venture Capital Investment

Figure 4 and Figure 5 illustrate the relative number of companies receiving VC funding, the average VC investment size, and the volume of the early stage venture capital investment as a percentage of GDP in selected countries. In this comparison Israel excels significantly above others with early-stage venture capital investments corresponding to 0.45% of GDP. In Israel, the overall high-tech venture capital investments totaled \$1.34bn in 2005 and are estimated to total \$1.5bn in 2006,⁶⁴ corresponding to about 1.0% of GDP. This figure is way beyond Finnish activity where €89m early-stage VC (0.06% of GDP) or €187m total VC (0.12% of GDP).⁶⁵ In R&D, Finland has been continuously among the top countries with R&D expenditure of 3.5% of GDP just behind Israel (4.7% of GDP) and Sweden (3.8%) in 2005.⁶⁶ Finland's goal is to raise R&D expenditure to 4.0% by the end of this decade.⁶⁷ The ambition and focus on investments in the commercialization of R&D has unfortunately been much lower.⁶⁸

64 Source: IVC Research Center

65 Source: FVCA 2006

66 However, it needs to be remembered that a large share of the Finnish R&D expenditure is based on Nokia. According to recent estimates, Nokia accounts for 45% of the total business sector R&D and a third of total national R&D (Hyytinen, Pajja, Rouvinen, & Ylä-Anttila, 2005a). It is difficult to assess the relative role such R&D creating opportunities for the creation of venture capital backed companies compared to other R&D. During the recent years, many of the most visible ventures have been spin-offs from Nokia, founded or lead by former Nokia employees, or operating in closely related business areas.

67 (Prime Minister's Office, 2006; Science and Technology Policy Council, 2006)

68 The Science and Technology Policy Council (2006) notes: "Different development stages of companies and the associated different financing needs have not been sufficiently considered. Innovation finance and the functioning of financing instruments as a whole have not received enough attention by the Science and Technology Policy Council (authors' translation)."

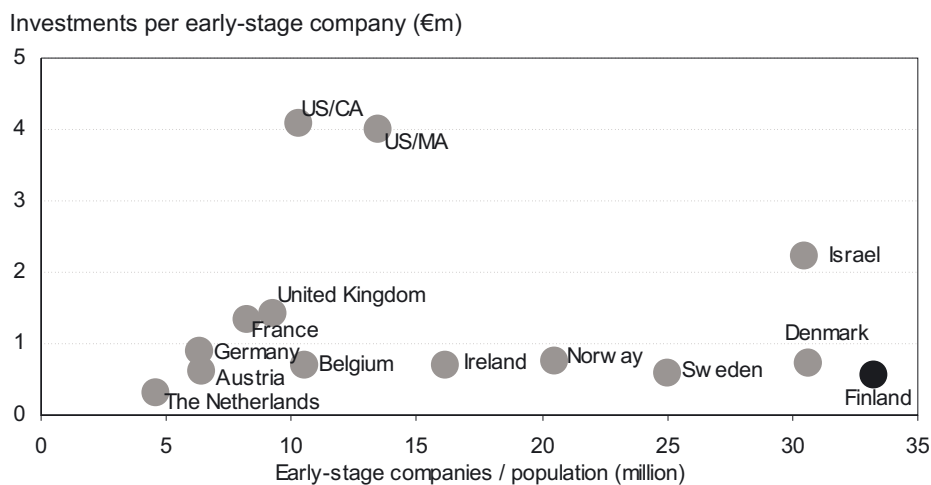


Figure 4. Average number of VC-funded early stage companies and investment size 2001–2005 in selected countries and regions⁶⁹

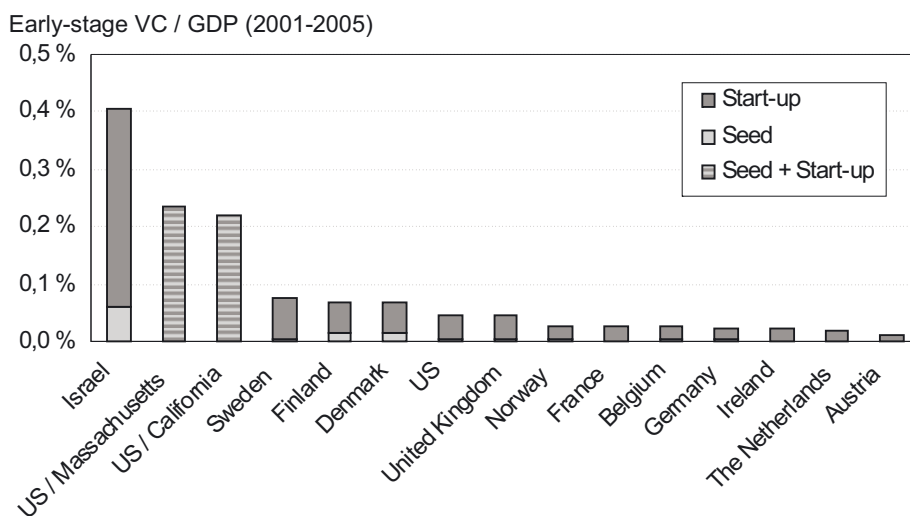


Figure 5. Early-stage venture capital investments as a percentage of GDP in selected countries and regions⁷⁰

⁶⁹ Sources: IVC, EVCA, FVCA and VentureXpert. The figures should be considered as illustrative given potential differences in the definitions in different regions and databases.

⁷⁰ Sources: IVC, EVCA, FVCA and VentureXpert. The figures should be considered as illustrative given potential differences in the definitions in different regions and databases.

In Finland, the number of venture capital funds that invested in seed, startup, and other early stage ventures dropped significantly from 2001 to 2003. Finnish experience reflected a major worldwide reduction in technology-based investment post 2000. After the low point in 2003, early stage VC investment has started to grow again in Finland and most of the other countries (Figure 6). Figure 7 also illustrates the market dynamics by showing how the number of initial investments dropped from 271 in year 2000 down to 127 in 2003. After 2003, slow recovery has started.

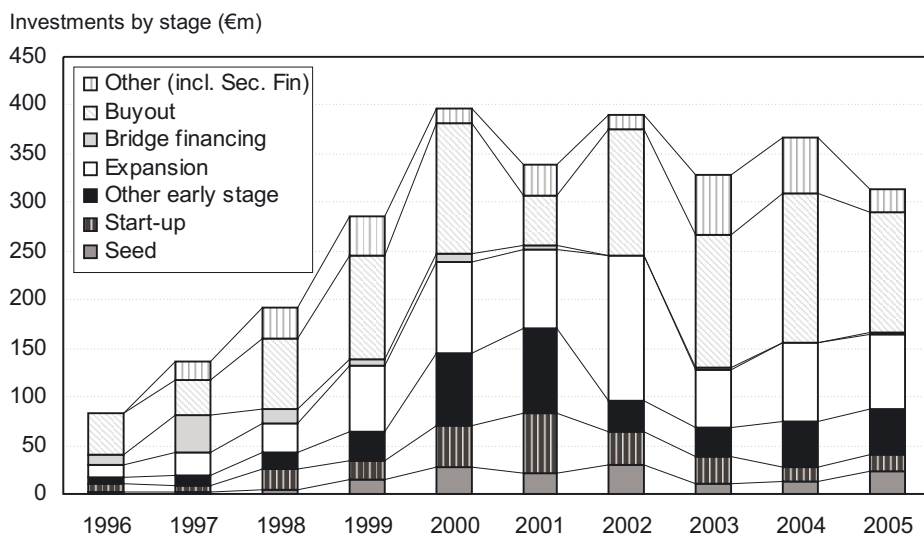


Figure 6. Venture capital and private equity investments by stage in Finland 1996–2005⁷¹

71 FVCA statistics and yearbooks 1990–2005. When considering the volume of VC investments in Finnish ventures, it is important to understand that the country-of-management based figures are increasingly irrelevant as the share of foreign VC investments in companies increases (OECD 2000). In 1999, 43% of investments in Finnish companies were foreign (2000). In 2006, many of the largest VC deals in Finland have been cross-border investments e.g. €12.8m round in Ekahau including 3M with Nexit Ventures and others, €12.5m round in Igglo led by Benchmark Capital Europe, an undisclosed large round led by Sofinnova Partners in Blyk, \$7.7m round in Silecs backed by Kleiner, Perkins, Caufield & Byers, a €4M round in Solid by Apax Partners and CapMan, among others.

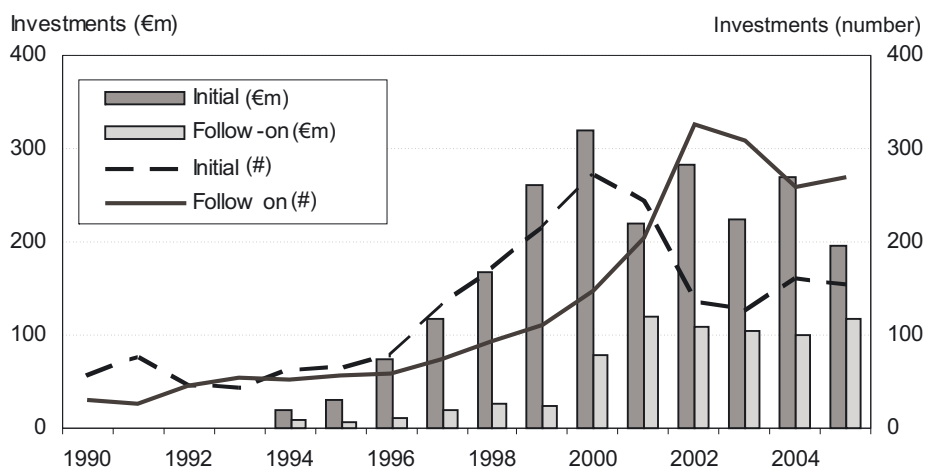


Figure 7. Initial and follow on investments in venture capital and private equity in Finland 1990–2005⁷²

In Finland the mild upturn in early stage finance since 2003 was largely the result of strong government support via the new Seed Finance program of Finnish Industry Investment (FII) (since 2004) and Seed Fund Vera Ltd (since 2005, hereafter ‘Avera’). The share of private investors in all early stage investments has dropped from above 60% in 2000 to around 30% 2005. Most of the public early-stage investments were made by Sitra and Sitra-owned regional funds until around 2002 and recently by FII and Avera (Figure 8).

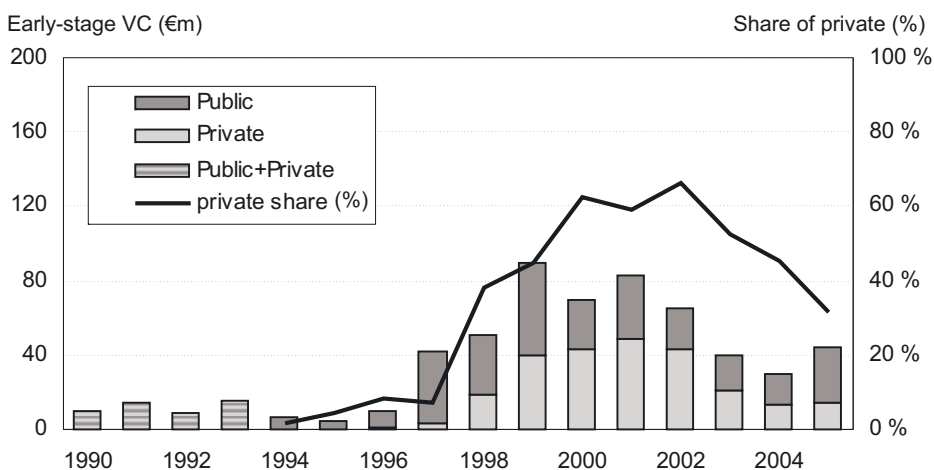


Figure 8. Seed- and start-up stage venture capital investments by private and public investors.⁷³

Concerning business angels, Sitra's INTRO market place has currently 450 registered business angels in comparison to 100 angels in Sitra's Matching-service ten years ago in 1996. The volumes of business angel investment are hard to estimate. However, according to Global Entrepreneurship Monitor which measures informal venture capital (a broader concept than professional business angels), the volume of informal venture capital as a percentage of GDP in Finland was among the lowest of the participating countries in 2005.⁷⁴

3.1.3 Venture Capital Firms

The Finnish Venture Capital Association has currently 42 'full' (i.e. investor) members of which 15 have announced their willingness to invest in seed stage ventures and a total of 21 (including the 15 seed firms) are prepared to invest in startup ventures. In addition, ten other Finnish VC firms have not set stage-related investment criteria.⁷⁵ Very few of these investors have above €50m under management. One major consequence of this small fund structure is that their ability to scale companies rapidly to international growth is very limited. Very few of those VC

73 FVCA statistics

74 (Minniti, Bygrave, & Autio, 2006)

75 However, only two of these firms are known to invest in seed or startup stages.

firms with fund sizes above €50m have made initial investments in early stage companies in 2006. This is because remaining funds have been reserved for follow-on investments or changes in the funds' investment strategies have moved them towards a preferred focus on later stage deals.⁷⁶ Only four Finnish VC investors (three of them public) with managed capital greater than €50m made initial investments in Finnish seed or startup stage companies in 2006.

There are very significant entry barriers to venture capital, largely given the reluctance of institutional investors to back first-time funds.⁷⁷ Many of the key institutional investors in Finland do not currently consider European or Finnish VC funds attractive in general. They are categorically negative about first time funds. Many of the current private VC firms have been established as spin-offs/management buyouts from public investors e.g. Eqvitec Partners (Ex-Sitra Technology Management), Biofund Management (ex-Sitra Biofund Management), 3i Finland (ex SFK Finance Oy, ex-Startfund of Kera Management) and most of the currently primarily privately owned regionally operating venture capital funds came about as management buyouts from Sitra (e.g. Aboa Venture Management, Innofinance, Midinvest, Sentio Invest, Teknia Invest, Teknoventure Management, among others).

While it is important that new general partners emerge in a competitive environment, it may not be optimal if the only route to create sufficiently large funds is by employees of public organizations privatizing public VC programs through MBOs to become venture capitalists. For instance, few world-class serial entrepreneurs work in public funding organizations. The insider nature of these transactions has reduced the opportunity of non public servants to engage in Finnish risk capital activity. Yet, it is exactly the experience of world-scale serial entrepreneurs that is urgently needed in Finnish early stage ventures. To the outside observer the Finnish venture capital structure looks a rather tightly knit network of former civil servants. This is a very different structure and character to that pertaining in early stage VC funds in either Israel or the USA. Several countries have launched government backed programs based on incentives and open bidding to catalyze new professional private venture capital funds.⁷⁸

76 Dimov & Murray (2007) show that, in the US, larger VC funds continue to invest in seed capital activity as a means of new technology market intelligence.

77 In Europe institutional investors are more reluctant to invest in first time funds compared to other regions with only 35% of LPs definitely investing and additional 8% considering whereas the figures are 49% and 6% for the USA and 54% and 11% for Asia (Private Equity Intelligence Ltd, 2006). Based on interviews, the situation in Finland appears to be even worse for initial funds than in Europe in general.

78 See chapter 2 and Appendix 1 for reviews of programs such as New Zealand venture Investment Fund, Israeli Yozma, Australian Innovation Investment Funds, and the British Enterprise Capital Funds.

3.1.4 Institutional Investors

One of the constraining factors in the development of private funding of young innovative companies is the availability of institutional funds to privately managed, venture capital funds. In Finland, as in many other countries, large pension funds are one of the core sources of funds in venture capital and private equity.⁷⁹ In Finland, pension funds are quite new to this asset class. In particular, they first invested significantly in domestic early stage venture capital in 1998–2001, just before a major crash of the technology market. This led to worse than expected returns and scared away new investors that had burnt their fingers in the first round of VC funds in which they invested. Since then, very little finance has been invested by institutional investors in venture capital funds focused on early-stage ventures (see Figure 9).

⁷⁹ In Finland, the most important sources of funds of venture capital and private equity funds in 2005 were pension funds (31%) followed by fund of funds (14%), capital markets (14%), insurance companies (12%), corporate investors (10%), government (9%), banks (5%), private individuals (3), academic institutions (1), and other sources (3%). Given the dominant role of pension funds as investors, and their currently very low interest in early and growth stage venture capital funds (opposite to buyout funds), the government has had negotiations with the pension funds to find ways how they could continue to invest also in Finnish venture capital funds (Prime Minister's Office, 2006).

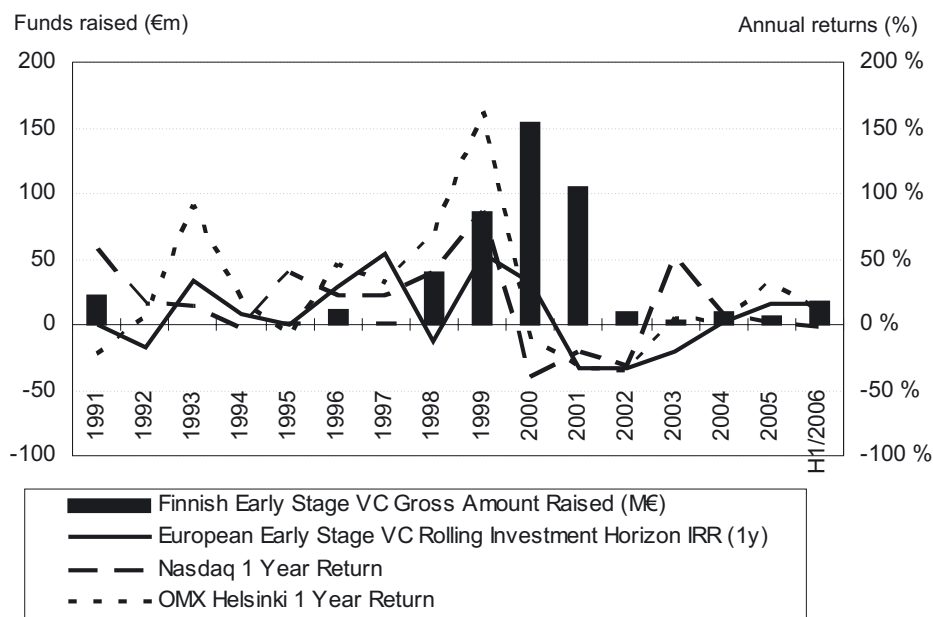


Figure 9. Finnish early-stage VC commitments and European VC, NASDAQ, and OMX Helsinki 1-year returns⁸⁰

This recent limited appetite of Finnish institutional investors towards venture capital has been largely in line with broader European market behavior.⁸¹ In Europe and in Finland, in comparison to the United States, most institutional investors were new to venture capital until the late 1990s. Therefore, they did not benefit from the good exit markets available to incumbent investors by the end of the 1990s. Unfortunately, many inexperienced investors belatedly moved to venture capital at the peak of the market. Thus, for many European institutional investors, their limited experience of European venture capital performance is uniformly poor (as apposed to their returns to private equity). Given the effects of rolling average IRR calculations, this period of 2000 to 2004 has severely depressed European VC performance figures. However, importantly, current research,⁸² and a number of recent success stories suggest that there are no fundamental reasons why venture capital could not work in Finland or the rest of Europe. Contemporary statistics show clearly improved returns to venture capital investments in Europe

80 Sources: NASDAQ, Datastream, VentureXpert. For performance measures of all segments of venture capital and private equity in Europe, see EVCA (2006).

81 (Coller Capital, 2006)

82 (Lindström, 2006)

and Finland.⁸³ However, it is sensible to note that many European national VC industries are extremely inexperienced compared to their US equivalents. This is likely to impact negatively on VC returns for some considerable period in all but the biggest and most international of European VC funds.

As of now, Finnish institutional investors are still very reluctant to invest in Finnish early stage venture capital funds. Only few trusted VC firms have attracted sufficient funds from the market. Others, particularly those with no prior track record, are not of interest to still very cautious investors.⁸⁴ The Finnish Pension Alliance TELA has carried out analysis on their venture capital investment activities and notes that in addition to unsatisfactory past returns they are concerned about lack of management teams with appropriate track records.⁸⁵ Recent research supports the importance of background of venture capitalists as an important performance determinant.⁸⁶ From that perspective there might be a clear need to rethink the Finnish VC policy measures which have been quite passive from the perspective of catalyzing or even enabling experienced individuals for instance with serial entrepreneurship background to become venture capitalists.

However, from the perspective of analyzing future prospects of different segments of venture capital and private equity, the ongoing analysis appears to be somewhat limited. The large weight that has been given in Finland and in Europe in 2003–2006 for performance figures dominated by investments made less than six years ago at the top of the peak around 2000 suggests possible limited awareness of the temporal dynamics of the venture capital market i.e. the importance of the cy-

83 (Braun & Clovis, 2006; EVCA, 2006; Fricke, 2006)

84 It is interesting to note that some of the Finnish institutional investors who categorically reject investment opportunities in first-time-funds in Finland or Europe are happy to let their funds be invested in first time funds in the USA through their investment in US fund of funds with “emerging teams” programs. One further problem in Finland may be the cumbersome previously common practice of involving limited partners in operational decision making concerning first investments and follow-on investments in Finnish funds (Passinen, 2004). This practice can focus LPs to invest in few experienced late stage, low risk funds rather than diversify, take more risk and invest also in early stage. However, not all funds use this practice anymore.

85 (TELA, 2006)

86 (e.g. Gompers, Kovner, Lerner, & Scharfstein, 2006a; Maula et al., 2006a; Söderblom, 2006; Zarutskie, 2006)

cles as well as the J-curve effect.⁸⁷ Within the next five to seven years, it is possible that we will for instance see an increase in global interest rates, which could reduce the present attractiveness of highly leveraged buyout and hedge funds and improve the relative merits of venture capital funds. From future pensioners' perspective, one can only hope for better vintage diversification compared to the late entry in VC at the top of the peak in Europe in 2000–2001. In venture capital and private equity, diversification across vintages is extremely important.⁸⁸

Given the changing, and improving, performance of early stage investment returns over time in Europe, it is important that the FVCA ensures that institutional investors are properly and fully informed about contemporary VC performance trends. If the industry is primarily interested in later stage or private equity type deals, there is likelihood that this important information role may not be fully implemented.

3.2 Government Policy and Funding Instruments

3.2.1 Evolution of the Government Innovation Finance Policy in Finland

Government has had an active role in the development of venture capital market in Finland.⁸⁹ Already in 1967, government backed Sponsor Oy was established with the support of Bank of Finland as a first venture capital company in Finland.⁹⁰ In 1978, government created a tax incentive for riskcapital by making dividend income from portfolio companies' tax exempt on application basis.⁹¹ Sponsor first

87 For instance, the association of Finnish pension funds TELA in its analysis (2006) cites performance figures of Finnish, European and US venture capital and private equity investments including investments until the end of 2003 without mentioning the J curve effect or any other considerations such as the heavy domination of the investments at the top of the bubble on the relevance and validity of the statistics concerning the future prospects. See e.g. Meyer and Mathonet (2005) and Grabenwarter and Weidig (2005) for clear presentations of the dynamics of venture capital market from the perspective of institutional investors. Similarly, the research paper commissioned by EVCA (2004a) is useful in analyzing the performance of European venture capital and private equity with implications to the asset allocation. From a pension fund perspective, the book by Fraser-Sampson (2006) is also likely to be useful.

88 Lerner et al. (2006) concludes in their study on the investment performance of limited partners: "The strong pro-cyclicality of capital flows into the private equity industry seems to be mainly driven by less sophisticated LPs, which subsequently have very poor performance"

89 The early part of this chapter draws heavily from Seppä (2000). See also Hyytinen and Väänänen (2003e) for a review of the evolution of government finance of SMEs in Finland.

90 (Seppä, 2000)

91 Applications were handled by the Ministry of Finance, the first one granted for Sponsor in 1978.

relied on management resources from Industrialisation Fund. However, establishing an own organization, Sponsor was relatively quick in redirecting its focus from early stage investments to financially attractive later stage investments. Sponsor was privatized in 1983. In 1971, government established Kehitysaluerahasto Oy (later Kera and currently Finnvera). In 1990, SFK Finance Oy was created as a subsidiary of Kera to manage a new venture capital fund (Start Fund of Kera).

Sitra has played a very important role in the inception and development of the Finnish VC market. In 1987–1989 Sitra carried out research on venture capital and was influential in the establishment of the Finnish Venture Capital Association in 1990. After Sitra’s transfer from the supervision of Bank of Finland to the Finnish Parliament in 1991, Sitra became active as a venture capital investor. A very large share of the current privately managed VC funds are spin-offs (often management buyouts) from Sitra.

In 1994, government established the Finnish Industry Investment Ltd to act as a fund of funds.⁹² By 1997 there were several public VC management firms (Start Fund of Kera, Finnish Industry Investment and Sitra) undertaking several roles. Inevitably, there was some confusion about the precise roles of specific public organizations, particularly Kera and FII. Finnvera was established in a merger of Kera and the Finnish Guarantee Board in 1998. Start Fund of Kera was moved to FII, which focused on equity investments.⁹³ Between 1997-2000 a large share of government owned venture capital operations were privatized through management buyouts.

After the market crash in 2000–2001 and the subsequent flight of private early stage VCs from the market, challenges were again observed in adequate provision of early stage finance in Finland.⁹⁴ As a direct result, government policy sought to improve the supply of VC finance for early stage companies. FII started a seed program in 2003/2004 and Tekes started to provide startup loans. In 2004 Ministry of Trade and Industry completed a strategy for the seed finance and services available to young innovative companies.⁹⁵ The Government passed a new law on Finnvera

92 <http://www.finlex.fi/fi/laki/alkup/1999/19991352>

93 When establishing Finnvera in 1998, a central argument for transferring Startfund of Kera to Finnish Industry Investment was that equity investments and loan provision should be separated in different organizations due to their different characteristics and to avoid conflicts of interest. (e.g. a press statement: “Venture capital is so different in nature that it is not rational to keep it together with loan provision (authors’ translation)”, Kauppinen V, Industrial Counselor, Ministry of Trade and Industry in Kauppalehti 29.1.1998, page 5).

94 (e.g. Maula et al., 2003a)

95 (Paasivirta et al., 2004)

enabling venture capital activities. This replaced the 1998 law that excluded such investments.⁹⁶ In 2005, based on the financing strategy of the AISP-strategy for years 2005–2007, Finnvera started a “feeder fund” Seed Fund Vera Ltd (Avera), which makes investments in early stage companies that have been ignored by private investors. It is hoped that such early stage support will identify attractive young companies that will subsequently spur the interest of private investors.

In 2005–2006 there have been again some growing concerns about the fragmentation of the public service including perceived overlaps in programs and provision.

Table 1. Time line of the evolution of public financing of young innovative companies in Finland since 1990⁹⁷

1990	Start fund of Kera established as a subsidiary of Kera
1991	Sitra starts venture capital investments after transfer under the parliament
1992	Finnish Industry Investment Ltd. (FII) started as a fund of funds
1993	MTI analyzing reorganization of the public finance of startup companies
1994	Sitra establishes Sitra Bio Fund management Oy
1995	Finnvera founded in the merger of Kera and Finnish Guarantee Board, the new law on Finnvera excludes venture capital activity from the remit of Finnvera
1996	FII acquires Start fund of Kera from Kera
1997	Management buy out of SFK Finance Oy from Kera
1998	Sitra Technology Management Oy established by Sitra and FII
1999	Bio Fund Management Oy (Ex-Sitra Bio Fund Management Oy) established as a spin-off from Sitra
2000	Eqvitec Partners Oy (ex-Sitra Technology Management Oy) established as a spin-off from Sitra
2001	New law on FII with more emphasis on early stage and regional focus as well as channeling EU funding
2002	Regional funds privatized through management buyouts from Sitra
2003	FII directed to focus on early stage. The roles of FII and Finnvera/Veraventure clarified in the management of funds
2004	FII launches the Seed Finance Program
2005	Sitra introduces a new strategy with reduced venture capital activities
2006	AISP-strategy published by the Ministry of Trade and Industry
2007	Government enacts a new law on Finnvera enabling venture capital investments
2008	Tekes launched a startup capital loans program
2009	Avera founded by Finnvera as a direct seed investor
2010	MTI considering the roles of public financing organizations
2011	Sitra proposing a merger of Avera, FII Seed program and Sitra PreSeed activities
2012	Korona Finance Oy established as a spin-off from Sitra
2013	

96 Law on Finnvera (Laki valtion erityisrahoitusyhtiöstä 18.6.1998/443, <http://www.finlex.fi/fi/laki/ajantasa/1998/19980443>)

97 Annual reports, Kauppalehti archives, The Business Information System (BIS)

3.2.2 Public Funding Instruments

Finnish government policy concerning the public financing of young innovative companies has evolved significantly over the past ten years and particularly over the past couple of years. Many of the current major instruments are less than 3 years old. Furthermore, there are ongoing strategy discussions between government and the existing agencies as to how the public financing of young innovative companies could best be developed in the future. Therefore, when considering the evolution of public financing instruments during the next 5–7 years, any analysis of today’s situation should be seen within this changing context. However, the current situation is an important and necessary starting point for future development. Therefore, we will first provide a description of the existing instruments. We will then use this analysis to examine policy programs’ strengths and weaknesses including the possible opportunities that a revision of the current policy structures may bring.

	Finnish parliament				Sitra	Nonprofits etc.	Private firms
	Government						
	Ministry of Finance	Ministry of Trade and Industry					
	Tekes	Finnvera	FII				
Tax & legal environment	Tax and legal environment						
Deal flow generation and match making		TULI, LIKSA, VARA, KEPARA, KAUPPI			INTRO DIILI	Venture Cup, Connect etc.	Consultants, incubator programs etc.
Grants		R&D grants					
Indirect equity (FoF)			Veraventure	FII fund-of-funds activity	Sitra VC fund investments		
Direct equity (VC)			Avera	FII seed program	Sitra PreSeed & Sitra VC investments		VC firms and business angels
Capital loans		Startup loan	Avera & Finnvera (some variation between offices)	FII seed program			VC firms and business angels
Loans and loans guarantees			Finnvera loans and loan guarantees				Banks

Figure 10. Mapping the roles of key actors in the finance of young innovative companies in December 2006 (long-term core areas dark gray, newer areas in light gray)

Table 2. Public financing of young innovative companies in Finland⁹⁸

Organizations and instruments	Description of instruments	Investments in young innovative companies in 2005 (€m)	Number of young innovative companies funded in 2005
Tekes			
Startup loan	Max €100k unsecured loan up to 80% of startup expenses	€6.2m in 2004–2005	64 in 2004–2005 (57 applications of which 16 funded in 2005)
Technology funding	R&D grants and loans (35–50% of costs, average €130k)	€132m for SMEs €42m for micro companies	245 startup companies 500 micro companies
TULI	Max €10k grant. Ends 12/2006, replaced with new instruments.	\$2.7m	659 ideas recognized of which 225 were developed
LIKSA	Max €40k funding (€20k grant from Tekes + €20k convertible loan from Sitra). Ends 12/2006; replaced with new instruments.	\$0.3m from Tekes	24 business plans funded (25 in 2004)
KEPARA	Max €20k/80% for wages, fees and consulting services	Started in 2006	
VARA	Max €15k/70% for external services		437 SMEs
Sitra PreSeed			
INTRO	Business angel market place	Primarily non-financial instrument	37 companies presented in 2005
DILI	Sweat equity market place	Primarily non-financial instrument	
LIKSA	See above (collaboration with Tekes)		24 business plans funded (25 in 2004)
Finnvera	Entrepreneur loan Max €85k/ Startup loan €100–500k Max €500k investments	€183.8m in startup companies less than 2 years old €93.9m in innovative companies Started in fall 2005	3638 startup companies 395 innovative companies
AVERA			
FII			
Seed program	Max 50% investment matching private funding on equal terms, max typically €1m	€10.8m investment decisions (2004; €10m)	47 investment decisions of which 20 follow-on investments (2004: 46/1)
TE Centres	Aid 15%–45%, average €9.6k	€14.4m for starting companies of total €125m	2415
Innofin	Subsidy max 100%/€3k–100k	€2m	

98 2005 annual reports, Ala-Opas et al. (2006), Grönholm (2006), Tekes web page and other sources

Tekes,⁹⁹ **the Finnish Funding Agency for Technology and Innovation** is a major funding organization for young innovative companies through their primarily R&D finance remit. Overall, Tekes provided €429m of funding in 2005, of which €250m went to company projects and €179m to projects of universities and research institutions. In 2005, Tekes funded projects of 1826 companies. A large share of young innovative companies in Finland has received funding from Tekes to support their R&D work. However, after the collapse of the technology-boom, the lowered availability of private funding somewhat constrained the use of Tekes funding because of the ‘matching’ requirement of investing own funds to get Tekes funding.¹⁰⁰ Between 2003–2006, Tekes has provided annually some €40m funding for about 300 companies with the age of 6 years or younger. During the past few years, Tekes has expanded its role from technology to innovation including increased support for commercialization. In 2004, Tekes established a startup loan instrument, which can provide a maximum of 80% of the eligible start-up costs for new companies (max €100k in Phase I, max €200k in phase II since July 2006). Furthermore, Tekes has financed the TULI program (max €10k grant to buy expert services to prepare research commercialization)¹⁰¹ and the LIKSA program (max €20k grant from Tekes + €20k convertible loan from Sitra to buy support for business plan development to improve investment readiness). Other products include VARA funding to prepare business plans and KAUPPI for innovation centers in universities to help commercialize the results of a group of research projects (€1.8m for 8 KAUPPI projects in 2005). In 2006, Tekes has also provided KEPARA funding to buy advisory services for new companies.

For many reasons, including the perceived need to reduce the fragmentation of its instrument portfolio and improve customer orientation, the need to deepen the support for young innovative companies, and the new framework conditions stemming from new EU legislation,¹⁰² Tekes is currently developing its portfolio quite significantly. Year 2007 will be a transition year during which some old instruments such as TULI, LIKSA and startup loans will be downscaled in their current form and new instruments will be introduced and promoted. The new EU legislation will allow a larger proportion of public investments in individual companies where a market failure is evident. As a consequence of this policy change, Tekes is currently revising its portfolio of policy instruments and considering whether and how it could develop a more selective approach. One priority, reflecting the new interest in commercialization of R&D, is the challenge of how Tekes can best col-

99 <http://www.tekes.fi/eng/>

100 (e.g. LTT-Tutkimus Oy, 2005)

101 (Valovirta, Oosi, Uusikylä, & Maula, 2006)

102 (European Commission, 2006a)

laborate with private investors and thereby connect its young client enterprises more directly to growth markets and new customer needs.

Some of the strengths of Tekes include the relative clarity of its original purpose despite its recently expanded role. For most activities, there are no close substitutes from other government funding activities. The organization's personnel are widely respected for their technical understanding and competencies. Tekes is seen as an important contributor to Finland's internationally recognized innovation status. Also the sizeable annual budget based financing gives strength, allows research activities, and enables Tekes to be more counter-cyclical compared to those institutions with a more immediate profit orientation. Tekes has also been seen as proactive and development oriented, although this view is not universal. Some of the challenges from the perspective of finance of young innovative companies are that Tekes has until lately been very technology-focused with less emphasis and understanding of the commercialization challenges. Furthermore, Tekes has been seen to have somewhat limited market and customer information in project selection, which is particularly important attribute for any commercialization activity. Also lack of coordination between products (i.e. underdeveloped account management / customer service) has been seen as a weakness.

Finnish Industry Investment Ltd¹⁰³ is a government-owned investment company. It engages in equity capital investment and invests in venture capital funds, private equity funds and, increasingly, directly in selected target companies through an FII controlled seed fund. Finnish Industry Investment Ltd is administered by the Ministry of Trade and Industry. In the end of 2005, the investments and investment commitments of FII totaled €325.6m. The primary mandate given to the Finnish Industry Investment by government has been to stimulate the creation of new, privately managed venture capital funds in Finland.¹⁰⁴ However, during the past few years, FII has enjoyed somewhat limited success in this primary activity.¹⁰⁵ This is in largely due to the unwillingness of Finnish pension funds to co-invest with government in Finnish early-stage focused venture capital funds.

103 <http://www.industryinvestment.com/> For recent evaluations and impact analyses, see Maula & Murray (2003a) and Hjelt & Vanhanen (2005).

104 The Act on Finnish Industry Investment Ltd. 1352/1999 (<http://www.finlex.fi/fi/laki/alkup/1999/19991352>) sets the objective for FII: "The purpose of the state-owned company Finnish Industry Investment Ltd. is to improve the conditions particularly for small and medium-sized firms by making equity investments in venture capital organizations. The company may make equity investments directly into target companies particularly when long-term risk taking is required." (authors' translation). The primacy of fund of funds activity has been further clarified in the recent Government bill to replace the existing law on FII (HE 180/2006 vp).

105 Between 2002–2006, FII has not been able to influence the creation of many new Finland-based VC funds with an early stage focus and sufficient size (e.g. above €40m as a lower end of commercially viable VC funds).

FII has held to a very strong principle of investing on equal terms (*pari passu*) with private investors. Although the principle ensures certain commercial discipline, it has further limited the public tools available to incentivize private investors when they would not otherwise invest.¹⁰⁶ However, FII has also had a clear drive towards increasing its role as direct investor in ventures.¹⁰⁷

As a response to the identified gap in the financing of young innovative companies in 2003, FII first attempted to catalyze new funds, but without success, started a new seed finance program in 2004 establishing a €50m seed fund. In this recent program, FII invests directly in ventures on equal terms with private investors. The deals are sourced by private investors and FII normally does not take a board seat in the companies which it funds. The lead role in this public/private syndication is always taken by the private investor. In 2005, FII made 47 investment decisions in this program. In December 2006, the board of FII made a decision to allocate further €50m to the second internal seed fund.

One of the strengths of FII is that it is the most important public channel for fund-of-fund investments in venture capital funds. FII has clearly improved the supply of capital to the Finnish VC industry during difficult years, both through its fund of fund operation as well as through its direct seed program. FII is widely perceived to have a commercially focused and experienced management team. Some of the challenges relate to the tight profit orientation and *pari passu* principles of

106 In our view, *pari passu* is a good default option for government fund of funds operation under circumstances when it is sufficient to catalyze the private investment needed to rectify an identified market failure. However, usually market failures result from private investors perceiving too low return/risk ratio in a certain market segment. If the government cannot alter the perceived return/risk ratio and is tied to investment decisions of private investors, any government intervention is likely to be pro-cyclical and potentially ineffective in correcting the market failure. Asymmetric profit sharing models with open bidding process have been adopted in certain countries to tackle this problem (See Chapter 2 and Appendix 1 for reviews). For some additional views of these issues in the Finnish context, see Hyytinen and Väänänen (2003e) and Hyytinen, Rouvinen, Toivanen and Ylä-Anttila (2003d). In the past, the EU notification process used to be a significant delay in developing new venture capital fund models using asymmetric profit sharing, but the process is nowadays likely to be faster for programs such as the UK Enterprise Capital Funds after its positive evaluation by the Commission in 2005 and the recent new guidelines on state aid to support risk capital investments in SMEs (European Commission, 2006e).

107 One reflection of the increasing role of direct investments in the organizational identity of FII is its statement of its objectives. The currently stated objectives emphasize direct investments in seed and growth stage companies and excludes the primary task of helping create new venture capital funds (“to promote product realization and commercialization of new innovations by investing in seed and growth-stage Finnish enterprises, to promote regional venture capital investment, promote efficient and appropriate channeling of risk capital from EU sources to funds and companies, to use direct investments to enable major investments in corporate development, corporate restructuring and the launch of new industrial projects.”(partially authors’ translation from the objectives stated on the web page <http://www.teollisuussijoitus.fi/yhtio/index.html>, the same version also stated in the introduction of the impact analysis commissioned by the board of FII (Hjelt et al., 2005)). This has changed since prior evaluations (Hyytinen et al., 2003e; Maula et al., 2003a).

FII. These have reduced the agency's opportunities to act counter-cyclically and the opportunity to fulfill its primary goal, i.e. helping to create new, viable venture capital funds that invest in early stage companies. As a fund-of-funds investor, FII has been perceived to be an important, but somewhat passive investor. A more active role for FII in helping catalyze new funds would have been warranted in the opinions of a number of respondents interviewed. It has also been felt that FII's mixed portfolio of direct and indirect VC investments obfuscates the original remit of FII. The agency's newer seed program has been perceived to be important during the recent years of few active private seed capital funds. However, it has been criticized for not rewarding co-investors' contribution to value-added in portfolio firms. Furthermore, one perceived threat is that the seed program is growing into a very large direct investment program with significant implications for future government commitment of further finance.¹⁰⁸ From the value adding perspective for globalizing ventures in direct investments, there are some limitations in the availability of serial entrepreneurship background and in the use of global market information and network connections. This lack of specialist enterprise support is a particularly serious weakness for an organization investing directly in new and growing firms in technology domains. Concerning ideas presented by FII's management of introducing carried interest compensation in FII's internal funds, although such incentives are important and appropriate in private venture capital funds that are raised competitively, we are skeptical about their appropriateness in internal funds of a government organization with the remit to rectify market failures primarily as a fund of funds catalyzing new privately managed funds.

Sitra, The Finnish National Fund for Research and Development¹⁰⁹ is an independent public foundation under the supervision of the Finnish Parliament. It has had a major role in the development of the Finnish venture capital market since the beginning in 1990. In the end of 2005, it had total assets of €642m. Until recently, Sitra has had a broad range of direct investment activities. However, in 2004, Sitra announced a new program-based strategy¹¹⁰ which has resulted in the agency largely withdrawing from an involvement in the financing of young innovative companies. Sitra has refocused its activities on a small number of strategic programs some of which have a venture capital involvement. However, overall Sitra has clearly reduced its role as an early-stage venture capital investor. Another role

108 However, the management of MTI has convinced that based on their modeling the operation of the seed investment activity as an evergreen operation including any follow-on investments in the ventures should never commit more than some €85m.

109 <http://www.sitra.fi/en/>

110 "New system of programme working means considerable challenges for Sitra." Sitra press release 22.11.2004, Finnish National Fund for Research and Development Sitra, Helsinki, Finland.

Sitra has played is in developing the finance of young innovative companies is its role in matching entrepreneurs and business angels, which it started in 1996.

More recently, Sitra has focused this and related activities in Sitra PreSeed, an entity which implements the INTRO, LIKSA, and DIILI services. INTRO is an introduction service for entrepreneurs and business angels based on a register of some 450 business angels and five annual INTRO Forums in which selected entrepreneurs present investment opportunities for ventures. These events are coordinated by Sitra, which also selects the companies that are invited to present to informal investors (37 companies presented in 2005). In addition to coordinating the market place, Sitra also acts as an investor.¹¹¹ LIKSA, implemented in collaboration with Tekes, supports entrepreneurs in the development of business plans by offering max €40k to buy professional advisory services (half of the amount is grant from Tekes and half is a convertible loan from Sitra).¹¹² In the DIILI service, Sitra matches entrepreneurs with seasoned sales executives.

Some of the clear strengths in Sitra PreSeed's activities are the centrality of Sitra as an actor, its resources, and to date its long term commitment to establishing the informal venture capital market in Finland. INTRO is seen as a very important marketplace, but according to some stakeholders it is slightly constrained by the controlling role of Sitra. As a rule, Sitra views its role as developer of the innovation system rather than an operator of existing activities. Thus, both Sitra and other stakeholders view that there could be changes in the future management arrangements of these operations. Some of the extant challenges are that Sitra's profit orientation may hamper activities that cannot easily be profitable (e.g. platform building). Furthermore, Sitra's strategy to pioneer new things and spin them off after the initial program period can be challenging in areas that require longer-term public support. Many interviewees also expressed concerns about the perceived lack of openness and transparency of INTRO market place activities. In their opinion, this has lead to full potential of the marketplace not being realized. There were some concerns of adverse selection in the deal flow on both sides partly due to both Sitra's tight control and investment objectives. Some of the problems were seen as related to Sitra's prior goal of sourcing its own investment opportunities from match-making activity. Sitra's own interests were perceived to influence the match-making activity.

111 "In addition to managing the investment process, Sitra considers the companies presented at INTRO as an investor." <http://www.preseed.fi/intro/default.asp?l=1>

112 LIKSA has been decided to be discontinued in the current format in the end of 2006. Sitra will continue to provide similar convertible loans and Tekes will renew its funding and service portfolio in 2007 and in the mean time can provide equivalent funding e.g. through it's VARA instrument.

Finnvera Plc¹¹³ is a government owned, specialist company offering financing services to promote both the domestic operations and internationalization activities of Finnish businesses. Finnvera is fully owned by the Finnish state. It is also Finland's official Export Credit Agency (ECA). In 2005, Finnvera provided €895.3m domestic financing (€405.8m loans, €425.6m domestic guarantees, and €63.9m export guarantees). Finnvera has several products for SMEs including Finnvera Development Loan for financing development projects of SMEs (50-75% of project's costs, usually max 5 years, with subsidized interest and security negotiated case by case) and Finnvera Entrepreneur Loan for the founder, someone taking over a business, and for a shareholder working in the enterprise (max €100m, max 80% of the cost, subsidized interest, max 10 years with max 3 years amortization free). Concerning equity finance for young innovative companies, Finnvera's 100% owned subsidiary, Veraventure Ltd, has had a central role since 2003. Veraventure has two related activities. First, it is a 'fund of funds' owning the government stakes in the 14 regional 'evergreen' venture capital funds which are structured as limited companies with a total capital base approximately €70m. Secondly, Veraventure Ltd serves as the management company of Seed Fund Vera Ltd (Avera), which began operations in August 2005 following the AISP strategy of the Ministry of Trade and Industry published in the previous year. The initial funding was €11.5m and recently €38.5m of new funding was allocated for the years 2007-2009. Avera can invest in Finnish start-up companies without requiring the co-investment of syndicating partners. The target is to complement the funding available from other investors and fill a funding gap between R&D finance and private or public venture capital for early stage commercialization of R&D.¹¹⁴ However, very commonly portfolio companies receive simultaneously R&D funding from Tekes as well as funding from other sources, e.g. business angels. Avera investments are typically a combination of equity (around 40%) and equity loans (around 60%) with the total investment ceiling of below €500k.

Some of the strengths of Finnvera's operations related to young innovative companies have to do with its local presence in all Finnish regions. Finnvera is perceived by interviewees as an appreciated professional provider of loan and loan guarantee instruments. Some of the challenges include the variation in operations, investment criteria, and instruments employed between different regions. Related to venture capital activities (Avera) there are several particular challenges pointed out by many interviewees: (1) Avera has little global market information (a particularly serious weakness in equity funding of growth-oriented young innovative

113 <http://www.finnvera.fi/index.cfm?id=3>, for a recent review, see Heinonen and Smallridge (2004).

114 The stated purpose of Avera is: "...to eliminate the point of discontinuity existing between financing schemes for product development and private venture capital investment." <http://www.veraventure.fi/index.asp?language=2>

companies);¹¹⁵ (2) the handover exit model in direct seed investments is likely to be challenging in practice; (3) the approach where Avera invests in ventures in which no private investor or FII is willing to invest has been seen as having a clear risk of distorting the market.¹¹⁶ Furthermore, mixing the roles of debt provider and venture capitalist has been seen as problematic given the potentially conflicting interests of creditors and equity holders.¹¹⁷

T&E Centres¹¹⁸ i.e. Employment and Economic Development Centres were established by The Ministry of Trade and Industry, the Ministry of Agriculture and Forestry, and the Ministry of Labour to combine and integrate their regional forces. Fifteen centers countrywide provide a range of advisory and development services for businesses, entrepreneurs, and private individuals and funding for investments, for development of SMEs, for processing and marketing of agricultural products, and for improvement of the business environment of enterprises.¹¹⁹ In 2005, T&E centres provided total of €125m funding for 2 415 companies. The funding from T&E centres for SMEs is discretionary support, which is granted on the basis of a company or project analysis of each project. The aid is directed at projects in which the aid is estimated to make a substantial contribution to the implementation of the project. The aim is to promote general economic development, business policy objectives and employment by means of corporate financing. T&E centres also channel significant amounts of the European Regional Development Fund (ERDF) funding. Although many of the interviewees in our context of highly growth-oriented young innovative companies were not familiar with the services of T&E centres, we heard about examples of small scale support having been received e.g. to enable important foreign customer presentations. Some early stage investors also saw it possible to receive some support to cover due diligence costs.

115 The management of Veraventure admits that Avera's due diligence process is not designed so that it would be possible to systematically assess whether e.g. an identical venture has already been financed in Sweden or the United States.

116 For instance, private investors might not want to invest (a) if there is something that needs to be corrected in the company (e.g. dysfunctional team) or (b) if the valuation is too high. If the company received a VC investment without identified problems being fixed or with too high valuation, it is very hard to receive follow-on funding.

117 Finnvera argues that this problem is solved by separating the two activities within the organization. In the evaluation of Finnvera it was earlier urged that the existence of a "Chinese wall" separating loan and risk finance is evaluated and ensured (Heinonen et al., 2004). As pointed earlier, in 1998 equity investment activities were moved from Kera to FII in 1998 largely to separate these different types of investment activities.

118 <http://www.te-keskus.fi/web/ktmyht.nsf/FrameSetENG?OpenFrameSet>

119 <http://www.te-keskus.fi/web/ktmyht.nsf/UNID/33892C303219F6DCC22571920030C91E?OpenDocument>

Overall, however, the funding levels of T&E centres are small per company and not among the key instruments by many high growth ventures.

Foundation for Finnish Inventions¹²⁰ supports and helps private individuals and entrepreneurs to develop and exploit invention proposals both within Finland and internationally. The Foundation is mainly funded by the Finnish Ministry of Trade and Industry. The staff includes 24 technical and commercial experts and in addition there are 28 innovation managers in universities or Employment and Economic Development Centers in different parts of Finland. Besides the evaluation, protection, promotion and product development of Finnish inventions, the Foundation's services include: financial support (risk financing, grants and loans); marketing and commercialization of inventions; search for Finnish and/or foreign partners; licensing offers; information on inventions and innovations through media coverage, seminars and relevant trade affairs; and legal and other assistance in licensing negotiations and preparing agreements. FFI has seen as a problem that many promising inventions cannot be supported to the proof of concept stage and has therefore proposed a capital loan instrument for that purpose (nb. decision suspended so far). However, e.g. Tekes has already related instruments, so enhanced coordination and collaboration with Tekes and other relevant organizations is important.¹²¹

Finpro¹²² is an association founded by Finnish companies focused on supporting the internationalization of Finnish companies. It does not provide funding, but has services in which it acts as an advisor to companies seeking finance. In 2005 Finpro operated 53 export centers in 40 countries. It receives funding from the Ministry of Trade and Industry. The financial support from the Ministry of Trade and Industry has been €20.3m per year. Finpro collaborates with other organizations including Tekes. Finpro plays an important role in new international innovation centers FinNode¹²³ and FinChi¹²⁴. Many internationalizing young innovative companies use Finpro's services e.g. when entering new markets. Finpro has also played sometimes a role in facilitating cross-border investments in Finnish ventures.

120 <http://www.innofin.fi/>

121 This has also been pointed in a recent evaluation of the Foundation for Finnish Innovations (Kutinlahti et al., 2006).

122 <http://www.finpro.fi/en-US/Finpro/>

123 <http://www.finnode.com/>

124 <http://www.finchi.cn/>

Invest in Finland¹²⁵ is an expert service organization promoting foreign direct investment in Finland funded by the Ministry of Trade and Industry. It mainly focuses on assisting foreign companies make ‘green field’ entries into Finland, i.e. establishing new subsidiaries. However, it has so far excluded from its scope the support of foreign investors who might wish to invest in Finland via venture capital investments in Finnish companies or by setting up Finnish R&D centers based on acquired Finnish technology companies. Collaboration increased with Finpro and Tekes in 2005.

Some perceived challenges in the public provision of risk capital. A majority of the instruments reviewed are targeted to address an identified problem. However, in the light of experience there are a number of difficulties or inefficiencies in their design. Of the various instruments, the programs providing direct seed financing (FII’s seed financing program and Avera) are the closest to each other in design and purpose. Based on the interviews, most perceived overlaps concern these two instruments, even though there has been an agreement between the agencies that basically should create a “territory” for each (i.e. Avera does not invest if private investors or FII are willing to invest). They both employ different types of investment criteria to avoid the ‘crowding out’ of private investment. However, each approach appears to have its limitations. In FII’s case, there is an absence of incentives for private lead investors that would compensate them for the necessary time and attention they have to allocate to early stage enterprises. This is likely to result in managerial talent avoiding early stage funds to work at the later stages of the VC or PE industry.¹²⁶ In some sense, the strong drive by FII to make profits may be counterproductive from the perspective of the key purpose of the public agency’s intervention. In Avera’s policy, one problem is the negative certification effect it might provide for its portfolio companies when the condition for receiving investment is that they are not of interest for other investors at the time of the investment as stated in interviews. Furthermore, the investment policy of government investor investing alone in companies that have not attracted funding from other investors appears to be quite clearly against the cumulative international (and Finnish) expe-

125 <http://www.investinfinland.fi/>

126 In a model where government investor is passive and private investor is expected to do all the work, and where both invest with same terms without any compensation for the private investor, the management fees can be argued to be in effect halved for the private investors for the money they effectively manage (their own investment + matching government share assuming 1:1 match). For business angels, in comparison to VC funds, co-investments are more logical complement given their more limited ability to raise additional funds – co-investments help them make bigger deals with their own funds and to cross the so-called secondary gap (e.g. Sohl, 2007). To facilitate a flourishing private early stage venture capital market attractive for competent venture capitalists and capable of producing good returns, a high priority should be placed on ensuring sufficient fund size of private venture capital funds (e.g. European Commission, 2005a; Murray, 2007; Murray et al., 1998; United States Department of Commerce and European Commission, 2005).

rience and research knowledge on effective government VC policy and can be argued to have a clear risk to distort the market.¹²⁷ Although there is still somewhat limited evidence on the real magnitude of these problems, they are perceived to be serious by many of the few private actors these schemes are supposed to support and activate. Therefore, if the purpose of the government policy is to help create a thriving private risk capital market and not replace it by government activity, in our view it would be unwise to ignore them and to not try to further develop the government intervention to eliminate these perceived problems and to ensure that the government policy optimally catalyzes value adding private investment activity.

3.3 Change Drivers

There are several drivers that are likely to cause pressures to develop the public financing of young innovative companies within the time horizon of this report i.e. the next five to seven years. Some identified issues are discussed in the following chapters.

3.3.1 Globalization of the Marketplace¹²⁸

The business operations of young innovative companies have been very international for a long time. The term “born global” was coined in the early 1990s and

127 OECD (1997) recommends: “Fund management – Public officials should not be directly involved in the investment process. Rather, this responsibility should be delegated to top-quality venture capitalists from the private sector. While the government should monitor programmes, its involvement in investment decisions should be minimal and the decision-making mechanism should be transparent.” See also Gilson’s (2003) arguments related to lack of proper incentives and competencies, Lerner’s (2002) arguments concerning potential political distortions in decision making, Manigart et al. (2002) arguments on lower return expectations of the government investor crowding out private investors and possibly actually prevent the creation of an active and flourishing private VC market as well as several other arguments in Manigart et al. (2001) and Murray (2007). Concerning the crowding out argument, Leleux and Surlemont (2003) summarize: “Finally, and more damaging to the industry as a whole, if public funds forego some expected returns for their policy objectives, financing projects at below-market rates, they may end up attracting the best projects, leaving only “lemons” for private VC firms to fund, making the entry of new, independent private equity funds more difficult.” Armour and Cumming (2006) find empirical evidence on the crowding effect in a sample of 15 countries over a period of 14 years. As a recent exception to models trying to catalyze privately managed funds instead of direct government investments, Germany launched in 2005 High-Tech Gründerfonds program (<http://www.high-tech-gruenderfonds.de/en/index.html>), in which investments up to €500k will be made in about 300 technology-based companies with an opportunity for an additional €500k round for selected companies. The management of Avera views this model as a comparable model, although there are differences between them and as a new model there is little knowledge of its performance.

128 (Deloitte, 2006b; European Commission, 2006d)

presently for instance 59% of all Finnish software ventures have international operations.¹²⁹ In a recent survey of all Finnish companies less than 1 year old, approximately one quarter (27%) had targeted international markets.¹³⁰ The importance of international sales in growth plans is significantly greater for growth oriented companies. For such firms internationalization is imperative.¹³¹ For smaller economies such as Finland, Denmark or Israel the limited revenue potential of the domestic market obliges ambitious young firms to internationalize rapidly and substantially in order to establish a viable economic position in their specialist technical markets. In practice, based on experiences of several successful and innovative Finnish ventures, there are a number of requirements if such firms are to internationalize successfully. For example, it is desirable to establish English as the company language from the time of firm formation to be able to recruit international talent and to make the company transparent to foreign partners and investors.¹³² Strategically, such firms face major decisions extremely rapidly including, for example, the need to recruit experienced foreigners from key target markets to complement the senior management team, and major decisions on locating sales and service functions outside the domestic market and close to the key foreign customers.

Although a large share of growth oriented ventures have understood international (if not 'global') operations as a necessity for a long time, many investors and support organizations are only slowly waking up to this reality. It is still quite recently that Finnish venture capitalists have internationalized their own operations beyond an exclusively domestic or (at best) a Nordic focus. Very few of them have recruited foreign expertise to their boards of directors or to the highest management levels of their executive teams. The situation is worse still in public organizations supporting growth oriented ventures. Tekes, Sitra, Finnvera or FII have sought or attracted extremely few foreigners as senior employees. This is possibly because a majority of such public agencies operate largely in the Finnish language making it hard for non-natives to remain other than peripheral to the main decision processes. For example, at the time of completing this report (December 2006), Tekes

129 (Lassila et al., 2006)

130 (Pajarinen et al., 2006c)

131 A long term study of NTBFs in the UK and Germany found a strong association between internationalization and continuing growth with a majority of high tech young firms internationalizing within two years of having a saleable product or service. By year 12, the average UK and Germany NTBF had sales in 16 and 10 countries respectively (Cowling, Fryges, Licht, & Murray, 2007).

132 See also Cardwell et al. (1999). This has been pointed out publicly e.g. by founders of Smartner (now part of Seven Networks) and CRF, both rapidly growing international ventures rated among the best in Europe by Red Herring, Tornado Insider and other ranking lists.

does not provide funding application instructions in English on their web page.¹³³ Such a clear statement about the predominance of a domestic Finnish focus has not made it any easier to attract talented and experienced foreigners to come and build new business in Finland. This behavior is in strong contrast to efforts within the UK, Australia, Canada or Israel to recruit international managerial talent from the potential immigrant pool. It is even more salutary to compare the Finnish record to recruitment practices in the USA, a country which remains a magnet for highly skilled and motivated entrepreneurs across the world. It is a hugely telling statistic that in the United States approximately 47% of current, venture capital backed ventures have been founded by immigrants.¹³⁴

3.3.2 Maturation of the Marketplace

European and the Finnish venture capital have changed dramatically over the past ten years. Whereas experienced venture capitalists and growth oriented high tech entrepreneurs were nearly nonexistent in 1996, the current cadre of Finnish venture capitalists is on average much more experienced.¹³⁵ Also serial entrepreneurs have started to emerge.¹³⁶ The understanding of entrepreneurship among students and research communities is also much wider in Finland.¹³⁷

Overall, it seems that some of the recent pessimism towards the prospects of early-stage venture capital firms in Finland, and more generally in Europe, is likely to be unfounded. While there is a lot still to be improved in the functioning of venture capital both in Finland and in Europe, there is no reason why venture capital cannot evolve to become an attractive asset class in Europe.¹³⁸ If there is one clear lesson from the last twenty years of venture capital activity in Europe it is that talented and incentivized investors and fund managers learn quickly in com-

133 <http://www.tekes.fi/eng/> (cited December 30, 2006)

134 (Anderson & Platzer, 2006)

135 (Bassi & Jormakka, 2006; Passinen, 2004)

136 In the United States serial entrepreneurs are an important source of deal flow to venture capitalists with about 10% of the VC-backed entrepreneurs being serial entrepreneurs and the share being somewhat higher, about 15% for the leading VCs (Gompers, Kovner, Lerner, & Scharfstein, 2006b).

137 As one example, already 2018 teams have participated in the Venture Cup Business Plan competition in Finland during the first seven seasons of the competition in 2000–2006.

138 (Lindström, 2006)

petitive and open markets. Many recent European success stories¹³⁹ and the greatly improved European short-term returns in early stage VC¹⁴⁰ provide some further evidence supporting this conclusion. Overall, European venture capital is clearly on its way to a stage of professional maturity.¹⁴¹ However, there are likely to be several stages of maturity as the industry repeatedly adapts and re-invents itself to reflect both contemporary opportunities and threats.¹⁴²

3.3.3 New EU State Aid Regulation and Funding Programs

In 2006, the European Commission has made several relevant changes in the state aid regulation as a part of its state aid reform. These changes have a direct effect on the flexibility of member states to provide financial support for young innovative companies and early stage venture capital funds. A number of changes were made to make it easier to set up public supported, early stage VC funds in areas where there were clearly problems of limited interest and activity by private and commercial financiers. The European Commission has now relaxed a number of constraints which have previously limited the degree of involvement of public agencies in the creation and operation of such funds. Changes in the new state aid regulations include:

- **New de minimis regulation, exempting aid notification below €200k.**¹⁴³ The Regulation exempts small subsidies from the obligation to notify them in advance for clearance by the Commission under EC Treaty state aid rules. Under the new Regulation, aid of up to €200k per company, granted over any period of three years will not be considered as state aid. Loan guarantees will also be covered to the extent that the guaranteed part of the loan does not exceed €1.5m. In order to avoid abuses, forms of aid for which the inherent aid amount cannot be calcu-

139 e.g. Skype as an example of one of the best early stage investments ever. A large number of Finnish ventures have been recognized among the best in the ranking lists of Red Herring, Tornado Insider and Deloitte during the recent years (e.g. CRF, Futuremark, Hybrid Graphics, Jutel, Leiki, Liekki, Meridea, Smartner(Seven), Sulake, Wicom) and many others such as Digital Chocolate, MySQL, Silecs and Trulia have Finnish entrepreneurs. Some founders of these and other leading Finnish ventures have already established new ventures and become serial entrepreneurs.

140 (e.g. Braun et al., 2006; EVCA, 2006; Fricke, 2006)

141 (Bassi et al., 2006)

142 (Murray, 1991)

143 (European Commission, 2006b)

lated precisely in advance (so-called ‘non-transparent’ aids) and aid to firms in difficulty have been excluded from the Regulation.

- **New state aid framework for research, development and innovation.**¹⁴⁴ The new framework introduced an aid for young innovative enterprises “to deal with the market failures linked with imperfect and asymmetric information, which harm these undertakings in a particularly acute way, damaging their ability to receive appropriate funding for innovative ventures” According to the framework, the following conditions must be fulfilled:

(a) The beneficiary is a small enterprise that has been of existence for less than 6 years at the time when the aid is granted and

(b) The beneficiary is an innovative enterprise, on the basis that:

i) the Member State can demonstrate that the beneficiary will in the foreseeable future develop products, services or processes which are technologically new or substantially improved compared to the state of the art in its industry in the Community, and which carry a risk of technological or industrial failure. This evaluation must be done by an external expert, notably on the basis of a business plan or

ii) the R&D expenses of the beneficiary represent at least 15% of its total operating expenses in at least one of the three years preceding the granting of the aid or in the case of a start-up enterprise without any financial history, in the audit of its current fiscal period, as certified by an external auditor.

(c) The aid is not higher than €1m. This aid may not exceed €1.5m in regions eligible for the derogation in Article 87(3)(a), and €1.25m in regions eligible for the derogation in Article 87(3)(c)

The beneficiary may receive the aid only once during the period it qualifies for young innovative enterprise. This aid may be cumulated with other aid under this framework, with aid for research and development and innovation block-exempted by Regulation 364/2004 or any successor regulation and with aid approved by the Commission under the risk capital guidelines. The beneficiary may receive state aid other than R&D&I aid and Risk Capital aid only 3 years after the granting of the young innovative enterprise aid.

144 (European Commission, 2006a)

- **New guideline on state aid to support risk capital investments in SMEs.**¹⁴⁵ The new guidelines include a ‘safe harbour’ of €1.5m investment per SME over 12 months (below which a market failure has been found to exist), a light assessment procedure for clear cut cases fulfilling certain conditions and assessment criteria which ensure that state funding will leverage private investment, target market failures and be proportionate. The Guidelines replace the 2001 Communication on state aid and risk capital.

These new regulations will have implications on the future development of the public finance of young innovative companies. For instance, Tekes has started a planning process to completely renew its services, including the discontinuation and replacement of Startup loans, the TULI program¹⁴⁶ and the LIKSA program, with new services enabled by the new regulations. The direction is towards less fragmented services with a more professional focus on customers. The new regulation may also have other implications on existing programs. Avera was designed on prior De Minimis regulation. Similarly, the FII seed program was also structured in the light of the prevailing and strong constraint that the total of public finance (regardless of source) in companies or funds must not exceed 50% of total transfers. The new state aid to support risk capital investments in SMEs improves significantly the flexibility in setting up government sponsored venture capital programs such as the UK Enterprise Capital Funds scheme.

In addition to the more flexible state aid regulation, the commission has new funding programs that are of high relevance to young innovative companies and their financiers CIP and JEREMIE:¹⁴⁷

Competitiveness and Innovation framework Programme (CIP)¹⁴⁸ is intended to be a coherent and integrated response to the objectives of the renewed Lisbon strategy.¹⁴⁹ Running from 2007 to 2013, it has a budget of approximately €3.6 bn. It represents a 60 % increase in annual spending on actions related to competitiveness and innovation by 2013 compared to 2006. There are three specific programs in the CIP framework: (1) Entrepreneurship and Innovation Programme (€2166m of which €430m eco-innovation and €1130 financial instruments managed by

145 (European Commission, 2006e), http://ec.europa.eu/comm/competition/state_aid/reform/reform.html

146 (Valovirta et al., 2006)

147 (European Commission, 2006c)

148 http://ec.europa.eu/enterprise/enterprise_policy/cip/index_en.htm

149 (European Council, 2005)

EIF); (2) ICT Policy Support Programme (€728m); and (3) Intelligent Energy-Europe Programme (€727m). In addition, Eco-innovation will be a transversal theme of the whole program.

Joint European Resources for Micro to Medium Enterprises (JEREMIE)¹⁵⁰ is a joint initiative of the European Commission, European Investment Bank and European Investment Fund to improve SMEs' access to finance in the framework of European Regions. The initiative will enable European Member States and Regions to use part of their structural funds (ERDF funding) to obtain a set of financial instruments that are specifically designed to support micro and small and medium enterprises. JEREMIE will be complementary to other SME finance initiatives at EU level, notably the Competitiveness and Innovation Framework Programme (CIP) that EIF will operate from 2007 on behalf of the European Commission's Directorate General for Enterprise (DG ENTR). JEREMIE will offer different financial instruments from those available under CIP. JEREMIE will provide a range of instruments focused on regional level, such as investments in regional venture capital funds, technical assistance or the provision of equity to financial intermediaries and eligibility will be limited to "objective" regions.

3.3.4 Internal Pressures to Develop the System

Excessive reliance on government funding or services solving problems. Government intervention in the financing of young innovative companies has so far most often meant government funding being channeled through government agencies. Considering the vast research knowledge (summarized partially in chapter 2.2) showing clearly that primary role of the government should be to improve the functioning of the private market and only secondarily supply capital, there has perhaps been too heavy emphasis on government funding as a solution to under developed risk capital market for young innovative companies in Finland. The volumes of direct government venture capital investments have increased lately. Furthermore, the relaxation of EC regulations may act as a perverse incentive to increase the amount of public finance available in the funding system. There is a temptation for policy makers to take full opportunity to increase the levels of public funding in the innovation system. Such a response may well exacerbate problems of crowding out private sources of funds which have to meet market determined rates of return on any monies raised. Early-stage funding in Europe is already heavily skewed towards public rather than private provision of risk capital. The immediate crafting of public, supply side strategies takes little cognizance of alternative policy instruments which may increase the commercial logic of private

150 <http://www.eif.org/jeremie/>

investors addressing existing market gaps. It is worth regularly repeating that it is the primary task of the government is to ensure that the framework conditions for investment in innovative young companies are as attractive as possible in order to encourage private commercial activity.¹⁵¹ Government's role is to address and remove market failures rather than to provide alternative non-market routes via public subsidy. This primary task of the government is regularly neglected in the domain of innovation finance.

Fragmentation and inefficiencies of the public structure. A clear conclusion from the interviews, analysis, and prior research¹⁵² is that the current structure of public finance available to young innovative companies is somewhat fragmented. This fragmentation makes it difficult for entrepreneurs easily to comprehend the system or to approach the right channels for their financing and support needs.¹⁵³ The problem is exacerbated given that the fragmentation largely takes place horizontally. Thus, the inexperienced entrepreneur will repeatedly have to negotiate the interfaces between various organizations. From a company perspective, it has to sell itself several times to a number of related government agencies.¹⁵⁴ This creates delays in the process and wasted efforts at a time where the young firms are likely to face major managerial demands on its scarce time. The collaboration between government organizations is important but its dereliction comes at a cost incurred primarily by the applicant company.¹⁵⁵ In comparison, e.g. in the SBIR program in the United States, there are also many organizations involved. However, from the perspective of individual company applicants, the organization remains the same (depending on the industry sector) and there are clear performance milestones to be met rather than new organizations to negotiate at each stage of the development process.

151 (e.g. Armour et al., 2006; Cumming et al., 2006a; Gilson, 2003; Hyytinen et al., 2003d; Mason et al., 2001; Maula et al., 2003a; OECD, 1997; Paasivirta et al., 2004).

152 (e.g. Georghiou et al., 2003; Grönholm, 2006; Hjelt et al., 2005; Hyytinen et al., 2003e; Maula et al., 2003a; Paasivirta et al., 2004; Saapunki, Leskinen, & Aarnio, 2004)

153 However, it has been rightly pointed by some interviewees, that smart entrepreneurs will find their way around the system.

154 From the asymmetric information perspective, it is hard for a new investor to assess the prospects of a young innovative company. Therefore, the certification role of existing investors and their continued commitment are extremely important for being able to attract new investors and other partners (see e.g. Hsu, 2004). For instance, in the SBIR program in the United States such a certification role has been considered to be a very important feature (Lerner, 1999).

155 There is evidence even from competition between the agencies, although the evidence is limited to a very small number of cases. However, the threat of competition has been considered as a serious problem (Grönholm, 2006).

Undervaluation of the critical role of world-class competencies.¹⁵⁶ It has been widely acknowledged that financial capital is just one element of the venture capital process. The best venture capitalists are not primarily defined by the size of funds at their disposal. Indeed, some of the very best VC partnerships are very wary of taking in new limited partners and increasing in size of funds under management beyond what they believe is for them an optimal scale. Rather, the most important ingredient is the superior ‘human capital’ represented by the skills and experience of the investment teams (e.g. world-class serial entrepreneurs). Some of the most effective general partnerships have now raised five or more funds over the last fifteen years. This represents a huge accumulation of industry, financial and technology experience. In Finland, there are still only a few investment managers that have undergone a full investment cycle with more than just a handful of portfolio companies. This is to be expected from ‘home grown’ investors when the industry has a history of less than a decade. No Finnish early stage funds follow a popular US practice of “entrepreneur in residence”. That is the speculative backing of experienced entrepreneurs who are presently seeking a new business opportunity with the active support and encouragement of the VC fund managers. The Finnish venture capital industry is still relatively inexperienced and, as a consequence, remains relatively conservative in behavior.

Excessively modest (and parochial) ambitions. Government agencies often-times appear to assume that they see a majority of the deal flow available to the innovation financing system and build their view of the market based on the deal flow they receive and companies they finance. However, companies tend to seek financiers and advisors they believe can help them reach their goals and particularly some of the most growth oriented born global ventures may not find the public structures that require months to get tens or hundreds of thousands very relevant when they are competing with global ventures starting in the USA and elsewhere raising millions within the first years. The reality in a small economy is that investment volumes and risk taking that can be generated through a public system are not compatible with what is needed to ensure the likely outcome of a stream of internationally successful companies over time. This raises important issues as to the nature and geography of the frontiers of the Finnish innovation system. As we have argued, the Israeli innovation system is considerably more international and pro-active in its definitions of operating scope and public interests.

Potential conflicts between innovation and regional policy execution. Finvera’s remit largely centers on regional policy whereas the responsibilities of FII, Tekes and Sitra are focused on innovation policy rather than location issues. However, these agencies use similar risk capital and debt instruments to pursue their

156 (Teubal et al., 2006)

objectives. The use of similar instruments from different providers is likely to precipitate duplication of effort. In the existing case of Finland, where the same instruments are offered by multiple providers but at different required rates of return to potentially identical young firm clients, the stage is set for inter agency rivalries. On occasions, it is almost inevitable that there will be direct competition between different public providers, as noted recently by many observers. Over time, the opportunity for such ‘skirmishes’ will increase even in an ordered and professional administration. The limited existence of regular multi-lateral discussions between the four major agencies at the highest management levels removes one important means of adjudication and pragmatic resolution from the public financing system.¹⁵⁷

Proposals for merging of public support services. In the interviews, almost all possible merger combinations of the government activities were casually suggested by one or more interviewees to reduce the complexity and fragmentation and to improve the efficiency of the system. More concretely, in fall 2006, Sitra made a proposal for the government suggesting a merger of Sitra PreSeed activities, the Seed Financing Programme of the Finnish Industry Investment, and Seed Fund Vera Ltd to create a single company owned equally by Sitra, Finnish Industry Investment Ltd. and Finnvera/Veraventure. In the proposal it is suggested that current employees of the three separate programs would be recruited to run the new management company. The key logic in the suggestion was to bind the matching and development activities of Sitra PreSeed (INTRO, DIILI, LIKSA) to public funding activities (FII and Avera). The proposal suggests several advantages such as more streamlined provision of public finance, pooling existing expertise and resources, combination of investment readiness development, business angel networks and public finance, as well as a critical mass and contacts for European collaboration including a potentially better access to EIF funding. The proposal concludes that there are not likely to be any reasons why such a merger would not be implemented. However, several considerations have been raised, some of which are listed below. The list is described not to make a case against this or any other consolidation between public finance agencies, but rather to show that there are many important considerations despite the potential benefits such an amalgamation may yield.

- The proposed new entity owned equally by Sitra, FII and Finnvera could be viewed as creating yet another public funding organization in the Finnish innovation system. From a customer perspective, this change might reduce the number of organizations with which an entrepreneurial firm has to deal. However, if the company also uses other funding sources from Finnvera, Sitra, or FII, which is quite possible un-

157 Bi-lateral discussions do occur regularly in the system. The point being made is not all of the agencies participate in a regular forum where such potential conflicts can be discussed, and resolved, at an early stage.

der the present system, there is likely to be little real reduction in time commitments or in the overall complexity of the system as viewed by inexperienced firm applicants.

- The creation of a single company may further raise the specter of creating a quasi-monopoly provider of Finnish public seed capital in the absence of sufficient number of private and fully commercial financiers. The lack of alternative providers could mean that if one organization does not like the business proposal of the applicant there are now no longer any other alternative source of public funds to which the entrepreneur could apply.
- The increasing integration of public support services combining matching services and direct public funding via supported early stage funds can be problematic for the healthy development of the market. For some companies being matched and invited to accept public investment might be a highly desirable course of early stage support. But for many other vigorously entrepreneurial and independent firms such public ownership and influence may be seen as a major disincentive or constraint on their autonomy of actions. While there is a great need for support in matching entrepreneurs and investors, there are indications that combining the match maker and the investor roles is likely to cause some adverse selection and lack of transparency in the operation in the operation of the matching market.
- It is no trivial task to merge together the personnel of three quite disparate organizations. The literature of M&A and takeovers repeatedly observes that good economic plans can be brought to their knees by 'soft issues' of conflicting or immiscible cultures. It would be unwise to assume common and congruent interests among the staff from the three replaced programs who 'survive' to manage the new entity.
- Current research tells that the most important success factor in first-time early stage venture capital funds is that where the investment team includes both serial entrepreneur(s) and experienced venture capitalist(s) working in active collaboration.¹⁵⁸ In Finnish public funding organizations such arrangements remain exceedingly rare. There is no present indication that the proposed merger would change this situation for the better.

4 Conclusions and Recommendations

4.1 Conclusions

Almost unanimously, all interviewees considered the question of how the public financing of young innovative companies could best be developed as both important and relevant. The widespread perception that the public financing and developmental support for young innovative companies in Finland is fragmented and becoming more complex to understand or use has also been stated in several recent evaluations.¹⁵⁹ However, there is not a clear consensus of opinions on how public support for young innovative companies could best be improved and streamlined. Several experts with more than a decade of experience in the area simply felt that there is too little funding available to start-ups and young firms at the early stages of their development. Improving this shortfall was deemed by such respondents as the first priority. The specific nature of the funding mechanisms was considered to be of secondary importance. In contrast, some stakeholders opined that in Finland there are no serious problems in the availability of finance citing e.g. the situation of average SMEs reported in the two regular barometers that show that only a small percent of SMEs consider the availability of finance is a serious challenge. Such persons tended to argue that “good ventures always get funded”. However, such opinions were rare among our interviewees. In direct contrast, most of those who paid closest attention to the contemporary funding mechanisms in Finland and who had specialist (and international) knowledge of long term developments in the financing of young innovative companies were often the most critical of the present situation. They were much more likely to point out and detail problems in existing finance mechanisms including the limited incentives put in place to encourage individual entrepreneurs to engage in risky ventures and to invest the considerable time and effort necessary for the successful growth of portfolio companies. In the end, nearly all interviewees agreed that there is a very clear need to ensure the primacy of a well functioning, privately led (i.e. commercially driven) market. Given this view, the pre-eminent role of the government becomes focused on providing the enabling environment that will allow informed and transparent markets to work efficiently.

159 See e.g. Grönholm (2006) Georghiou et al. (2003), and Paasivirta et al. (2004). The problem is not new. Already a decade ago it was concluded in a survey that the lack of information concerning existing support services was the most serious gap, not the adequacy of available support services itself (Autio, Jutila & Kivisaari, 1995). Although some new steps have been taken towards reducing the fragmentation during the past few years such as the new service Enterprise Finland (<http://www.enterprisefinland.fi/>), a portal of Finnish government agencies supporting innovation and entrepreneurship, it appears based on interviews that introduction of new partially overlapping instruments has amplified the perceived fragmentation and created some unnecessary tensions.

The clearest need for the financing of young innovative companies expressed by the interviewees was to have more Finland-based, industry focused, and properly resourced private VC general partnerships with world-class competencies and strong international connections to help ventures grow and internationalize. The requirement from such companies is to follow the example of their US peers by making initial investments in young innovative companies at the startup stage and being prepared to aggressively follow on invest and support their portfolio businesses to rapidly achieve an international commercial presence and, thus, the conditions for commercially attractive exits.¹⁶⁰ A common fear expressed by many was the government's investor role becoming too dominant and in real danger of crowding out both current and future private investment activity.

One important challenge in the public financing of young innovative companies relates to globalization. On one hand, public investors invest taxpayers' money and will always consider the primacy of benefits to the Finnish economy. A common approach has been to view with some suspicion any serious dilution of Finnish ownership, e.g. the sales of successful Finnish companies to foreign acquirers.¹⁶¹ On the other hand, a successful innovation is an invention that is widely and profitably taken up. In high technology products and services, the markets are meritocratic and increasingly global. To many users, it is irrelevant if the technology is derived from Finland, the US or China so long as the product or service performs in an expected and cost efficient manner. The global nature of markets and the increasing need for scale in order to develop and to gain sufficient returns from high cost and still risky technical developments poses a problem for Finland and other developed but small economies.¹⁶² There is little room (and negligible commercial logic) for a domestic-only 'high tech' company. This is particularly the case in Finland where the domestic markets generally represent less than one percent of the equivalent global markets. Furthermore, building global sales channels is an extremely risky, expensive and long term commitment for a new venture. Therefore, examples where a Finnish venture has first developed a leading technology, built its own global distribution channels and then has been able to take a significant global market share in its segment – are very few indeed. Much more common and practicable routes to international markets involve arrangements

160 Such new funds were warmly welcomed even by such private VCs with whom such new funds could potentially compete. The emergence of new industry focused value adding investors with global perspective were unanimously seen as important to improve the entrepreneurial dynamics and make the building of world-class ventures more feasible and a more attractive opportunity for individuals with world class competencies and experience.

161 E.g. the press release of the Ministry of Trade and Industry" Teknologiatukien takaisinperintään tulossa täsmennyksiä". 17.10.2006, Ministry of Trade and Industry, Helsinki, Finland.

162 Israel and Ireland could be cited as two countries with few large indigenous businesses in relation to the size of their economies.

which include joint ventures, mergers and acquisitions with foreign entities. Here, real and large scale value is created by combining superior Finnish technology, including design and application experience, with the existing global distribution channels and complementary resources of world class partners.¹⁶³

In the following section, we provide a brief synthesis of our answers to the research questions which we were requested to address in this project. Our responses are informed by the above analysis.

1 To what extent does the large number of public finance organizations cause problems particularly in the development of young innovative companies and how could these problems be reduced or eliminated?

There is some variation between countries as to how centralized is the public financing of young innovative companies or indeed SMEs in general. In Finland, the support system is clearly quite decentralized with several strong and relatively autonomous public organizations providing public finance for SMEs. However, there are some potential problems in the large number of partially overlapping public agencies.

On one hand, the relatively large number of public finance organizations in Finland:

(1) requires an unnecessarily large share of the attention of stakeholders, including entrepreneurs and their financiers, in order to navigate between and collaborate with several alternative domestic support organi-

163 For instance, Israel views the role of foreign exits as positive because they have lead to a large number of large multinational corporations creating R&D centers in Israel and \$20bn from sales of Israeli companies to foreign investors + \$7bn from foreign IPOs + \$16bn capital raised by Israeli VCs and foreign VC investment in Israeli companies (over 50% of investment by foreign VCs, 133 foreign VC funds invested in more than one company in Israel from 2000-2004) (presentation by Yoram Oron, Managing Partner, Vertex Venture Capital, Chairman of Israeli Venture Association in Helsinki on November 8, 2006 and a recent evaluation by Economic Models (2005)). Referring to the benefits of acquisitions by foreign multinational firms, De Fontenay and Carmel (2004) conclude “Thus, the Israeli firms were able to realize large financial rewards from their innovations without having to successfully reach final customers.” Teubal et al (2000) consider that mergers and acquisition process serves as a shortcut to the market allowing more Israeli firms to enter and realize profits than would otherwise have been possible. Mason and Harrison (2006) found in an analysis of five Scottish technology-based firms that were acquired by non-UK companies that such exits have lead to valuable “entrepreneurial recycling” of wealth and experience which has been ignored in most of the prior research. Molander (2005) analyses both Finnish cases and European data and finds that foreign trade sales exits create more value on average than domestic ones given the synergies in leveraging a strong technology base of the target company with the global distribution channels of the bigger international acquiring company. Bertrand and Zuniga (2006) conclude their results on OECD countries: “This result casts some doubt on the usual fears regarding foreign takeovers and their impact on local R&D activity.” A recent review of acquisitions or mergers of Finnish wireless technology companies with foreign companies such as Smartner with Seven Networks, Hybrid Graphics with Nvidia, Bitboys with ATI Technologies and Sumea with Digital Chocolate also resulted in similar positive conclusions (Digitoday 27.9.2006 “Companies remain, competencies recycled: Mobile work grows in Finland with foreign funding” (authors’ translation) http://www.digitoday.fi/page.php?page_id=12&news_id=200616151)

zations. This takes up valuable management time that could better be used by growing firms in serving the needs of customers and their international partners;

(2) diverts publicly allocated resources from their proper purpose of supporting young Finnish ventures to managing the costs of the collaboration with other public support organizations. Such complexity obliges entrepreneurs to adopt an overly domestic and inward orientation;

(3) increases the misalignment of resource allocation between development stages of companies given that firm clients need to contact different agencies focused on different stages of development (with little sector specialization);

(4) increases fragmentation of policy delivery;

(5) reduces the responsibility and accountability of public support organizations given their entrepreneurial development remit; and

(6) creates uncertainty and competition between agencies for finite public budgets. This, in turn, leads to the agencies directly lobbying for political support.

One the other hand, it is clear that having just one potential public financier ('monopoly') could also be harmful in the absence of sufficient number of strong enough private investors. In venture capital, beauty is often in the eyes of the beholder. The value of a new enterprise or novel idea significantly depends on the investors' capability to understand its potential, their risk preferences and their ability and willingness to help realize the ambitions of the young enterprise. Thus, a vigorous early stage financing industry needs heterogeneity of skills, experience and opinions. In short, effective markets are characterized by choice. Instead of taking a passive role and relying on arbitrage i.e. buying assets undervalued due to information asymmetries, early stage venture capital activity is about helping create and nurture new value. Competition in high-tech is global and advanced technology can become obsolete very quickly. Ventures need to be scaled rapidly when the timing is right (not too early, but not too late either). Such timing is an 'art form' learned from considerable professional experience (including failure!).

Good public support mechanisms need to understand the evolution of nascent companies over time and the different challenges they face at start up, early stage development and beyond. The Finnish innovation support system needs to appreciate that depth of support over time is at least as important as providing resources to merely start new enterprises. The key activities are advising, supporting and

promoting those very high potential businesses that have internationally valuable resources in novel products and technologies until such times when rapid growth becomes endemic and sustainable by the firm from market returns alone. Thus, the Finnish support system needs more vertical focus rather than its present, primarily horizontal replication of several agencies working in virtually the same space.¹⁶⁴ Effective support needs to ensure not just the provision of generic consulting services but, preferably, young innovative companies' access to highly skilled and internationally experienced management and board members incentivized and committed via co-ownership and board responsibility.

All of the agencies reviewed in this report have done an important job of supporting entrepreneurial activity in Finland during a recent period of considerable challenge for early stage investors in new enterprises. Yet no public system can 'rest on its laurels' in aggressive and dynamic world markets. Over the longer term, the Finnish support system needs to change, sometimes radically, in order to reflect future circumstances and new challenges. There appears to be some room, and need, for the consolidation of existing services.

It is clear that the organizational structures, the principles and management preferences of the agencies, EU notification requirements and other external factors may be used as plausible arguments to delay action on the choice of alternative ways to address market failures in the finance of young innovative companies. However, we stress that it is the responsibility of the Ministry and the government to ensure that such short term constraints do not prevent or impede the major changes necessary to support the continuing effectiveness of the Finnish innovation system over the longer term. The state through its responsible ministries needs to show strong and unequivocal leadership in the execution of such changes. In guiding long term development, we propose that the government (primarily the Ministry of Trade and Industry and the Ministry of Finance) creates an advisory panel: the Young Innovative Company Finance Task Force. This independent panel would consist of industry experts recruited to give independent advice and counsel directly to government for the purpose of ensuring the continued development and relevance of the Finnish innovation financing system within a global context.¹⁶⁵

164 With this we do not mean that government should necessarily place bets which industries or technologies are going to be winners, but instead of having a myriad of different products and providers for each company in different stages, the support should be more customer oriented, milestone based and better connected to the global industry understanding.

165 Such a forum has been found very relevant and useful in the United Kingdom in advising government in the development of the British venture capital market. For details on the Small Business Investment Taskforce in UK, see <http://www.sbs.gov.uk/sbsgov/action/layer?topicId=7000000164>

- 2 *Is the division of labor between public finance organizations clear and appropriate, is their collaboration coordinated sufficiently from the perspective of individual client companies, and/or how the coordination could be improved?*

Based on interviews and other related evidence, it is our view that the division of labor and responsibility between agencies could be further improved. Its present configuration is not optimal – but nor is it catastrophic. That these public agencies have helped make Finland one of the most innovative economies in the world is a cause for genuine pride. None the less, the challenge is to turn the nation’s world class inventions into a stream of profitable innovations. This second goal has not been achieved. The present structure of public finance and support needs to be regularly appraised, and changed where necessary in order to meet these major future challenges. Some recommendations are provided in Chapter 4, Section 2. However, we want to stress that we do not believe that a single transaction to consolidate some existing activities would be alone a sufficient solution to the development of the availability of risk capital for young innovative companies in Finland over the next five to seven years. Some streamlining of the public finance may be a part of the evolution over the next five to seven years, but it is clearly not the sole or perhaps even the key issue in our opinion. Catalyzing more high quality private VC funds and business angels is a more important task to be kept in mind.

- 3 *What problems does the limited availability of private finance/private financiers cause in the finance of young innovative companies, how could those problems be reduced, and how could the willingness of private investors to invest in young innovative companies be improved?*

In our view, the current limited availability of private finance/private financiers for growth oriented, young innovative companies is a major challenge for the productivity of the Finnish innovation system. As argued above, the disappearance of many private financiers after the market crash in 2000 forced public organizations to step into a common problem area. It has been this uniform (and legitimate) public response that has largely caused the current perceived overlaps between the agencies.

In addition to a reduction in risk capital, the dearth of private investors also reduces the entrepreneurs’ access to the (sometimes equally or more valuable) advice and support from experienced and professional investors. Substituting the missing private investors with public organizations has reduced the value added received by talented but inexperienced entrepreneurs alongside the funding. This loss of advice and experience from professional investors is likely to influence the type of companies that are established, seek external funding or are eventually funded. Some currently successful ventures would not have been established unless the

founders (usually in high flying careers elsewhere) had been prepared to place considerable faith in the quality of advice and stewardship available from venture capitalists whom they believed could help the startup to advance rapidly to global markets. Without deep personal experience and strong incentives, it is hard for professional investors to justify the levels of risk taking typically undertaken in the United States and Israel. As noted above, risk capital in Finland is dispersed among relatively more companies but in smaller stakes. Low availability of private funding also prevents young firms benefiting from public funding when the former is a condition of public support.

Encouragement of new private investors with world-class skills and quality of experience should clearly be a primary goal in the development of the Finnish risk capital market. This was perhaps the clearest common message that emerged from the interviews. The biggest fear for many was increased government domination in the financing of young innovative companies with little focus on the necessary skills and incentives for high quality entrepreneurs and private investors. More serial entrepreneurs and private investors are needed to actively and aggressively seek out new commercial opportunities from Finland's as yet under-exploited innovation system.

4 *What conclusions can be drawn from the recent development trends in public finance of young innovative companies in comparable countries?*

As summarized in Chapter 2 Section 3, there is some variation between countries in terms of the centralization of the public financing of young innovative companies. This governmental structure is often a result of 'path-dependent evolution', i.e. historical and political reasons often limit the feasible development opportunities. However, in many countries, there appears to be one central agency that has more integrated and coordinated approach to funding and services for SMEs. This can be compared to the Finnish system with a structure characterized by several strong and relatively autonomous agencies. Similarly, in many countries, there is also a close coordination between tax and regulatory issues and provision of public finance. In the absence of such desirable co-ordination, public finance programs often are used to 'patch up' problems stemming from the tax and regulatory environment.¹⁶⁶

There are also some other important trends or issues that are clearly relevant for Finland. In many advanced risk capital markets (particularly markets that can be

166 UK is a good example of a country with a very close collaboration and coordination in enterprise policy between Small Business Service and HM Treasury.

viewed as successful in producing rapidly growing new companies, e.g. US and Israel), there is much stronger reliance on the dominant and leading role of private actors. Such programs include strong incentives to help steer investors' behavior. This system is not prevalent in Finland. Tax incentives, substantial investor rewards for success, and tough and open bidding processes in expediting government venture capital programs are also commonplace in many countries. With the exception of business angel co-investment funds and public finance for very early stage R&D/proof of concept funding, a clear trend in public programs in advanced economies is to use indirect approaches. This allows the state to tap into the best available talent and experience from the professional labor market. Professional investors acting as highly incentivized agents of government make the company level investment decisions and value adding support decisions. Civil servants are, thus, not required to act in a commercial context or role for which they have little experience or training. With a robust and professional selection process for the allocation of public finance to recipient firms, its receipt can act as an external signal of merit or certification. This can encourage further private finance and support, thereby leveraging government finances.¹⁶⁷

In Finland, these issues have been well understood as a result of many publicly funded analyses. However, theoretical understanding has not necessarily been translated into the implementations of relevant policy instruments. Given that Finland has already major challenges in encouraging growth oriented entrepreneurship given both a national disinclination to assume high risk and the country's geographic remoteness from key markets for young innovative companies, the adoption of conservative or inappropriate policies and instruments is a serious limitation. For Finland to gain full benefit from its significant R&D investments, it is likely to have to be as innovative and advanced in its commercial implementation policies as in its scientific research.

5 *How is the finance of young innovative companies estimated to evolve over the next five to seven years and how is this taken into account in the development recommendations?*

Given the cyclical and volatility of the risk capital market, the development of the financing of young innovative companies over the next five to seven years is certainly challenging (and heroic) to forecast. It is a relatively long time period in terms of how the business environment can change. Looking back some seven years to 1999, the dot.com bubble was inflating rapidly attracting new and inexperienced VCs to the market. Since then, the market has experienced a collapse (and a partial recovery) and many new investors and their funds disappeared leaving a

167 Both the SBIR and the SMART awards in the US and the UK, respectively, have generated certification effects with private investors tracking the recipients of public merit grants.

gap in the market. Before 2000, a large number of public VC firms had just been privatized. In the last few years, several new government venture capital functions have again been established. In 2006, venture capital again seems to be on a growth cycle. None of these trends can be guaranteed to be maintained over another seven year period. For good or ill, much of government policy has to be conducted in an environment of extreme uncertainty.

However, compared to the situation before the new millennium, there is much more experience among investors (both public and private) and entrepreneurs. This growth in experience, acting as a virtuous circle, is likely to improve the probability of successful investment activity in Finland. Experience and increased research knowledge should help entrepreneurs and their investors focus on more viable models. It will also increase the awareness in Finland of the necessity to participating in a globalizing venturing community.

Any recommendations on the policy options of Finland for the medium term future should not be based on the authors' ability to 'guesstimate' unknowable future events. Rather, it should be based on a foundation of existing research knowledge and practitioner/policy experience as to desirable elements in policy aimed at developing a sustainable market for the financing of attractive, young innovative companies originating from Finland's innovation and science capabilities. This premise has directed our emphases as to the recommendations presented in the next section.

4.2 Recommendations

It is important to note that our recommendations focus on changes to the Finnish innovation and support system that are specifically aimed at improving the opportunities for, and incidence of, fast growth young innovative firms. While our recommendations will have relevance for publicly financed agencies that currently support the start-up phase of new enterprises, the key policy issue is: how may more young innovative firms be assisted to grow rapidly, and continue to grow rapidly into internationally important enterprises? This question is our foremost concern.

In making our recommendations to MTI, the authors are mindful that changes are made in a context that is neither politically neutral nor without a substantial history. In addressing the brief given to us, we do not refer to the complex political decisions which will necessary influence the execution of our recommendations. We are mindful of these factors but they remain rightly outside our remit. None the less, we would wish to stress that any significant re-organization of an existing and effective, national innovation finance and support system will require considerable political leadership. Entrenched interests will strongly defend present institu-

tional autonomies. They will cite the impressive progress of the Finnish innovation system, to which the existing agencies have clearly contributed, as a reason for, at best, modest and non-disruptive change.

In this respect, we would refer to those exemplar companies that are globally successful in advanced technology and new knowledge-based markets. If there are common characteristics among the leadership of such companies, it is in their shared fear of the potential complacency of success; their recognition that excellence – unless repeatedly reappraised and renewed – is transitory; and their ability to emulate and improve ideas and examples harvested from global sources. We believe that successful nations and their policy makers have to share identical mindsets with such leading companies.

In making our recommendations to the government, it is appropriate to note that the organizational lines of reporting and responsibility by which public agencies are managed appear to be manifold at the executive levels of government. MTI may wish to consider if a revised support structure along the lines that we have suggested should also be reflected in changes internal to the Ministry. To this end, one of our recommendations (see below) is that MTI may well wish to consider the introduction of an Young Innovative Company Finance Task Force (along the lines of the UK's Small Business Investment Taskforce) whereby ministers and civil servants may access a diversity of entrepreneurial skills and experience with a strong practitioner and commercial influence to identify new and timely policy initiatives. Our recommendations are as follows:

4.2.1 Ambitious Goal

Improve the ambition level in growth oriented enterprises and set a national goal to make Finland one of the most vibrant investment markets in the world for investing in and creating and capturing value from young innovative companies. This market should be privately led and provide clear incentives for professional investors as well as for the entrepreneurial owner-managers to invest in and create and capture value from young innovative companies.

Finland has become one of the most R&D intensive countries in the world. It is currently targeting an R&D spend of 4.0% of GDP.¹⁶⁸ As a direct result of the nation's long-run commitment to innovation, Finland's competitiveness has been

168 (Science and Technology Policy Council, 2006). However, Finland has not yet set quantitative goals for access to risk capital. See e.g. European Commission (2005b) for quantitative goals set by several other European countries.

evaluated to be among best in the world for several years.¹⁶⁹ While the achievement in R&D is exceptional, without equally impressive commercialization routines and investment the job is only half done.

In contrast to R&D, early stage VC provision is often compared favorably to EU averages and found to be better than most. Such comfortable acceptance of merely ‘above average’ commitment is inconsistent with Finland’s world class R&D performance. This contradiction between R&D and commercial actions is an anomaly that must be addressed. In short, Finland’s current and future entrepreneurs, including the agencies and partners that advise them, need to be incentivized to be considerably more ambitious in their global commercial goals and achievements. One of the clearest messages that emerged from the interviews was the need to catalyze far greater amounts of value-adding private early stage venture capital and business angel investment in Finnish young innovative companies.

Some potential trend indicators to be considered when assessing the progress of Finland to become one of the most vibrant markets in the world for investing in and creating value from young innovative companies include (1) the number of growth-oriented young innovative companies; (2) the volume of early stage venture capital investments in Finnish ventures as a percentage of GDP compared to the best countries or regions (currently Israel, Massachusetts and California); (3) the share of private investment of the total early stage venture capital activity; and (4) returns to investment in early stage venture capital.

4.2.2 Clear Signals of Commitment

Make a clear statement that high growth entrepreneurship and private risk taking is highly valued and rewarded in Finland. Use tax incentives to catalyze entrepreneurial activity and private investment and to reinforce this signal. Improve the coordination of the tax and legal environments and the provision of public financing in order to facilitate a more effective enterprise policy.

The development of Finland to become one of the most innovative countries in the world has been a result of heavy and consistent investments in R&D over the years, among other factors. Recently more emphasis has been put also on encouraging growth-oriented entrepreneurship which is needed to create value from the

169 E.g. Finland’s competitiveness has been evaluated to be among the best of the world according to World Economic Forum Global Competitiveness Index and Institute for Management Development (IMD) already for several years.

R&D investments. In practice it has meant increased provision of public financing to young innovative companies. However, the crucial role of entrepreneurial intent and the willingness of entrepreneurs and other concerned individuals such as business angels to take significant risk has been largely ignored. The engagement of highly experienced individuals in investment activity has been low, and there has been little focus in enterprise policy on the incentives necessary for the most professional individuals to invest their wealth and experience in young innovative companies.¹⁷⁰

Given that formal venture capital alone is unlikely to resolve the funding challenges of growth-oriented young innovative companies in Finland or anywhere else, business angels and informal venture capital in general has potentially a very significant role as a more appropriate form of equity funding for young innovative companies.¹⁷¹ As a funding mechanism, it can bring both the risk capital and relevant skills sets of experienced individuals to entrepreneurial ventures in order to support their growth and development. Business angels are the predominant source of external, early stage funding to new and young enterprises within the US economy. Thus, personal tax incentives are a very important tool for encouraging informal investment in entrepreneurial ventures particularly when combined with supportive measures such as training of investors and entrepreneurs.

170 The problem has been common in Europe, particularly in the Nordic countries. For instance, based on a large scale quantitative analysis, Da Rin et al. (2006) conclude: "...[European] Paradox [the fact that Europe suffers from an inability to turn scientific competence into commercially successful ventures] seems to be due not to a lack of funding or of attractive technological opportunities, but rather to the difficulties to earn large profits from the creation of new companies." and continue: "we believe our results have a clear message: sensible policy should consider a wider set of instruments than simply channeling more funds into venture capital". This conclusion is supported by related research in Sweden (Henrekson, 2005) and Finland (e.g. Hyytinen & Pajarinen, 2005c; Hyytinen et al., 2005e; Hyytinen et al., 2003d) and elsewhere (Armour et al., 2006). Considering how to facilitate growth entrepreneurship to maintain the welfare state in Sweden, Henrekson (2005) recommends, among others: "...capital gains taxation of long-term holdings of firms where the individual takes active part could be abolished (long-term capital gains taxation is in fact zero in the majority of the EU-15 countries). Such measures would send strong signals to existing and potential entrepreneurs, while costing little in terms of taxes forgone."

171 This was a clear conclusion of the Norface venture capital policy research seminar held in Helsinki in October 2006

Based on a very strongly expressed view in the interviews,¹⁷² supported by available research evidence and experience from other countries,¹⁷³ we believe that well designed tax incentive for business angels or informal venture capital investors in more general could have a significant positive effect both in (1) catalyzing highly needed, informal investments from experienced investors and in (2) clearly demonstrating the willingness of the government to facilitate and reward growth-oriented entrepreneurship and personal risk taking. It is hard to imagine a more credible signal from the government than a tax incentive policy initiative to show that Finland is serious about promoting growth-oriented entrepreneurship by all means at its disposal.

Some potential trend indicators to be considered when assessing the success in commitment to make private risk taking and entrepreneurship acceptable and valued include (1) the development of the entrepreneurial intent in Finland (e.g. GEM research and/or Flash Eurobarometer); (2) number of young innovative companies (3) the share of Finns investing in young innovative companies (e.g. GEM research); and (4) business angel investment as a percentage of GDP.

4.2.3 Open and Global Approach

Leverage all available financial and human resources to the nation's long term advantage regardless of their origin. Invite foreign investors and entrepreneurs to invest in young innovative companies in order to help commercialize rapidly and worldwide Finnish R&D outputs. Innovate new ways to create and capture value from Finnish R&D investments in global markets.

172 In interviews, the most common proposal for measures not yet used was tax incentives for business angels, which was raised by a large number of interviewees. The biggest fear of many interviewees was that early stage investment activity would become largely government dominated activity. Considering tax incentives to catalyze informal venture capital in Finland has been proposed in several recent evaluations and reports (e.g. Grönholm, 2006; Hyytinen et al., 2003b; Hyytinen et al., 2005e; Hyytinen et al., 2003d; Kari, 2005; Kauppa- ja teollisuusministeriö, 2004; Lahti, 2004, Forthcoming; Maula et al., 2005; Maula et al., 2006a; Maula, 2007; Maula, Salmenkaita, & Uusitalo, 2004; Ministry of Finance, 2005; Niemi, 2003; Paasivirta et al., 2004; Science and Technology Policy Council, 2006; Sitra, 2005; Valtioneuvoston kanslia, 2004, 2006; Virtanen et al., 2006).

173 See e.g. Boyns et al. (2003b) and Ward (2006). For a recent review of the literature, see Maula (2007). OECD (2004) concludes: "In general, countries should focus on greater neutrality and reduced complexity in the taxation of capital. In many countries, however, targeted reductions in capital gains tax rates could stimulate the supply of venture funds and increase the incentives to make risky investments."

High tech business is normally global in both terms of customers and competitors – and so increasingly is VC.¹⁷⁴ In most business areas, the Finnish market represents less than one percent of the world market.¹⁷⁵ For young innovative companies in Finland, as well as larger economies like Germany and the UK, a priority focus on international growth is a necessity. Furthermore, Finnish companies currently enjoy a large market share and global distribution channels only in small number of international business areas. Building global distribution channels is expensive, slow, and risky. It is not a practicable choice for other than the largest, established businesses. As a consequence, Finnish R&D will remain underutilized if it relies only on the limited distribution channels of domestic companies. To succeed in global competition as an innovative small open economy, there is little room for reactive protectionism. Ministry and relevant agencies should therefore be careful in their interpretations of the so called “Finnish interest” concept recently added in many regulations of the agencies to avoid creating harmful constraints for the value creation and capture from the Finnish RD& investments.

To make the best use of the Finnish R&D investments, Finnish companies and public organizations should actively develop alternative ways to create and capture value from knowledge assets in addition to the traditional approach of exporting Finnish products to foreign markets.¹⁷⁶ On a company level, this idea is inherent in the so called “open innovation paradigm”.¹⁷⁷ Its adoption by leading companies like Intel, IBM and others with large intellectual property pools has resulted in the development of new collaboration models with leading venture capitalists and other external parties. These new partnerships have allowed companies to convert underutilized inventions into commercially attractive and cash generating innova-

174 (e.g. Baygan et al., 2000; Deloitte, 2006a; Maula et al., 2003b)

175 E.g. for new drug development companies, Finland represents about 0.4% of the world market (Brännback et al., 2004).

176 Summarizing Israeli experience, Teubal et al (2000) conclude: “During the 80s difficulties in accessing specific “complementary assets” (such as those related to ‘implementation’ of R&D results such as assets related to production and marketing) were considered as a important causes for lack of positive profitability of inventors and firms pioneering important innovations (Teece, 1986). One substitute mechanism available today and operative in Israel for accessing such assets (and much less available and widespread then) is acquisition of the domestic company by a large foreign multinational (M&A) possessing such assets. Inventors and associated investors and companies could thereby profit without having themselves accessed complementary assets and without having undertaken substantial commercialization of the invention.”

177 See e.g. Simard and West (2006) for some considerations on applying the open innovation ideas in regional and national levels.

tions.¹⁷⁸ In Finland, it could be helpful to consider implementing similar ideas on a national level given our large R&D investments and IPR base which also contains a stock of inventions that we have not yet been able to turn to profitable innovations (Figure 11 presents the idea in national context). Overall, in a small nation open economy like Finland, the understanding of the crucial role of access to necessary ‘complementary assets’¹⁷⁹ (such as global distribution channels) is critically important to create and capture value from significant R&D investments.

178 See e.g. Microsoft IP Ventures (<http://www.microsoft.com/presspass/press/2005/may05/05-04IPAllBizPR.asp>), and IBM Venture Capital Group (<http://www-03.ibm.com/press/us/en/pressrelease/19042.wss>) were established to monetize intellectual property rights that cannot be optimally commercialized through the distribution channels of the corporations. In Finland, an existing approach with some resemblance to this idea of public agency helping face the information gaps between inventors and potential international commercializers could be the invention market (<http://www.inventionmarket.fi/>) operated by the Foundation for Finnish Inventions. However, there is clearly scope for more effective international collaboration and new approaches to create commercial benefits from the R&D investments.

179 The concept ‘complementary assets’ was first introduced by Teece (1986). For instance in the evolution of the Israeli venture capital market, understanding of the need for access to complementary assets has been central (Avnimelech & Teubal, 2004a, 2004b; Avnimelech et al., 2006).

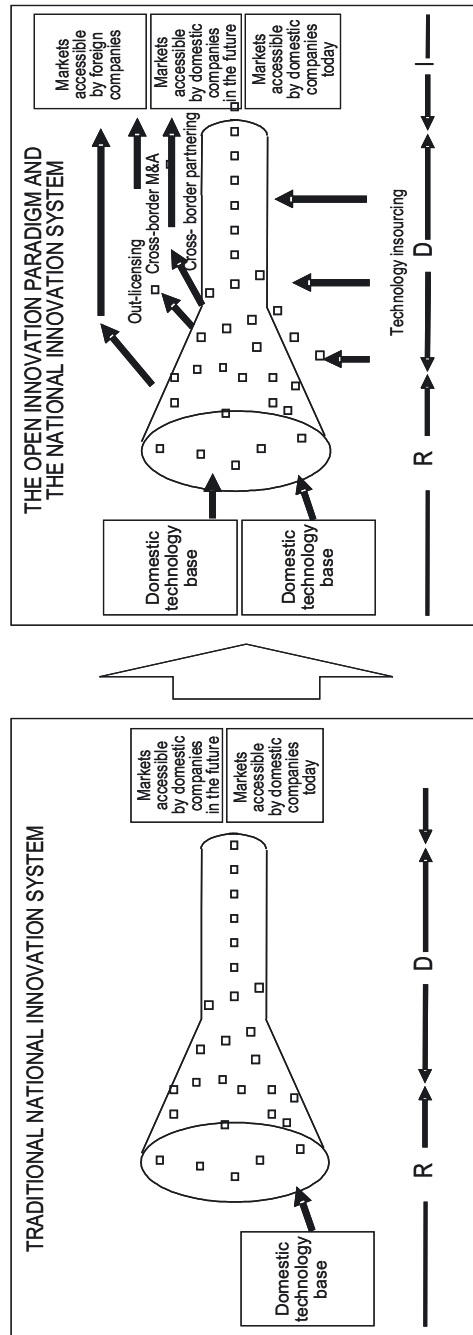


Figure 11. Path to more open approach to innovation¹⁸⁰

180 Framework adopted from Chesbrough (2003) and applied on a national innovation system level

Finland should be increasingly open to leveraging additional foreign financial and human resources in order to help young innovative companies to successfully conquer global markets.¹⁸¹ Cross-border venture capital can play a very significant role in innovative, open economies.¹⁸² It is of critical importance for the success of the Finnish innovation system to be able to attract investors and foreign companies who are willing to pay high valuations for Finnish technology ventures.¹⁸³ Such firms can very materially help Finnish ventures internationalize¹⁸⁴ and facilitate additional funding when needed.¹⁸⁵ However, to be able to attract foreign investors, a necessary condition is often having strong and respected local investors with contacts to foreign investors investing first, signaling quality, and being close to monitor the investment.¹⁸⁶

It is noticeable that in a number of the world's most innovative regions (e.g. Israel, East and West Coast America), immigrant entrepreneurs with high levels of human capital have played a very significant role in establishing growth-oriented ventures.¹⁸⁷ Given the risk aversion and still relatively low entrepreneurial intent of Finns,¹⁸⁸ the potential, commerce-enhancing role of foreigners could be even higher. The importance of indigenous knowledge in target markets significantly increases for Finland when dealing with regions that are geographically remote from Northern Europe.

Regardless of the need for a global perspective in technology and other innovation driven markets, the interviews and other indicators tell a very clear message: the existing international community in Finland and the Finnish communities abroad are currently significantly underutilized. This is partly because of the limited open-

181 An OECD report (2004) concludes: "For smaller countries, integration into global equity flows and the consolidation of secondary stock markets is better than developing isolated national venture arenas." In Israel, about two thirds of the \$1.5bn invested in venture capital comes from abroad.

182 (Baygan et al., 2000; Maula et al., 2003b)

183 (Cardwell & Maula, 2004; Cardwell et al., 1999)

184 (Mäkelä & Maula, 2005)

185 (Hursti & Maula, 2006)

186 (Brännback et al., 2004; Deloitte, 2006a; Maula et al., 2003b; Mäkelä et al., 2003)

187 47% of the current US VC-backed companies have been founded by an immigrant (Anderson et al., 2006).

188 (European Commission, 2004b; Minniti et al., 2006)

ness and accessibility of the Finnish national innovation system.¹⁸⁹ In line with the realities of companies aggressively aiming at global markets and which set English as the single, company-wide language from day one, English should similarly be chosen as the default language for any publicly sponsored activities in Finland that are targeted at supporting growth-oriented, young innovative companies aiming at global markets.¹⁹⁰

There have been various projects and ad hoc efforts to help Finnish young innovative companies to network and identify investors abroad.¹⁹¹ There is room for improvement. The centrality of Finnish companies and their supporters has remained relatively low in international networks. However, there are encouraging new developments. The newly opened FinNode innovation center in Silicon Valley¹⁹² and the FinChi innovation center in Shanghai, and the International Business Acceleration Center (INBAC) in Silicon Valley are visible indications of growing Finnish ambitions. Similarly, Sitra's participation in PreSeed/EASY project promoting cross-border business angel investments in Europe is encouraging.¹⁹³ Likewise, other international initiatives such as the proposed Nordic fund of funds¹⁹⁴ can also be seen as important steps in right direction. However, the openness and global orientation of Finnish enterprise still rests excessively on the shoulders of small number of enlightened individuals and projects. A global perspective and implacable ambition should be made a core value of the Finnish innovation system. As yet, this goal still remains merely an ambition.

Some potential indicators to be considered when assessing the success in improving the openness and global perspective in the financing of young innovative companies

189 As examples, most of the seminars organized by public finance organizations are organized in Finnish without opening them to non-Finnish professionals in Finland or partners abroad. Furthermore, most of the documentation even in high-technology sectors is only available in Finland. For instance, out of publications published by Tekes in 2005–2006, clearly less than a half is available in English. Similar examples can also be found from the most of the other relevant public organizations. See also conclusions and recommendations on making Finnish young innovative companies more accessible for foreign investors and partners in Cardwell et al. (1999).

190 This use of English does not presume that national languages, e.g. Chinese, Spanish etc., will not continue to be essential in individual national markets.

191 E.g. Seed Forum supported by Finpro (www.seedforum.org) and many others

192 FinNode – the new Finnish innovation centre in Silicon Valley <http://www.finpro.fi/en-US/About+Finpro/FinNode.htm>

193 "Sitra's PreSeed to provide expert advice in creating a European-wide market place for initial investments". Sitra press release 15.11.2006, Finnish National Fund for Research and Development Sitra, Helsinki, Finland.

194 (Nordic Innovation Center, 2006b)

include (1) the share of early stage VC investment in YICs coming from abroad and (2) the number of R&D centers of multinational corporations in Finland.

4.2.4 Determined Execution

Remove duplication, fragmentation and unwarranted growth of public services. Improve inter-agency coordination and improve the customer orientation in the provision of public finance.

The role of public finance organizations is to address their objectives, typically the identification and correction of serious market failures. Given the development of the financial markets in Finland,¹⁹⁵ it is important for the organizations to reassess regularly the salience of their role and current activities together with their sponsoring ministry. Over the long time horizon, the success of public organizations that are established to address market failures is ideally measured in their ability to make themselves redundant. Yet, given human nature, few organizations willingly seek their own demise.

Although public organizations can manage overlapping activities through increased coordination, in the longer term it is still important to question whether the effectiveness and efficiency of the public support and finance system could be improved. Clients' take up of extant services is often improved by making the service more understandable. Therefore, one objective to optimize is the simplicity of support systems. Unnecessary complexity should be avoided. The Finnish support system is not simple.

Customer orientation is another dimension that should be centrally important to consider when developing the organization of the public finance of young innovative companies.¹⁹⁶ So far, the structure has been largely product or provider oriented with little coordination between instruments and organizations. Client companies have had to maintain a large number of relationships and provide overlapping reporting just because of underdeveloped and unconnected account management and supporting infrastructure in the funding organizations. So far different

195 (e.g. Hyytinen, Kuosa, & Takalo, 2003a; Hyytinen & Pajarinen, 2003c; Hyytinen et al., 2005d, 2005c; Hyytinen et al., 2003d)

196 With this we do not mean "key account programs" which could further amplify the problems of certain companies specializing for grant seeking (for a description of the problem, see e.g. Hyytinen et al., 2005d; Hyytinen et al., 2003e; Lerner, 2002). Instead, we see a need for better customer orientation and monitoring to ensure better information availability for decision making both to enable right products being offered when needed and to prevent further funding being provided when track record tells it is not likely to be effective.

instruments have often been developed and offered by different providers for each stage of development of client companies. This proliferation of programs and services by separate public agencies has a major cost for young innovative companies. In order to succeed in meritocratic and volatile technology markets, they have to scale up their commercial activities very quickly. Complexities in accessing support services have a high cost for senior management in fast growth enterprises. Rather than having different instruments for each development stage, it would be beneficial to a continuity of agency support based on agreed milestones.¹⁹⁷

For **Tekes**, the suggested future goal in financing YICs would be to become the primary public partner in developing and commercializing Finnish technology globally. Tekes' role would be to act as the specialist provider for growth-oriented young innovative companies. Of the public finance organizations, based on its role and experience, Tekes appears to be according to the interviews in the best position to develop a robust market and technology-focused due diligence process to evaluate and to certify the global competitiveness of the earliest stage young innovative companies given its large scale investments in R&D and teams of specialists with sector specialization. Such an evaluation competency would be a necessary requirement for agencies making direct capital loan investments in young innovative companies.¹⁹⁸ However, development is clearly needed.

First, the current level of global market information and the contact networks employed by Tekes in decision making is insufficient for allocating larger resources more selectively and to support rapid and continuing company development.¹⁹⁹ Development of the selection process including a robust market and technology-focused due diligence process would be highly important. There is a clear need to bring in more global market insight. This may be achieved by the development of internal data resources as well as linking both domestically and internationally with leading venture capitalists, business angels, and other commercial-

197 E.g. SBIR/STTR programs in the United States have three milestones. Each firm has to deal with its sector specialist, not three separate entities that focus on different development stages. For details, see <http://www.sba.gov/SBIR/>

198 So far Tekes has e.g. had a startup capital loan instrument with investments up to €200k (Phase I max €100k and Phase II max €200k. From the beginning of 2007, the Phase II will be discontinued due to the changed De Minimis regulation of the European Commission). If the intent is to increase the size of the investments enabled by the new EU state aid regulation on R&D&I (European Commission, 2006a), the instrument and the selection process should be developed carefully in cooperation with VC industry to ensure the maximal additionality and cost-efficiency (and avoiding adverse selection and moral hazard) and enabling good access to further funding from private sources (and avoiding crowding out private investment).

199 The recent decision of Tekes to merge its international and regional networks appears to be one useful step to the right direction (Tekes press release on December 22, 2006).

ization experts.²⁰⁰ These networks need to be nurtured not only in Finland but even more importantly in the main countries and regional markets targeted by Tekes' client companies.

Second, Tekes should increase its customer orientation in the finance of young innovative companies. Although many individuals within Tekes are seen as very professional and supportive, the service has been found to vary between offices. Tekes could adopt more clear account management teams and supportive information systems that would guarantee good services using appropriate instruments.

Third, Tekes needs to develop a more streamlined and integrated portfolio of instruments to support rapid development from research to proof of concept and early commercialization.²⁰¹

Fourth, a much more open approach is needed to facilitate the global commercialization of Finnish inventions. Tekes should more proactively use all available resources in Finland and abroad to help turn Finnish inventions to commercialized innovations. It should be easier than it is at present for global markets to identify relevant and valuable Finnish technologies. A bigger risk to the Finnish economy is not that Finnish inventions are being misused but, rather, they are not being used at all.²⁰² Given Tekes' new mission to focus more on innovation in comparison to its traditional remit of invention, this will not be seen as a success until a larger number of customers worldwide use Finnish solution/inventions to meet their needs. Tekes should innovatively develop new approaches to help transform Finnish inventions to innovations and thereby help capture financial and other benefits to the Finnish economy. This is also an area where Sitra, Finpro and Invest in Finland play major roles, so close collaboration with them is very important.

For **Finnvera**, the suggested future goal in financing YICs should be the primary public provider of loans and loan guarantees at the local level. Finnvera has strong local presence in Finnish regions and is recognized for its professionalism in the delivery of loans and loan guarantees. Having a regional presence is not the most critical issue when considering the relatively small number of the high growth oriented young innovative companies aiming at global markets to compete with competitors from the United States and Asia among others. Therefore, a decentralized

200 E.g. Hsu (2006) shows that VC involvement in the US SBIR funded companies boosts cooperative activity the likelihood of an initial public offering of the companies.

201 Some suggestions concerning the proof of concept funding in Hjelt, Niinikoski, Syrjänen, Valovirta, and Törmälä (2006).

202 See Hjelt et al. (2006), who also suggest a more open look to international commercialization opportunities.

regional presence is only a limited advantage in making equity investments that are needed in the funding of such companies.

However, in the provision of loans and loan guarantees to small firms a regional presence is highly effective. Equity investments are only relevant for small share of the most growth-oriented ventures while loans and loan guarantees are more relevant for a much wider group of companies. Therefore, in the development areas, it is suggested that Finnvera focuses on this primary activity, i.e. loan and loan guarantees, which is the traditional focus of Finnvera. Second, Finnvera should harmonize operations, investment criteria, and financial instruments between regions. There are currently examples of significant variation in the investment criteria and in the instruments employed between different offices of Finnvera. Third, Finnvera should carefully monitor the need for direct equity investments and prepare for phasing out direct seed (equity and capital loan) investment activity if and when it is no longer needed. This will help avoid crowding out private activity. Companies aiming at rapid international growth can be born anywhere in Finland. However, regardless of their regional beginnings, they should be entitled to receive the best possible support to help them grow and conquer global markets. Therefore, wherever possible, it is important to recognize such exceptional companies early and to direct them to specialist services that are tailored for such companies. This is a better prescription than attempting to replicate such services in every region with little access to global market information and global investor networks.

For **Finnish Industry Investment Ltd (FII)**, the suggested future goal in financing YICs should be to become the most professional fund-of-funds investor catalyzing significant amounts of new privately managed risk capital. There are some areas of organizational responsibility that need further development. First, the fund-of-funds activity should be prioritized. FII should develop a primary role in the creating of new privately managed, venture capital funds and particularly early stage funds. FII should also develop a more robust due diligence process in order to help raise the professionalism of the state supported Finnish funds and to certify their quality.²⁰³ Such improvements will allow these funds to improve their capability to raise funds from both domestic and foreign investors. As Finnish institutional institutions diversify internationally, an important role for FII is to help ensure that corresponding flows from international investors are attracted in funds based in Finland. The challenge is particularly important and challenging for funds with early stage venture capital focus.

203 In the institutional investor community, the due diligence process of European Investment Fund have been seen to provide some certification of the investment grade of the fund. Similarly, venture capitalists feel that the responding to the requirements has helped to improve their professionalism and make it easier to attract investments from other sources.

When investing in funds, the future viability of such funds should first be ascertained.²⁰⁴ Many success factors of early stage venture capital funds are very well known: e.g. world-class experienced and competent individuals (i.e. serial entrepreneurs and venture capitalist skills and contacts), global industry focus and reach, sufficient fund size, and close contacts to leading companies and research institutions in their industry to speed development from research idea to a fully fledged business.²⁰⁵ It is a high priority to be able to actively catalyze world class teams to make informed investments and support their portfolio companies in global competition.²⁰⁶ Second, FII (and MTI) should regularly review the continued need for its different types of direct investment activities and be prepared to phase out direct investment activities if and when they are no longer needed to avoid crowding out private activity and to specialize as a more proactive fund of fund management team.

For **Sitra's PreSeed** activities, the suggested future goal in financing YICs should be to become a more open and effective informal venture capital market place. Sitra's INTRO and DIILI services have been considered as valuable but currently do not reach their full potential partly because of perceived tight control, lack of openness to deal flow, and somewhat unscalable processes. Furthermore, Sitra's present strategy of pioneering new initiatives and then spinning them off after the program period can be challenging in areas that require long-term public support. Therefore, there are some development areas needing attention. First, Sitra should work to find a way to increase the openness, scale and the effectiveness of the INTRO market place. Second, it could be useful for Sitra to consider opportunities to establish the INTRO market based on a non-profit funding model with all relevant stakeholders involved to improve the openness and inclusiveness of the marketplace.

These findings have also important implications for the **Ministry of Trade and Industry**. First, MTI should develop a more integrated management responsibility to remove inter-departmental competition and to create more coherent and coordinated direction. Currently, the supervision and representation of the sister agencies is somewhat dispersed within the Ministry. For instance, each organization has a

204 As a public investor with the key remit to facilitate the creation of new venture capital funds with early stage focus, the role of due diligence should be tough but constructive, i.e. improving the investment readiness of emerging teams.

205 (e.g. Gompers et al., 2006a; Maula et al., 2006a; Söderblom, 2006; Söderblom et al., 2006; Zarutskie, 2006)

206 Israeli Yozma, Australian Innovation Investment Funds, New Zealand Venture Investment Fund program, and UK Enterprise Capital Funds programs of government sponsorship in VC funds have been explicitly planned to support the emergence of new very strong VC teams.

different representative from the Ministry as a board member or no MTI representation at all. Therefore, the boards of these agencies cannot act as an effective mechanism for aligning the separate interests of the organizations and their collaborators. The risk is that they focus too much on developing the longevity and growth of their own organization without taking fully into account what their sister organizations are doing. This organizational responsibility structure is suboptimal from the innovation and financing system perspectives. The Ministry has so far had a parallel supervisory mechanism based on separate supervisory meetings and directions from the Ministry. However, it has become common practice that the guidelines given through this channel have been only partially implemented. This has occurred particularly when the supervisory guidelines have been in conflict with strategies drafted by the separate Boards of the agencies.

Secondly, MTI should review how government could best support enabling infrastructures,²⁰⁷ which are typically difficult to sustain or at least start on fully commercial basis, but which may still be best implemented by independent actors. Currently the innovation system including MTI and Tekes are prepared to fund projects, but not structures, and Sitra also does not consider continuing funding of such operations being its responsibility. However, such enabling infrastructure roles may be far more important and better justified compared to direct investment activities alongside private actors.²⁰⁸

Thirdly, and very importantly, the collaboration between the Ministry of Trade and Industry and the Ministry of Finance should be further developed and deepened to facilitate a more integrated enterprise policy. Although enterprise policy has been seen as primarily the responsibility of the Ministry of Trade and Industry, many of the core areas such as the development of the tax and legal environment

207 See e.g. Hyytinen et al. (2003d). Some examples of such services could be business angel networking, investment readiness training of business angels and entrepreneurs currently carried out by Sitra PreSeed, business plan competitions such as Venture Cup (<http://www.venturecup.fi/default.asp?site=3>, see also Kari (2005)), and internationalization programs such as Global Software (Niinikoski, Valovirta & Kontio, 2006). Of course, potential overlaps with commercial services should be continually monitored to avoid crowding them out.

208 Georghiou et al. (2003) note: "...the public sector may have a relative advantage in carrying out complex tasks the outcomes of which are difficult to measure (e.g. design of policies that take the wider social benefits into account). As a general rule, careful consideration should take place on whether the government could achieve its aims better indirectly by enhancing opportunities, rather than through direct involvement. As an example of a task where the public sector may have a relative advantage is the collection and dissemination of information. To reap the highest returns to such activity, information thus collected should be distributed as widely as possible among Finnish users. This implies that information should be priced at marginal cost. By definition, therefore, such activities cannot support themselves. Credible government impartiality may allow the government to perform tasks that are difficult for profit-oriented firms."

come largely under the control of the Ministry of Finance.²⁰⁹ This latter ministry understandably has focused on ensuring a broad tax base and fiscal neutrality. However, to create a globally competitive environment for employment creation through investments in young innovative companies, a more integrated approach is needed. The government should have an innovation finance system that avoids having to use public finance to resolve problems stemming from the tax and legal environment. It appears that the dialogue and collaboration between the ministries on innovation and enterprise policy has improved during the past years particularly on an individual level. Furthermore, Ministry of Finance has recently conducted some very useful research on the potential to develop the Finnish risk capital market.²¹⁰ None the less, overall Ministry of Finance has little resources committed to consider the entrepreneurship and innovation perspectives. Coordinated development between these two principle ministries could be further strengthened by an advisory panel along the lines of the UK small Business Investment task force as suggested above.

When assessing the effectiveness of the public financing of young innovative companies as a system, in our view progress in the indicators suggested above should provide useful evidence. In addition, more specific impact analyses of various instruments and a continuous assessment of the public system, possibly supported with a taskforce as suggested above, are of course needed.

4.2.5 Final Remarks

Many of the findings and recommendations presented in this report are not novel. Support for greater customer orientation; the use of tax incentives to incentivize experienced individuals to invest their wealth and competence in developing new ventures; and an increased focus on non-financial support in the development of the supply of venture capital have each been regularly cited in a number of independent studies over the past years.²¹¹ Despite of this, there has been a tendency to focus on easy solutions (i.e. invest some funds in a new or existing government or-

209 For instance, many key priorities such as developing exit markets for investors and rewarding success with policies (European Commission, 2006c) fall largely in areas under the control of or at least heavily influenced by the Ministry of Finance.

210 (Niemi, 2003)

211 (Aho et al., 2006; LTT-Tutkimus Oy, 2005; Maula et al., 2006a; Maula & Murray, 2006b; Paasivirta et al., 2004; Science and Technology Policy Council, 2006; Valtioneuvoston kanslia, 2004; Virtanen et al., 2006)

ganization) and ignore the more difficult, but often more important issues for the development of sustainable risk markets.²¹²

In concluding our report, it needs to be emphasized that in developing the public financier of young innovative companies in Finland, the key goal should be developing a thriving international market for Finnish innovation over the next five to seven years (i.e. until the end of 2013). Cycles are difficult to predict, but public policy and related instruments should be developed with this long-term goal in mind, and with flexibility to scale up (or down) according to the market needs. Such goals, we believe, are best met by Finnish companies ultimately being able to compete internationally on their own commercial merits in aggressively meritocratic markets. Public agencies can support such ambitions particularly for the earliest stages of firm genesis and growth. However, at the danger of repeating ourselves, over the longer time horizon, we believe that the success of public organizations that are established specifically to address market failures is best measured in their ability to recognize the transience of their role and make themselves redundant when their public remit is completed.

212 As an example, the problem in the tax treatment of foreign institutional investors (effectively a risk of double taxation) in Finnish venture capital and private equity funds was finally largely solved in 2005 (the new law effective from the beginning of 2006) nearly a decade after the problem was clearly identified and widely known. Yet even the new legislation only partially solves the problem (Nordic Innovation Center, 2006a; Viitala, 2007). There are also many other similar issues reducing the competitiveness of Finland compared to other countries as a target of investments in new funds and ventures (see e.g. EVCA, 2004b; Heikkilä, 2004; Niemi, 2003; Nordic Innovation Center, 2006a; Viitala, 2007)

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List of Interviewees

Autio, Risto, Director, Private Equity Investments, Varma Mutual Pension Insurance Company

Cardwell, William, CEO, Valimo Wireless Ltd

Clarke, Anthony, President, European Business Angel Network, CEO, GLE

Fussing Nielsen, Jimmy, Partner / Technology Ventures, Vækstfonden

Graham, David, Executive Director, LINC Scotland

Grundstén, Henri, Director, Finnish Industry Investment Ltd

Haromo, Miikka, Corporate Finance Director, Collins Stewart

Heikkilä, Pauli, President and CEO, Finnvera Oyj

Hintikka, Martti, CEO, Partner, Innofinance Oy

Honkavaara, Mikael, CEO, Hybrid Graphics Ltd.

Houtsonen, Leo, Managing Director, Veraventure Ltd
Hyytinen, Ari, Research Advisor, Bank of Finland
Jormakka, Vesa, Senior Partner, Argo Global Capital
Jutila, Juha, Executive Director, The Foundation for Finnish Inventions
Kalske, Risto, Director, Sitra, the Finnish National Fund for Research and Development
Kelly, Gerard, Director, Scottish Enterprise Investments
Kukko, Heli, Director, Tekes, the Finnish Funding Agency for Technology and Innovation
Kummu, Antti, Investment Manager, Finnish Industry Investment Ltd
Lampinen, Sami, Managing Director, Partner, Inventure Oy
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Appendix 1

International Experience

A.1 Country Comparison

Challenges related to the financing of young innovative companies have received continuous attention in Europe, the United States, and elsewhere.²¹³ In several parts of the United States, particularly in the Silicon Valley and the Boston regions, the financing of young innovative companies is very developed with the help of vibrant venture capital and business angel communities. Yet even in the United States the fact is that government has had a major role in facilitating the early stage finance.²¹⁴ There are currently major challenges in the financing of the early stage ventures in the US due to the venture capital focus having moved to later stage investments.²¹⁵ Increasingly the role of making seed investments has moved from formal to informal venture capital.²¹⁶ In Europe the situation has been more difficult. Institutional investors have had little interest in exploring commitments to early stage ventures.

Sweden. In Sweden, there are several public organizations providing financing for young innovative companies in different stages.²¹⁷ In the proof-of concept stage, there are many sources of grants e.g. from university holding companies, VINNOVA (Swedish Governmental Agency for Innovation Systems),²¹⁸ Innovationsbron,²¹⁹ ALMI²²⁰ and some other sources. In the seed stage, VINNOVA

213 (OECD, 2006)

214 (Branscomb & Auerswald, 2002)

215 (Sohl, 2007)

216 (Sohl, 2007) and conclusions from the NORFACE Venture Capital Policy Research Seminar II: Breaking Barriers and Mobilizing Resources to Develop the European Risk Capital Market, October 17-18, 2006, Finlandia Hall, Helsinki, Finland.

217 For a more detailed description of the organizations and their budgets, see report by Nutek (2006).

218 http://www.vinnova.se/default___612.aspx

219 <http://www.innovationsbron.se/Templates/157.aspx>

220 http://www.almi.se/almi_in_english.html

and NUTEK²²¹ can provide grants, ALMI can provide convertible loans, and Innovationsbron and university holding companies can provide both convertible loans and equity. In startup stage Industrifonden²²² can provide equity investments or convertible loans alongside business angels and/or private venture capitalists.

Concerning the organizations, VINNOVA's role is primarily related to innovations linked to research and development. NUTEK is a central agency in the Swedish innovation system with diverse activities and around 200 employees in three regions in Sweden. ALMI Företagspartner AB is owned by the state and is the parent company of a group of 21 subsidiaries in each Swedish county (subsidiaries 51 per cent owned by the parent company with other owners being county councils, regional authorities and municipal cooperative bodies). It has is approximately 450 employees. Innovationsbron has provided seed investments since 2005. There are 7 Bridge funds which do co-investing and fund-of-funds activities in separate organizations. The Innovation Bridge Scheme is linked to university and regional innovation system with incubator services offered. Given the newness of the scheme, it is early to make comments about future successes but the scheme is seen as evergreen fund with government top up over time. Innovation Bridge funds will also invest in angel deals. The Scheme has a bit over €200m under management mainly from public sources. Industrifonden, an evergreen fund established in 1979 by the government, has some €350m under management and makes investments in start-up, development and early expansion stages (typically co-investments with other investors with investments ranging from €500k to €5m). Industrifonden can provide both convertible debt and equity based instruments. Industrifonden also acts as a fund of funds investor and has invested in 11 seed and regional VC firms.

In Sweden, there are no tax incentive schemes to catalyze business angel activity. However, business angels have been connected to the Swedish Venture Capital Association. It is estimated that there are some 3000–5000 active business angels in Sweden investing around €160–220m per year.²²³

Denmark. In public finance of young innovative companies in Denmark, state backed investment company Vaekstfonden²²⁴ plays an important role with a capital base of about €300m. Vaekstfonden is both a direct VC investor and a fund-of-funds investor. In addition, Vaekstfonden administers Vaekstkaution, a national loan guarantee scheme for business. Vaekstfonden also initiated the creation of the

221 <http://www.nutek.se/sb/d/113>

222 http://www.industrifonden.se/in_english/about_industrifonden/default.asp

223 (Nutek, 2006). The lack of tax incentives has received critique in Sweden, see e.g. European Commission (2005b).

224 <http://www.vf.dk/ukforside/>

Danish Business Angel Network (DBAN) in 2000. The organization behind DBAN has set up 5 Regional BANs (Business Angels networks), each one associated with a state sponsored technology incubator (Innovationsmiljøer). In 2006, the Technology and Life Science investment activities of Vækstfonden were privatized to be managed by a privately held management company Sunstone Capital owned by its eight partners.²²⁵ With four funds and over €350m under management, Sunstone became one of the biggest VCs in Denmark. Vækstfonden has among its strategic objectives to work actively to facilitate access to international venture capital and drive the development of an internationally competitive private equity environment in Denmark. Vækstfonden has set a goal: “to make the Danish venture market the best-functioning market in Europe.” In 2004, about 25% of the Danish VC funded companies were funded by Vækstfonden.²²⁶ Some identified key development areas in the Danish VC market are: (1) to streamline the commercialization of public research; (2) to increase fundraising at Danish venture and buy-out investors; (3) to extend the integration of foreign markets for venture capital; (4) to improve exit conditions; (5) to strengthen the entrepreneurial incentive.²²⁷ In Denmark, there was also an identified need to develop public proof of concept funding.²²⁸ There is a new Proof of Concept pilot program with €1.6m budget for 2006–2007 focused on this stage.²²⁹

Ireland. In Ireland, Enterprise Ireland (EI)²³⁰ has played a central role in the government support for SMEs.²³¹ EI’s role in the VC industry is to be the agent of the State, and in this regard EI runs the Seed and Venture Capital Programme on behalf of the State. Under the 2000-06 Programme, EI has (1) invited applications for Programme support, which has so far been carried out on an open competitive basis; (2) assessed these applications and selecting approvals for funding (with the assistance of a Seed and Venture Capital Approvals Committee, which includes both EI members and other external public and private sector members); and (3) disbursed of funding to successful applicants and subsequent participation in VC funds as limited partners. Funding support is provided up to a maximum of 50% of

225 http://www.vaekstfonden.dk/?page_id=1599

226 (Vækstfonden, 2006)

227 (Vækstfonden, 2005a, 2006)

228 (Vækstfonden, 2005b)

229 (European Trend Chart on Innovation, 2006)

230 <http://www.enterprise-ireland.com>

231 (Enterprise Ireland, 2005)

total fund size, which is the maximum amount of funding allowable under the EU approval for the scheme.

In addition to EI which focuses primarily on SMEs with 10 to 250 employees and startups and micro-companies with significant growth and internationalization orientation, other significant public actors include 35 City and County Enterprise Boards (CEB) which provide financial and non-financial supports and assistance to micro-enterprises in their respective areas; Business Innovation Centres (BIC) operate in five cities providing primarily services for SMEs; FÁS which is the State training and employment authority; LEADER, the EU Community Initiative for Rural Development which provides approved local groups with public funding to implement multisectoral business plans for the development of their areas; and Údarás na Gaeltachta which works to develop the economies of Gaeltacht areas and to encourage the preservation and extension of Irish as the principal means of communication in the Gaeltacht.

In Ireland there is general acceptance that the roles of Enterprise Ireland, the City and County Enterprise Boards and the other enterprise-related entities are relatively well established and defined at the strategic level – that is, there is clear understanding of the broad remit of the agencies, and the eligibility for support from the agencies. However at a more operational level, concerns have been raised regarding possible duplication and overlap of services, as it is possible for some companies to meet the eligibility criteria of different agencies. Therefore, despite recent memorandums of understanding and agreements between agencies, some recent evaluations have recommended improved coordination.²³²

United Kingdom has the most developed venture capital and private equity market in Europe with a long history, e.g. 3i plc starting in 1945. The UK venture capital industry has its origins in the early 1980s with the advent of a government under Margaret Thatcher with a very strong remit to increase the role of free markets in all aspects of UK economic life. The UK has remained the single largest venture capital market in Europe although this dominance has increasingly been the result of the very large, international private equity industry operating out of London and focusing on MBO opportunities worldwide. The success of private equity as an assets class has left a clear lacunae in the earlier stages of risk capital finance.²³³ The British example largely reflects the prevailing situation in Europe with later stage deals being the dominant product across the venture capital and private equity

232 (Small Business Forum, 2006)

233 (Harding et al., 2003)

product portfolio. Unlike much of the rest of Europe, the UK economy shows several signs of growth in a burgeoning informal investor (Business Angel) market.²³⁴

The British government has had a strong and determined approach to “Making the UK the best place in the world to start and grow a business” implemented in close collaboration between the DTI’s Small Business Service and HM Treasury.²³⁵ Accordingly, the UK has made a very public commitment to Entrepreneurship as an important plank in economic (and social) policy and has promoted a range of policy instruments and incentives to increase participation in Entrepreneurial activities. It is important to note that in the UK Entrepreneurship policy has been personally and very publicly adopted by both the Prime Minister and the Chancellor of the Exchequer. The two most powerful politicians in the UK since 1997 have consistently supported a free market, entrepreneurial policy stance that has as strongly reflected US rather than European experience. Policy initiatives have spanned increased entrepreneurship education to both students at schools and universities; support for social entrepreneurship in disadvantaged communities; fiscal incentives for informal investors and retail investment funds focusing on young businesses; as well as a major program of direct financial support to address ‘equity gap’ issues via a number of UK government supported venture capital funds.²³⁶ The three most important of these direct VC fund activities in terms of scale of involvement and public funds committed are the UK High Tech Fund (a fund of funds structure); the Regional Venture Capital Funds; and the Enterprise Capital Funds scheme.

If there is a single prevailing characteristic of UK venture capital policy since the present government’s incumbency in 1997, it is the commitment to a market mediated solution to address shortcomings in the supply of early-stage venture capital. This philosophical as much as economic policy position is based on the belief that government should not and cannot ‘second guess’ market behavior. The paramount role of the state is to provide conducive environments for private activity to occur efficiently. Above all, the state should not attempt to become a professional venture capital investor in a market already populated with more experienced in-

234 The dot.com ‘bubble’ and the associated severe market correction in over-priced technology stocks in 2001 had a devastating effect on Business Angel investor returns. This activity had grown rapidly in the late 1990s with several virgin angels entering the market. Many of these new and inexperienced early stage investors were ‘wiped out’ in the 2000–2001 period. The UK market is only just recovering from this experience. It remains a fragile and immature market.

235 (Small Business Service, 2004b)

236 It should be noted that within the growing movement for national autonomy within the UK, England executes government policy through the conduit of nine Regional Development Agencies. Scotland, Northern Ireland and Wales operate a number of different (albeit often similarly focused) programs through their own enterprise agencies.

vestment professionals.²³⁷ This stance closely reflects US policy enacted through the Small Business Administration and particularly its Small Business Investment Company (SBIC) program. The latter ‘equity enhancement program’ has been adapted in the designing of both the Regional VC Funds and the Enterprise Capital Funds programs in the UK. At present in the UK, there is no significant venture finance activity undertaken by public civil servants rather than by private sector investment professionals. It is highly unlikely that this policy stance will be reversed.²³⁸

The UK government has further removed itself from direct investment activity by setting up an independent governance structure, The Capital for Enterprise Board, to oversee its public commitment to extant programs and funds since 2006.²³⁹ The CEB was formed to remove government civil servants from the danger of slipping into an active investor role as a limited partner in several public-private schemes. The CEB is staffed by investment professionals from the venture capital industry employed on a professional and incentivized basis to manage the state’s equity and debt interests.

This arms length position of the state may also be seen in the informal market incentives. The Enterprise Investment Scheme (EIS)²⁴⁰ incentivizes entrepreneurs via both an ex ante relief on taxable income and an ex post advantage through a reduced capital gains tax. Similarly, the tax efficient Venture Capital Trusts offer a solution for private investors via the vehicle of a professionally managed fund. Again, a clear guiding principle has been to leverage the skills of private professional investors as much as possible towards governmentally desired policy goals.

The UK has frequently been seen as one of a number of countries at the forefront of entrepreneurial policy. However, crafting a coherent set of SME/entrepreneurial policies within the different agencies of the state is difficult particularly given the changing loci of power in different government departments. The National Audit Office criticized the UK government for having 15 departments managing 265 programs providing (in theory) some 3000 support measures to small business. The Small Business Service was censured for not providing a more robust co-ordi-

237 There is a different argument that Europe at large does not have sufficiently high caliber, professional investors in early stage technology activity comparable with the best funds in the USA (or indeed Israel).

238 The role of the Small Business Service is currently being reorganized with the service likely to have a more indirect and research based role in government on small business issues. In this reorganization, there is no indication that the current policy stance on using private market agents for VC investment activity in areas of public interest will be reversed.

239 “Capital for Enterprise Board Announced”, Small Business Service press release on July 21, 2005.

240 (Boyns, Cox, Spires, & Hughes, 2003a), see also <http://www.hmrc.gov.uk/eis/eis-index.htm>

nation function. The adequate monitoring of the effectiveness of its policy measures was also criticized. However, the NAO also acknowledged that the SBS is only responsible directly for £170m expenditure in a government spend on small business of over £2.6bn.²⁴¹

United States has without question the most developed risk capital industry. In particular, the Silicon Valley area in the West coast and the Boston area in the East Coast are global centers of venture capital. In a recent analysis²⁴² of the sources of funds for early stage technology development, it was found that most funding for technology development in the phase between invention and innovation comes from business angel investors, corporations, and the federal government. Venture capitalists were quite marginal. Even in the USA, the markets for allocating risk capital to early-stage technology ventures were not considered efficient. Consequently, many institutional arrangements have developed for funding early-stage technology development. This suggests that funding mechanisms evolve to match the incentives and motivations of entrepreneurs and investors alike. The study also found that the conditions for success in science-based, high-tech innovation were strongly concentrated in a few geographical regions and industrial sectors, indicating the importance in this process of innovator-investor proximity and networks supporting people and institutions.

Overall, the study found that the federal role in early-stage technology development was far more significant than were expected. Central federal funding sources include Advanced Technology Program (ATP) and Small Business Innovation Research (SBIR) program. ATP was created to foster collaborative technology development of high-tech industrial products with the potential to foster significant future economic growth. The Small Business Innovation Development Act of 1982 created the Small Business Innovation Research (SBIR) program. ATP and SBIR are cost-shared R&D programs, not investments in private equity, but they are designed with the expectation of commercial exploitation of the R&D performed in the firm. The SBIR program is described separately below.

Concerning the public financing of small business, the U.S. Small Business Administration (SBA) plays a central role. It was created in 1953 as an independent agency of the federal government to aid, counsel, assist and protect the interests of small business concerns, to preserve free competitive enterprise and to maintain and strengthen the overall economy of our nation. In addition to the SBIR program, it has administered The Small Business Investment Company (SBIC) program since 1958 to fill the gap between the availability of venture capital and the

241 (National Audit Office, 2006)

242 (Branscomb et al., 2002)

needs of small businesses in start-up and growth situations.²⁴³ At the end of FY 2005, SBA had over \$6.3bn invested in 418 funds, plus another \$5.1 bn in outstanding commitments. Together with private capital topping \$12 bn, the program totals over \$23bn in capital resources. In the program, the government itself does not make direct investments or target specific industries. Essentially, the SBIC program is a “fund of funds” meaning that portfolio management and investment decisions are left to qualified private fund managers.

Israel. Outside the USA, Israel is arguably the most cited national venture capital industry in the world. Its distinction is having the largest early stage investments as a percentage of GDP (Figure 5) with the total venture capital investment in Israeli technology companies estimated to reach \$1.5bn in 2006, 2/3 of which comes from foreign investors.²⁴⁴ Israel is also credited with having arguably the most successful single policy program designed to stimulate venture capital: namely the Yozma program (1993-1997).²⁴⁵ Israeli venturing community and the related policy initiatives have very proactively tapped foreign experience and resources.²⁴⁶ The model includes value creation by young technology companies being merged with global market leaders, which has resulted in significant wealth creation, recycling of entrepreneurial capabilities, and a very large number of R&D centers of multinational corporations as a result of the acquisitions.²⁴⁷ In Israel, the Chief Scientist’s Office has a fairly strong coordination of the most of the activities in the financing of young innovative companies.²⁴⁸ Israel policy activity, while uniquely its own, does reflect lessons learned from the USA. Given the very strong links between Israel and the USA in both centers technology and its commercialization, this is not surprising. One outcome of this close association is a similar belief in the ethos of a free market and competition.

243 <http://www.sba.gov/INV/faq.html>

244 IVC forecast: Israeli high-tech capital raising to reach \$1.5 billion in 2006, IVC Center press release, <http://www.ivic-online.com/upload/archive/survey/Q3-06.pdf>

245 The Yozma scheme has been fully described in prior studies (e.g. Avnimelech et al., 2006; Maula et al., 2003a)

246 E.g. when establishing Yozma, a key goal was to attract experienced foreign investors (Avnimelech et al., 2006)

247 Presentation by Yoram Oron, Managing Partner, Vertex Venture Capital, Chairman of Israeli Venture Association in Helsinki, November 8, 2006.

248 For an introduction to the programs, see e.g. <http://www.tamas.gov.il/NR/exeres/2F9931BD-7695-4FAD-9A54-950A1E99B3F8.htm> and <http://www.iva.co.il/content.asp?pageId=42>

Israel's early stage government supported risk capital activities include: Tnufa A pre-seed investment grant that provides up to 85% of costs to a maximum of \$50k per project. Technology Incubators A similar program seeking to 'provide a framework and support for nascent companies to develop their innovative technological ideas and to form new businesses'.²⁴⁹ Heznek Government Seed Fund takes an equity position in start-up companies (€900k) that will fund up to 50% of and 'approved work program' and 60% of 'approved expenses'. Government gives an upside incentive for private investors to buy out the government stake within 5 years at the initial price plus interest.

The schemes are designed to stimulate the supply of high quality start-up businesses. (Israel has in addition a considerable number of schemes covering the promotion of R&D and technology transfer on an international basis, such as the BIRD program which provides funding for projects in which Israeli startup companies commercialize their technology with US companies).²⁵⁰ These cited schemes are designed for nascent business and address the invention-innovation divide. However, they are not designed to accelerate the growth of micro-firms. In its place, Israel has created an international network of collaborations by which Israeli technology is introduced into established firms, e.g. Matimop, ISERD, and Eureka. The Global Enterprise R&D Co-operation Framework similarly links Israeli technology-based start-ups to multi-national enterprises in order to "propel R&D projects into global market (sic)²⁵¹".

A.2 Policy Instruments

The need for government intervention in the finance of young innovative companies is usually established based on the so called financing gap argument²⁵² i.e. low availability of private venture capital investments in early stage companies. Such problem has been found to be prevalent in nearly all countries.²⁵³ The reasons for low availability for private investment include significant asymmetric information

249 (Ministry of Industry Trade and Labor, 2006)

250 <http://www.birdf.com/>

251 (Ministry of Industry Trade and Labor, 2006)

252 "Equity gap" first introduced in the MacMillan (1931) report 1932 report.

253 (Harding et al., 2003; OECD, 2006)

between early stage ventures and potential outside investors, relatively very large transaction costs, and high risk, among other reasons.²⁵⁴

When a financing gap has been identified, the government faces a question whether and how it should intervene. Extant research provides quite clear recommendations for governments: (1) Yes, functioning venture capital market is important for the economy,²⁵⁵ so government should make sure the markets work well. There are no venture capital markets in the world in which government would not have played an important facilitating role;²⁵⁶ (2) When intervening, the first priority is on indirect measures, e.g. making sure the tax and legal environment is conducive for efficient market;²⁵⁷ (3) if investing to improve the supply of capital, the investments should preferably be made indirectly, i.e. using a bidding process to select best possible private managers to make the portfolio company level investment decisions.²⁵⁸

Government Sponsored Venture Capital Funds

One of the common responses to the identified market failures in early stage venture capital finance have been government sponsored venture capital programs. Most often, the goal is to jump start the venture capital market by creating new general partner teams,²⁵⁹ e.g. Yozma, New Zealand,²⁶⁰ Australia and ECFs. Direct investments are more prone to suffer from crowding out.²⁶¹

254 (Murray, 2007; Murray et al., 1998) See also review in Chapter 2.1

255 (Achleitner et al., 2005)

256 (Lerner et al., 2005)

257 (Armour et al., 2006)

258 (Luukkonen et al., 2006; Maula et al., 2003a; Modena, 2002), many examples from Israel, New Zealand, United Kingdom among others.

259 Statistics show that 30% of institutional investors categorically decline from investing in initial funds. Out of the 660 LPs surveyed, 45% said that they definitely invest in first-time funds, while a further 18% said they would consider doing so. 7% said they will only invest with teams that have spun out of an existing firm, and 30% said that they would not invest with a first-time fund at all (Private Equity Intelligence Ltd, 2006). European LPs are more averse towards first-time funds than their colleagues in North America or the rest of the world.

260 (Lerner et al., 2005)

261 (Cumming et al., 2006b; Leleux et al., 2003)

Table 3. Examples of government sponsored venture capital programs

	Yozma	ECFs	Australia IIF	New Zealand VIF	Finnish Industry Investment	Veraventure
Government investment	Max 40%	Max 2:1	Max 2:1	Max 1:2	Pari passu, max 50%	
Incentives	Option for private investors to buy out government share	Upside	Upside (profit split 90:10 private/government)	Upside	None	None
Foreign investors	Key target group	Limited role	Some role	Limited role	Limited role	Limited role
Due diligence		Outsourced	Outsourced	Outsourced	Own	Own
Established	1993	2005	1997	2001	1994	2005
Minimum fund size				NZ\$30M	No limit	No limit
Bidding process	Round	Rounds	Rounds	Rounds	Continuing application	

Yozma²⁶² has become one of the most well-known government initiated VC programs internationally. Its reputation rests on three related outcomes: (1) Yozma was pivotal in creating an indigenous Israeli venture capital industry; (2) this was demonstrably achieved within five years; and (3) the government was able to withdraw from an active involvement in the market place by selling, at a profit, its shares of eight of the ten Yozma funds back to the Israeli and foreign private investors. These ambitious goals were designed into the original specification of the Yozma program by creating attractive incentives for the private investors to act according to the policy goals of Israel.

Yozma and the government's finance were initially directed towards new funds primarily created by experienced non-Israeli investors bringing their finance and skills to Israel. Yozma had as its goals to import knowledge and experience to set up and operate VC funds and to create local management teams as well as to create an international network with foreign VCs and other investors.²⁶³ Yozma provided up to 40% of the capital in each of the new funds but limited itself to not more than \$8m per fund with private partners contributing \$12m. Thus, the overseas investors in the new funds had to find 60% of the funds under management. The incen-

262 (Avnimelech & Teubal, 2003; Avnimelech et al., 2004a, 2004b; Avnimelech et al., 2006; Erlich, 2002; Gilson, 2003; Maula et al., 2003a; Modena, 2002; OECD, 2002; Sadovski, 2001)

263 (Sadovski, 2001)

tive for private investors was the option to buy Yozma out of their funds after five years at the pre-arranged option price of the investment value + LIBOR + 1% in addition to 7% of the future profits. Yozma invested in 10 small new funds and 15 start-ups directly. The target funds had grown from the original \$200m to \$2.9bn under management in 2001 by the subsequent ‘baby funds’.²⁶⁴

Enterprise Capital Funds (ECF).²⁶⁵ The new Enterprise Capital Funds scheme has been designed based on experiences from the U.S. SBIC and other schemes and follows well the established good practice. It has some important characteristics: (1) the instrument has been designed to target a market failure that has been analyzed and documented; (2) the government improves the supply of funding, but acts only as a fund investor to catalyze privately managed funds; (3) the structure using asymmetric profit sharing model creates incentives by rewarding success and enables competitive returns for private investors from early stage investments; and (4) there is an open bidding process to get best teams to run the funds.

The objective of the program is to increase the availability of growth capital to SMEs affected by the identifies ‘equity gap’ by encouraging an increased flow of private capital into the equity gap, by adjusting the risk-reward profile for private investors making such investment; and lowering the barriers to entry for entrepreneurial risk capital managers by reducing the amount of private capital needed to establish a viable venture fund. The model is based on U.S. SBIC model but adapted for UK: (1) government investment as a loan to fund; and (2) no downside protection – instead addresses risk-return issue with enhanced return for investors. The government loan is made at 10-year government bond rate (circa 5%). The leverage will not be more than 2 times the private investment. The scheme is open to regulated managers or business angel syndicates to run funds. Funds will need to invest in the identified Equity Gap (subject to EC clearance up to £2m). Part of the bidding process is to demonstrate that they will not crowd out private provision. Profit share to Government and fund management charges to be determined in bidding process but; quality of team and investment strategy are very important. Profit share is set to ensure that program is cost neutral in the medium term.²⁶⁶ The com-

264 (Sadovski, 2001)

265 (Cooper, 2004; European Commission, 2004a; HM Treasury & Small Business Service, 2003; Small Business Service, 2004a)

266 (Cooper, 2004)

mission approved the scheme in 2005.²⁶⁷ The first bidding round resulted in 45 bids from prospective general partner teams in 2005, of which 4 were selected.²⁶⁸ In November 2006, the Minister for Industry announced the launch of a second round competition for Enterprise Capital Funds (ECFs) expecting to commit up to £50m in this round and further £50m in a later round in 2007.

Innovation Investment Funds (IIF)²⁶⁹ program in Australia was established in 1997 in order to stimulate the financing of small high-tech companies in Australia. The objectives of the IIF fund are stated as follows: (1) to encourage the development of new technology companies which are commercializing research and development; (2) to develop a self-sustaining Australian early stage, technology-based venture capital market; (3) to establish in the medium term a “revolving” or self funding scheme; and (4) to develop fund managers with experience in the early stage venture capital industry.²⁷⁰ The IIFs are administered by licensed private sector fund managers who make all investment decisions, subject to the terms of their license agreements with the Australian Government and other governing documents. Key elements of the IIF program’s operating requirements are: (1) the ratio of Government to privately sourced capital must not exceed 2:1; (2) investments will generally be in the form of equity and must only be in small, new technology companies; (3) at least 60% of each fund’s committed capital must be invested within 5 years; (4) unless specifically approved by the Industry Research and Development (IR&D) Board, an investee company must not receive funds in excess of \$4m or 10% of the fund’s committed capital, whichever is the smaller; (5) distribution arrangements provide for: (a) both the Government and the private investors to receive an amount equivalent to their subscribed capital and interest on that capital; (b) any further amounts to be then shared on a 10:90 basis between the Government and private investors; (c) the private investors’ component to be shared with the fund manager as a performance incentive; (6) the funds established under the IIF program will have a term of ten years, after which they will be closed in a commercially prudent manner.²⁷¹ The model has received positive evaluation

267 In s press release “Commission endorses UK Enterprise Capital Funds for small business” on May 3, 2005, Commissioner Neelie Kroes said: “Small and medium sized businesses have an important role to play in strengthening the European economy and creating jobs, and this scheme will help them to flourish in the UK. This scheme is a good example of how state aid can play a very positive role, notably in boosting competitiveness in areas where the market often fails to provide adequate finance.”

268 (“£40 million Enterprise Capital Funds announced”, Small Business Service Press release on May 22, 2006)

269 www.ausindustry.gov.au, for a recent scholarly analysis, see Cumming (2006).

270 AusIndustry Fact Sheet: Innovation Investment Fund, www.ausindustry.gov.au

271 AusIndustry Fact Sheet: Innovation Investment Fund, www.ausindustry.gov.au and Cumming (2006)

in rigorous academic research.²⁷² Following a review in May 2006, the Government announced a 3rd round of the IIF program with \$200m of capital to support 10 new funds. This new round of IIF funding will appoint up to two new managers each year for 5 years with \$40m in funding available per annum for successful fund managers.²⁷³

New Zealand Venture Investment Fund (NZVIF)²⁷⁴ is a fund-of-funds program with NZ\$100m of capital to be invested in venture capital funds focused on New Zealand. The goals of the program are: (1) to accelerate development of the New Zealand venture-capital industry by increasing the level of early stage (seed, start-up and early expansion) investment activity in the New Zealand market; (2) to develop a larger pool of people in New Zealand's venture capital market with skills and expertise in early stage investment; (3) to facilitate the commercialization of innovation from Crown Research Institutes, Universities and the private sector; and (4) to get more New Zealand businesses on paths to global success by increasing their access to international experts, networks and market knowledge.

The structure includes both constraints and incentives to attract highly competent investors to invest in early stage ventures in New Zealand.²⁷⁵ Initial capital investments are to be made in innovative New Zealand businesses (majority of assets and employees in New Zealand at the time that initial investments are made). Furthermore, initial capital investments must be made in early stage (seed, start-up and early expansion) businesses. However, investors also have an option to buy-out the VIF stake in funds to be exercised to the end of the fifth year in the life of the fund, at a price that returns VIF its capital invested plus a rate of return on that capital equal to the yield on the five year Government bond rate. If VIF has not been bought out before the fifth year of the fund, it will take a pro-rata share of the net proceeds of the funds (including losses, if these have occurred), in the same manner as all other investors, when the fund terminates.

Besides investments, NZVIF has also undertaken several activities to promote and encourage the development of the sector, including:²⁷⁶ (1) Establishment of standard venture capital investment documentation, designed for the New Zealand market. Such documentation was not previously available in the New Zealand

272 (Cumming (2006)

273 (Department of Industry Tourism and Resources, 2006)

274 www.nzvif.com/. For a recent evaluation, see Lerner et al., (2005)

275 <http://www.nzvif.com/vcinvestmentterms.html>

276 (Lerner et al., 2005)

market and was developed without antecedents, based on standard international best practice; (2) Submissions to government on venture capital issues; (3) Sponsorship of NZVCA for specific market development initiatives; (4) A series of institutional investor seminars conducted in New Zealand, and annual one-on-one education and promotion meetings held with targeted venture capital fund managers and Fund of Funds operating in the Australian market; (5) Commissioning of a survey from US based Venture Economics, to identify international venture capital fund managers that may have an interest in New Zealand, and publication of articles in relevant investor journals. The NZVIF's selection process includes comprehensive due diligence to ensure that the fund is "investment grade" completed for it by the international investment advisory firm Wilshire Associates.

Research Commercialization Funds

Several countries have implemented programs to support the commercialization of the results from publicly funded R&D.²⁷⁷ Examples reviewed here include the SBIR program in the United States, Commercialisation Fund of Enterprise Ireland, COMET in Australia, and TNUFA in Israel.

TNUFA in Israel is intended for inventors, entrepreneurs and start-up companies during the initial phase toward the realization of their ideas. TNUFA fund will contribute toward getting patents, the construction of a prototype to verify the viability of the idea, preparation of a business plan and the mobilization of initial capital. The grant for this program is 85% of the approved costs up to a maximum of NIS 210k (Approx. \$47k).

Commercialising Emerging Technologies (COMET)²⁷⁸ program was established to address a gap identified by private fund managers when the IIF program was established – that most early-stage firms were not 'investment-ready' because they suffer from a poor grasp of the realistic market opportunity for their product and/or limited understanding of intellectual property and general business management skills. These high risk factors make it very difficult for venture capital funds to undertake due diligence and feel confident in the prospects for the business. COMET is designed to build business innovation by providing support in the form of knowledge services that are tailored for each grantee depending on their specific needs. It is available for individuals and small companies with ideas at the earliest stage of development, when assistance with devising a marketing plan, building a prototype, developing an intellectual property strategy, and other as-

277 For a review from the Finnish perspective, see Valovirta et al. (2006).

278 The review is extracted from a report of the Department of Industry Tourism and Resources (2006), see also program description and guideline at www.ausindustry.gov.au

pects of business planning can make a big difference in attracting investor confidence and growth capital.

The program provides around \$56k/max 80% of costs or \$64k/max 50% of costs to each firm via the services of COMET business advisers operating across Australia. The business advisers assist applicants to access the appropriate knowledge services for their specific needs and identify possible growth paths and sources of funding. The COMET program is assisting to build availability, capacity and access for small firms to knowledge intensive services. A 2002 review²⁷⁹ found that 27 percent of businesses assisted by COMET had secured equity funding through their experience in the program, with a further 31 per cent involved in negotiations for equity funding. Thirty-seven percent of clients had finalized one or more strategic alliances, with 31 percent involved in negotiations. Joint ventures had been completed by 16 percent of clients. The review concluded that the program was making a "...very important contribution to the entrepreneurial economy."

Commercialisation Fund²⁸⁰ of Enterprise Ireland seeks to encourage and facilitate high quality applied research aimed at the commercial exploitation of knowledge. In doing so, it is recognized that this process is an uncertain activity and that the conversion of scientific principles into the commercial environment requires sustained support. As part of its commitment to facilitating the commercialisation of research, Enterprise Ireland is bringing a range of supports together under a Commercialisation Fund. EI provides support in three phases:

1. Proof of Concept Phase
2. Technology Development Phase
3. Business Development Phase – CORD²⁸¹

Proof of Concept phase focuses on a "proof of concept" model. Individuals or small groups work on short applied projects to develop a product concept through to a stage where a route to commercialization is clear. Either a campus company or licensing may be involved in the planned route to commercialization. Under the scheme Enterprise Ireland supports academic researchers in establishing that a scientific concept from whatever source (1) is sufficiently robust, (2) is seen to address a viable market and (3) is not encumbered by intellectual property consider-

279 (Howard Partners, 2002)

280 http://www.enterprise-ireland.com/ResearchInnovate/Research+Commercialisation/Commercialisation_Fund.htm

281 Under this phase EI also offers support through their Enterprise Platform Programme – EPP http://www.enterprise-ireland.com/ResearchInnovate/Research+Commercialisation/Business_Development_Phase_-_EPP.htm

ations. Grants to an indicative level of €90k may be awarded for a period typically of up to 12 months or exceptionally 18 months, subject to a competitive evaluation process. The proposals are evaluated by panels of typically 6–8 evaluators invited from academia as well as industry.

Technology Development phase of the Commercialisation Fund funds research aimed at major technology development around platform technologies or groups of products built around a new technology. The underlying technologies must be sound and there should be an identifiable market. The fund supports research in areas of technology of medium term interest to industry in Ireland leading to technologies, products or processes that can provide the basis of new businesses in Ireland or can improve the competitiveness of industry in Ireland through licensing agreements. The Technology Development grants are subject to the terms of a grant agreement between the host institution and Enterprise Ireland. They cover 100% of all eligible costs (e.g. personnel, equipment, material and travel) and should typically be for no more than €350k–€400k for projects typically up to three years duration.

Commercialisation of Research and Development (CORD)²⁸² aims to bring a new product idea/business ventures from our third-level educational institutions to market. The grants are designed to enable the commercial viability of your project to be assessed. Funding is available for market research, product trials/market assessment, establishing links with potential joint venture partners, cost analysis, and financial projections. CORD grants may be approved up to 50% of eligible expenditure with a ceiling of €38k per grant.

Small Business Innovation Research Program (SBIR)²⁸³ is a competitive program to encourage small business to explore their technological potential and to profit from its commercialization. SBIR was enacted in 1982 as part of the Small Business Innovation Development Act. SBIR is based on reserving 2.5% of federal R&D funds for small business. Each year, eleven federal departments and agencies are required by SBIR to reserve a portion of their R&D funds for award to small business. These agencies designate R&D topics and accept proposals. Following submission of proposals, agencies make SBIR awards based on small business qualification, degree of innovation, technical merit, and future market potential. Small businesses that receive awards then begin a three-phase program.

282 http://www.enterprise-ireland.com/ResearchInnovate/Research+Commercialisation/Campus_Enterprise.htm

283 (Audretsch, 2003; Audretsch, Link, & Scott, 2002; Audretsch, Weigand, & Weigand, 2002; Branscomb et al., 2002). For a details on SBIR, see: <http://www.sba.gov/SBIR/indexsbir-sttr.html>

Phase I is the startup phase. Awards of up to \$100k for approximately 6 months support exploration of the technical merit or feasibility of an idea or technology.

Phase II awards of up to \$750k, for as many as 2 years, expand Phase I results. During this time, the R&D work is performed and the developer evaluates commercialization potential. Only Phase I award winners are considered for Phase II.

Phase III is the period during which Phase II innovation moves from the laboratory into the marketplace. No SBIR funds support this phase. The small business must find funding in the private sector or other non-SBIR federal agency funding.

The US Small Business Administration plays an important role as the coordinating agency for the SBIR program. It directs the 11 agencies' implementation of SBIR, reviews their progress, and reports annually to Congress on its operation. SBA is also the information link to SBIR. SBA collects solicitation information from all participating agencies and publishes it quarterly in a Pre-Solicitation Announcement (PSA). The PSA is a single source for the topics and anticipated release and closing dates for each agency's solicitations.

Business Angel Co-investment Funds

One of the financing instruments that have been introduced in several markets are so called "co-invest funds" with the target to support business angel investments by matching the investments made by business angels to improve the economies of scale in the investment activity. The basic idea is that the funds come from public sources and they supplement private investments so that investments are made alongside private investors. The best known and often bench-marked model is the instrument introduced in Scotland in 2003. Since then, somewhat similar instruments have also been introduced e.g. in New Zealand.²⁸⁴ Finnish Industry Investment compares their seed program to these. However, despite similarities, there are also differences between the programs (e.g. management fee issue). The implementations of co-investment funds in different countries is briefly compared in Table 4.

284 (New Zealand Venture Investment Fund Ltd., 2005)

Table 4. Co-investment funds

	Scottish Co-investment Fund (SCF)	New Zealand Seed Co-Investment Fund	Heznek Program – The Government seed fund	Finnish Industry Investment Seed program
Funding source	£45m equity fund partially funded by ERDF	NZ\$40m (100% government)	Israeli government	€100m (100% government)
Fund manager	Scottish Enterprise	New Zealand Venture Investment Fund Ltd (NZVIF)	Office of the Chief Scientist of the Ministry	Finnish Industry Investment
Applicable investors	Pre-qualified	Pre-qualified	Anyone with sufficient resources	Anyone
Founded	2003	2005	2004	2004
Volume	£45M	\$40m for 5-6 years		
Investment policy	Investments up to £500k in deals of up to £2M. Passive SMEs based principally in Scotland assets of less than £16M equal terms	Investments up to NZ\$250k + potential follow-on up to NZ\$250k Equal terms, max 50% In seed and start-up stage companies based in New Zealand	Investments up to NIS 5m per company per two year period that will finance up to 50% of the Approved Work Program (R&D).	Investments on equal terms with private investors. Private investors source the deals. FII takes a passive d, approved business sector, up to 250 employees and net role.
Compensation/incentive for private investors	Yes, governments share of commitment fee.		Yes (option to buy out government stake within 5 years with initial price + interest)	No

Scottish Co-investment Fund (SCF)²⁸⁵ is a £45m equity fund which can invest between £50k and £500k in company finance deals of up to £2m. Target companies have to be SMEs based principally in Scotland, in an approved business sector with up to 250 employees and net assets of less than £16m. SCF is partially funded by the European Regional Development Fund. SCF co-invests with pre-selected private co-investors which are a range of corporate ventures; institutional investors; professional fund managers and investors; business angel syndicates; and private individual investors (currently 23 nominated partners). Partner's role is to find the investment opportunity, negotiate the investment deal and invest its own money along with SCF money on equal terms. Scottish Enterprise does not find and negotiate investment deals on its own or take any part in deciding whether the company is a good opportunity, or has been valued at the right level. As long as the

285 http://www.scottish-enterprise.com/sedotcom_home/services-to-business/businessfinance/equity/finance-co-profile.htm

business passes basic criteria (largely size, location and sector) the partner is the one who will make the investments. Private sector investors usually charge a commitment fee of 1%-2% on sums they invest from the target company, when sums are drawn down. SCF usually passes its share of this commitment fee to its partner. The leverage effect of SCF has been assessed to be substantial with the average business angel deal size in 2004 increasing from £179k to £475k when business angels co-invested with the fund.²⁸⁶

New Zealand Seed Co-Investment Fund²⁸⁷ is a new investment program aimed at early stage businesses with strong potential for high growth. The fund was established in late 2005 and made its first investment in 2006. It is a \$40m fund which co-invests with selected co-investment partners (currently 4 accepted partners but seeking more). In October 2006 it had invested \$16m. Investments through the fund are limited to a maximum investment of \$250k in any one company or group of companies; with the possibility of another \$250k in follow-on capital at the discretion of NZVIF. The key objectives of the Seed Co-Investment Fund are to enhance the development of angel investor networks, stimulate investment into innovative start-up companies, and to increase capacity in the market for matching experienced angel investors with new, innovative start-up companies.

Heznek Government Seed Fund²⁸⁸ Israeli Government takes an equity position in start-up companies (up to NIS 5m, i.e. €900k) that will fund up to 50% of and ‘approved work program’ and 60% of ‘approved expenses’. Like its earlier Yozma parent, the government gives an upside incentive for private investors to buy out the government stake within 5 years at the initial price plus interest.

Government Support for Business Angel Networks

Systemic market inefficiencies and persistent funding gaps (primary seed gap and secondary post-seed gap) have led the angel market to adopt various organizational structures and market mechanisms to increase the efficiency of quality deal flow and increase the availability of capital.²⁸⁹ Angels tend to syndicate often, and have attempted to find effective ways to pool their capital.²⁹⁰ Adapting to changing market conditions, multifaceted angel organizations have evolved. These organi-

286 (Don & Harrison, 2006)

287 (New Zealand Venture Investment Fund Ltd., 2005)

288 <http://www.moit.gov.il/NR/exeres/7F83758F-3C0E-42A6-80CA-63A4616E8097.htm>

289 (Sohl, 2007)

290 For a review of good practices in angel syndication, see Carriere (2006)

zations help entrepreneurs find potential investors and business angels find and screen deals, syndicate into small groups to make an investment, and interact within the larger angel market. It has been found that Internet-enabled solutions are creating new opportunities for entrepreneurs and venture investors alike and facilitate the emergence of new breeds of introduction services connecting these parties more efficiently.²⁹¹ There have been seen two simultaneous polar developments, one toward the mass distribution of information regarding start-up opportunities (entrepreneur-centric networks) and the other, in reaction to the first, toward extreme screening of the information for a select audience (investor-centric networks).²⁹² In Europe, around half of the angel networks receive at least some public support from local, regional or national authorities.²⁹³ Although public funding is often needed particularly in the beginning, there are also disadvantages in too high reliance on public funding.²⁹⁴

Tax Incentives for Business Angels

The realization that formal venture capital investors are unlikely to fully resolve the funding challenges of growth-oriented young innovative companies, many countries in Europe²⁹⁵ and many states in the United States²⁹⁶ have started to focus on business angels. For instance, in 2005 when US venture capitalists invested in 192 seed and start-stage companies,²⁹⁷ US business angels invested in nearly 50 000 companies, the vast majority being start-up and early stage businesses.²⁹⁸ In the US, 227 000 active business angels were actively looking for investment op-

291 (Lange, Leleux, & Surlemont, 2003)

292 (Lange et al., 2003)

293 (European Commission, 2003)

294 The report by the European Commission (2003) notes: "The UK experience shows that the publicly financed and the commercially-oriented angel networks tend to serve different segments of the market, as the transaction fees of the commercial networks tend to be higher, which squeezes out small investors. On the other hand, a too strong public support component can have an impact on the image of the networks. If they became identified with public service institutions, this might reduce their attractiveness from the individual business angel's point of view, as they might identify the networks with bureaucracy and rigidity. However, in particular in the awareness raising stage a public support element is mostly necessary, especially because this is a general requirement for the angel market to take off."

295 (EBAN, 2006)

296 (CDVCA, 2004)

297 PwC/NVCA Moneytree 2006

298 (Sohl, 2006)

portunities and developing their portfolio companies in 2005.²⁹⁹ Therefore, policy makers concerned with encouraging investments in new enterprises should redirect their energies from promoting venture capital to removing the barriers to informal investing.³⁰⁰ The encouragement and incentivization of business angel activity should be a priority policy goal. In addition to reducing capital gains taxation of such investments, also other types of tax incentives have been considered to be an important instrument for catalyzing business angel activity alongside other measures such as support for business angel networks and various demand side and investment readiness activities.³⁰¹ Existing or proposed tax incentives in different countries are briefly compared in Table 3.

Table 5. Tax incentives for business angels

	Enterprise Investment Scheme (EIS), UK	Business Expansion Scheme (BES), Ireland	Réduction d'impôt pour souscription au capital de sociétés non cotées, France	Access to Capital for Entrepreneurs Act of 2006 (ACE), USA
Tax credit	20%	Income tax rate	25%	25%
Capital gains tax relief	100% after 3 year holding period	Not a part of the model (currently 20% rate)	Not a part of the model (currently 27% rate)	Not a part of the model (varies between 15–28% depending on circumstances)
Other incentives	Capital losses on shares treated as income losses Deferral of chargeable gain on any asset IHT relief on shares			
Required holding period	3 years	5 years	5 years	3 years
Limit	Max deductible investment £400k per year	Max deductible investment €31.75k per year	Max deductible investment €20k per person or €20k per couple per year	Max deductible investments \$500k per person per year (max \$250k per company)

299 (Sohl, 2006)

300 (Bygrave, Hay, Ng, & Reynolds, 2003)

301 (Mason & Harrison, 2002; Mason & Harrison, 2004) For a recent review of different types of tax incentives to catalyze business angel investments, see Maula (2007).

Enterprise Investment Scheme (EIS)³⁰² in UK is considered by many as the most advanced tax incentive scheme for business angels. It was introduced in 1994 to replace older Business Expansion Scheme (1983–1994) as a more focused scheme and has been further developed since then. It has been estimated to be very important catalyst of informal venture capital in the United Kingdom.³⁰³ The main features of the scheme are 20% front end tax credit and exemption from capital gains tax after 3 year holding period.³⁰⁴ Other features include a loss relief, deferral of chargeable gain and IHT relief. The scheme has been targeted to catalyze informal venture capital investments in young growing companies, so there are many constraints on the qualifying investments including the target company being unquoted (AIM is acceptable, however) and gross assets being £7m or lower before investment (£8m or lower after). The main criticisms in the implementation of the schemes have been the limitation to ordinary shares (business angels would prefer other instruments) and the complexity of the rules of the scheme.

Access to Capital for Entrepreneurs Act of 2006 (ACE)³⁰⁵ was introduced in the House of Commons in April 2006 and in the Senate in September 2006. Under the proposed scheme, angel investors would be eligible for a 25 percent tax credit to offset up to \$500k of investments per year (max \$500k per company). The scheme is modeled based on the experiences from 21 states in the United States.³⁰⁶

Business Expansion Scheme(BES).³⁰⁷ In Ireland there has also existed a tax incentive for business angels since 1984. However, it has not been considered fully successful given its somewhat limited use. In 2004, 320 companies raised a total of €50.1m through the BES.³⁰⁸ One of the identified problems in the current instruments is the very low limit of max €31.75k investment qualified for deduction, which is not in line with the size of investments typically needed in young innovative companies. Other perceived problems have existed in the targeting of the scheme. Furthermore, BES specifically prohibits direct input of investors into the management or direction of the investee company, which prevents potentially

302 <http://www.hmrc.gov.uk/eis/eis-index.htm>

303 (Boyns et al., 2003a)

304 20% tax credit and CGT exemption evaluated to be clearly the two most important elements in the scheme according to a survey of users of the scheme (Boyns et al., 2003b).

305 (109th U.S. Congress (2005-2006), 2006; Preston, 2006)

306 (CDVCA, 2004; Preston, 2006)

307 http://www.revenue.ie/leaflets/it_55.pdf

308 (Small Business Forum, 2006)

valuable operational advisory activity on the part of the investors.³⁰⁹ In 2006, it has been recommended to raise the limit to €250k.³¹⁰

Réduction d'impôt pour souscription au capital de sociétés non cotées.³¹¹

France has also had a tax credit scheme to catalyze business angel investment with a 25% tax credit. However, the maximum qualifying investment €20k per person or €40k per couple per year have been low for the purposes of business angel investments. France has recently developed other advanced schemes to further catalyze business angel activity. One considered as important by experts is a new company form designed to subscribe for shares in startup companies (la Société Unipersonnelle d'Investissement à Risque, SUIR). SUIR company functions as a partnership, is owned by one shareholder (a natural person) and is exempted from corporate taxes and from the total annual taxation for a period of ten years both from the income and the realized capital gains for the ten years following the establishment of the SUIR company. Some of the constraints in the scheme reduced its attractiveness after the introduction in 2004, but in 2006 the scheme has been made more applicable to business angel context.

309 (Enterprise Ireland, 2005)

310 (Small Business Forum, 2006)

311 http://www.apce.com/index.php?n=1&rubrique_id=500000000&type_page=IH&contenu_id=654&tpl_id=64

<p>Tekijät (toimielimestä: nimi, puheenjohtaja, sihteeri)</p> <p>Markku Maula Gordon Murray Mikko Jääskeläinen</p>	<p>Julkaisu-aika Tammikuu 2007</p> <p>Toimeksiantaja(t) Kauppa- ja teollisuusministeriö</p> <p>Toimielimen asettamispäivä</p>
<p>Julkaisun nimi Alkavien innovaatioyritysten julkinen rahoitus Suomessa</p>	
<p>Tiivistelmä</p> <p>Alkavien innovaatioyritysten käynnistys- ja varhaisen kasvuvaiheen rahoitus on kehittynyt merkittävästi kuluneen vuosikymmenen aikana. Tästä positiivisesta trendistä huolimatta rahoituksessa on edelleen haasteita. Suomen kansainvälisesti vahva maine innovaatioiden tuottajana ei ole toistaiseksi johtanut vastaavaan menestykseen innovaatioiden kaupallistamisessa. Internet-kuplan puhkeaminen vuosituhannen vaihteen jälkeen aiheutti merkittäviä haasteita Suomen vielä epäkypsälle pääomasijoituslalle. Lupaavat alkavan vaiheen yritykset kärsivät näistä ongelmista erityisen suuresti. Tekes, Suomen Teollisuussijoitus, Finnvera ja Sitra kaikki kohdistivat suoria toimenpiteitä ja rahoitusinstrumentteja havaittujen markkinapuutteiden korjaamiseen auttaen merkittävästi uusia alkavia innovaatioyrityksiä syntymään ja olemassa olevia yrityksiä selviytymään vaikeassa rahoitusmarkkinaympäristössä.</p> <p>Seuraavien viiden-seitsemän vuoden aikana Suomen tulee edelleen kehittää alkavien innovaatioyritysten julkista rahoitusta sen tehokkuuden ja tarkoituksenmukaisuuden varmistamiseksi taloudellisten syklien eri vaiheissa. Suomen tulisi asettaa <i>kunnianhimoinen tavoite</i> Suomen kehittämiseksi yhdeksi suhteellisesti aktiivisimmista markkinoista alkaviin innovaatioyrityksiin sijoittamisessa ja taloudellisen ja yhteiskunnallisen hyödyn luomiseksi ja realisoidumiseksi niistä. Markkinoiden tulisi olla yksityisvetoiset sekä kilpaillut ja houkutella osaavimpia yksilöitä ja organisaatioita sijoittamaan ja luomaan arvoa alkavista innovaatioyrityksistä. Valtion tulisi myös antaa <i>selkeä signaali sitoutumisesta</i> yksilöiden yrittäjyyden ja riskinoton kannustamiseen ja niiden arvostuksen nostamiseen. Verokannustimia voisi käyttää paitsi kasvuyritystoiminnan ja siihen liittyvän riskisijoittamisen kannustamiseen myös vahvistamaan tätä signaalia. Suomen tulisi myös ottaa <i>avoin ja globaali lähestymistapa</i> ja hyödyntää kaikkia taloudellisia ja inhimillisiä resursseja alkavien innovaatioyritysten kehittämiseksi ja taloudellisen ja yhteiskunnallisen hyödyn luomiseksi ja realisoidumiseksi. Suomen tulisi <i>määrätietoisesti</i> toteuttaa tätä markkina-keskeistä strategiaa ja poistaa tarpeeton päällekkäisyys ja sirpaleisuus, ehkäistä julkisen sektorin tarpeetonta kasvua sekä parantaa julkisen sektorin organisaatioiden yhteistyötä ja asiakassuuntautuneisuutta julkisen rahoituksen tarjonnassa. Valtiosektorin päävastuu on luoda toimivat puitteet kilpailluille ja tehokkaille markkinoille. Toimenpiteisiin, joilla julkinen sektori korvaa ja paikkaa yksityisten kaupallisten sijoittajien toimintaa tulee suhtautua suurella varovaisuudella ja niitä tulisi käyttää korkeintaan väliaikaisesti.</p> <p>KTM:n yhdyshenkilö: Elinkeino-osasto/Pertti Valtonen, puh. (09) 1606 3614</p>	
<p>Asiasanat riskipääoma, alkava innovaatioyritys, julkinen rahoitus</p>	
<p>ISSN 1459-9376</p>	<p>ISBN 978-952-489-105-9</p>
<p>Kokonaissivumäärä 128</p>	<p>Kieli Englanti</p> <p>Hinta 27 €</p>
<p>Julkaisija Kauppa- ja teollisuusministeriö</p>	<p>Kustantaja Edita Publishing Oy</p>

Författare Markku Maula Gordon Murray Mikko Jääskeläinen		Publiceringstid Januari 2007
		Uppdragsgivare Handels- och industriministeriet
		Organets tillsättningsdatum
Titel Offentlig finansiering av innovationsföretag som inleder verksamheten i Finland		
Referat <p>Under det gångna decenniet har finansieringen av innovationsföretag som befinner sig i inlednings- och det tidiga tillväxtskedet utvecklats avsevärt. Trots denna positiva trend bjuder finansieringen alltjämt på utmaningar. Finlands internationellt starka anseende som producent av innovationer har tillsvidare inte inneburit en motsvarande framgång i kommersialiseringen av innovationer. När internertubblan sprack efter millennieskiftet medförde det betydande utmaningar för Finlands tillsvidare utvecklade kapitalplaceringsbransch. Lovande företag i inledningsfasen led alldeles särskilt av dessa problem. Tekes, Finlands Industrifinansiering, Finnvera och Sitra riktade direkta åtgärder och finansieringsinstrument på att avhjälpa marknadsbrister och bidrog väsentligt till uppkomsten av nya innovationsföretag och till att existerande företag klarade sig i en svår finansieringsmarknadsmiljö.</p> <p>För att trygga finansieringen effektivitet och ändamålsenlighet under olika faser av ekonomiska cykler bör Finland under de följande fem-sju åren fortsätta att utveckla den offentliga finansieringen av innovationsföretag som inleder verksamheten. Finland borde ställa ett <i>ambitiöst mål</i> för att utveckla Finland till en av de relativt sett aktivaste marknaderna i fråga om att placera i innovationsföretag som inleder verksamheten och för att skapa ekonomisk och samhällelig nytta samt realisera nyttan. Marknaden borde vara privatdriven och konkurrensutsatt samt locka de mest kunniga individerna och organisationerna att placera och skapa mervärde av innovationsföretag som inleder verksamheten. Staten borde också ge en <i>klar signal om att förbinda sig</i> till att sporra individer till företagande och risktagning och att höja uppskattningen av dem. Skattesporrar borde användas förutom på tillväxtföretagande och riskfinansiering i anslutning till den också på att stärka denna signal. Finland borde dessutom på ett <i>öppet och globalt sätt angripa</i> och utnyttja alla ekonomiska och mänskliga resurser för att kunna utveckla nya innovationsföretag för att skapa och realisera ekonomisk och samhällelig nytta. Finland borde <i>målmedvetet</i> förverkliga denna marknadsorienterade strategi och avlägsna onödiga överlappningar och fragmentariska drag, förhindra att den offentliga sektorn växer alltför mycket samt förbättra samarbetet mellan den offentliga sektorns organisationer och deras kundorientering när det gäller att erbjuda offentlig finansiering. Statssektorns huvudansvar är att skapa en fungerande ram för konkurrensutsatta och effektiva marknader. De åtgärder som den offentliga sektorn vidtar för att ersätta och lappas till enskilda kommersiella investerarens verksamhet bör bemötas med stor försiktighet och de borde tillgripas endast temporärt.</p> <p>Kontaktperson på HIM: Näringsavdelningen/Pertti Valtonen, tfn (09) 1606 3614</p>		
Nyckelord riskkapital, innovationsföretag som inleder verksamheten, offentlig finansiering		
ISSN 1459-9376		ISBN 978-952-489-105-9
Sidoantal 125	Språk Engelska	Pris 27 €
Utgivare Handels- och industriministeriet		Förläggare Edita Publishing Ab

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Public Financing of Young Innovative Companies in Finland

The access of young innovative companies (YICs) in Finland to professionally delivered sources of start up and early growth finance has improved significantly over the last decade. Despite this long-term positive trend, there remain a number of major challenges for public policy. Over the next five to seven years, Finland needs to further develop the access of high potential and high growth young firms to appropriate sources of support. The continuing effectiveness of the Finnish innovation financing system across different stages of the economic cycle will require both public and private initiative. A number of policy recommendations are made in this report.

ISSN 1459-9376
ISBN 978-952-489-105-9
ISSN 1796-0010 (web PDF version)
ISBN 978-952-489-106-6 (web PDF version)

Edita Publishing Ltd
P.O. Box 800, FI-00043 Edita, Finland
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