



The State and **Risk Capital**

Interim Report 1: Procedural Description and Knowledge Survey

For the first time money from ERDF in Sweden is being used in a wider venture capital context. The purpose of this is to enhance the regional range of equity capital (risk capital) to SMEs. Growth Analysis has been committed by the government to evaluate the initiative as a basis for learning ahead of any future initiatives which are similar in nature. The present report is the first out of four in the series.

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Foreword

In the “Letters of Regulation” from the Government for 2009 and 2010, the Swedish Agency for Growth Policy Analysis (“Growth Analysis”)¹ was assigned the task of evaluating efforts to increase the regional range of risk capital (equity capital) in the 2009–2014 period, within the framework of the eight regional structural fund programmes.

Reporting on the assignment is to take the form of three interim reports and one final report. The present report, the first of these reports, presents an overview of international research and a procedural description. The research overview refers to international empirical research into the subsidising/participation of public sectors in similar investments/contributions in the proprietor's capital/venture capital market, from various perspectives. The procedural description provides a general outline of the approach Growth Analysis intends to employ, to carry out the assignment in its entirety.

The current investment of risk capital involves both opportunities and challenges. A projected total of SEK 2.5 billion (c. 257 million euro) is to be invested in companies with growth ambitions throughout Sweden. This will have effects on growth and employment. How large the effects will be and whether the outcomes will offset the costs remain for the final analysis to show. Expectations placed on venture capital must be realistic. While it is an immensely powerful financing instrument with documented ability to create growth, there is a place for nuanced expectations. Venture capital is a form of financing suitable for a limited number of companies with extremely high growth potential. Simply increasing venture capital cannot be expected to reverse the economic trends of regions with weak commercial activity.

Behind the investment lies the basic assumption of a straightforward problem of venture capital supply. The report talks instead about a sliding scale – from a “thick” to a “thin” capital supply market. Such a discussion includes the number of players on both the supply and the demand sides, the extent of their contacts and proper support functions, as well as liquidity and a reliable exit market. It then becomes important to look at the investment in its context, considering that the success of a policy investment can vary depending on regional circumstances.

The private player's return targets encounter in the investment a number of political goals and restrictions. One of the major challenges, then, is the actual balancing of political and commercial aims. Growth Analysis believes further effort is warranted, to produce a clearer and more distinct goal structure that would help the funds, clarify the expectations of them and reduce the need for complicated trade-offs.

The combination of “on-going evaluation” by Ramböll (in its capacity as a procured evaluator) and Growth Analysis evaluation provides a good opportunity for further specification and learning. Promising cooperative arrangements have been launched, between the parties involved in the evaluation and between the funds themselves. The dialogue and interaction is characterised by openness, a desire to learn and a shared determination to ensure that the investment in question is as effective as possible.

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¹ In Swedish: ”Myndigheten för tillväxtpolitiska utvärderingar och analyser” (”Tillväxtanalys”).

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Dan Hjalmarsson
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Summary

For the first time in Sweden, *monies from structural funds are being used for in a wider venture capital context*. The purpose of this measure is to increase the regional supply of equity capital (risk capital); it involves an estimated total of SEK 2.5 billion (c. 257 million euro) and will be implemented during the 2009–2014 period.² Half of the amount is to come from private risk capital players, while the other half will be distributed equally between funds from the European Regional Development Fund (ERDF) and regional public cofinancing arrangements. Behind the twelve funds lie, in various constellations, Almi Invest, Innovationsbron, Norrlandsfonden and the Sixth Swedish National Pension Fund (“Sixth AP Fund”). The target group comprises micro, small and medium enterprises (SMEs) and the investments will primarily target early-stage needs. The measure should be supplementary to market-based provisions and be revolving. The former requirement means it must not crowd out existing private investments, while the latter means that the capital base must not decline in the long term, which will ensure that ongoing investment is possible. The investments always take place in cooperation with a private player investing the same amount³ and on the same terms. Therefore, shared risk and doubling of capital are what the public sector offers the private risk capital market.

Evaluation

The invested amount must also be evaluated. Apart from the evaluation carried out by Growth Analysis, which is described in the present report, ongoing evaluation is also carried out by the Swedish Agency for Economic and Regional Growth (Tillväxtverket)⁴ via Ramböll (a consulting firm). To clarify role allocation and maximise the supplementary effect of this arrangement, an extensive collaboration was therefore launched between Growth Analysis, Ramböll and Tillväxtverket early on. Planning, meetings and the exchange of factual knowledge have taken place frequently and in a positive spirit.

Growth Analysis’ *assignment* is to conduct an evaluation that is intended to serve as a foundation for learning and for the design of possible future efforts of a similar nature. A method for such an evaluation must also be developed. Reporting on the assignment is to take the form of three interim reports (years 2010, 2011 and 2013) and one final report in 2015.

Growth Analysis’ evaluation assignment can be seen as consisting of three components. The first is a *knowledge retrieval* component, based on international research and experimental findings, and on experience from the Swedish ongoing process. The second is an *analytical* component that involves an analysis of the first part. The third and final part concerns providing *feedback* to the government, Tillväxtverket, Ramböll and the funds.

In accordance with the Letter of Regulation⁵, Growth Analysis will report on assignment progress via several interim reports. The present report, the first of these reports, contains

² Exchange rate Swedish kronor (SEK) → euro as at March 2010 (throughout the report).

³ The Fund may invest less than half the amount of the private player, but never more than 50%.

⁴ Due to the somewhat cumbersome English denomination, the Swedish name “Tillväxtverket” will normally be used in the report.

⁵ Government directive putting an appropriation at the disposal of the spending authority and specifying the allocation of the appropriated funds.

an overview of international research (about which see further information below) and a procedural description. *Interim Report No. 2* (2011) will focus mainly on in-depth case studies of some international investment undertakings that are considered particularly interesting from a Swedish perspective. Comparisons between the Swedish process and the international experience will be presented together with reflections on the project period to date. Relevant parts of the agency's analysis of the overall capital supply situation for SMEs (RB Assignment 2010/3) will be included. In *Interim Report No. 3* (2013), the agency will continue its analysis of the experience to date of the ongoing project. In this stage, indications of the structure of the portfolio companies will also be available. The *Final Report* (2015) of Growth Analysis will present an impact evaluation designed to seek answers to the question of which effects the capital supply investment has had, compared with the scenario that would have resulted had the financing not occurred (the “counterfactual situation”). The final report will also summarise the agency's experience of the capital supply undertaking as a whole. International experience will be compared with Swedish experience. The final report will conclude with policy recommendations for possible future undertakings of a similar type. It should be pointed out that this report is expected to come at a much later point, making it difficult to provide detailed descriptions at this early juncture. In its *Interim Reports Nos. 2 and 3* and the *Final Report*, the analyses by Growth Analysis will be based on the agency's own observations and experience as well as on its ongoing evaluations. All the reports will include policy recommendations.

The agency's evaluation assignment generates questions that imply that two types of *evaluation approaches* are required – an implementation type of evaluation and an ex post evaluation. The former category includes international experience of research and evaluation that is to be retrieved, compiled and set in relation to the Swedish capital supply measures. When appropriate, such experience will also be reported back to the fund, to Tillväxtverket and to Ramböll. This evaluation category also includes the analysis based on process experience. The ex post evaluation category includes the impact evaluation to be implemented in 2015 after the measure is concluded, to examine possible causal connections between the capital supply undertakings and the performance of the portfolio companies.

Early policy reflections

The undertaking entails both opportunities and challenges. A projected total of SEK 2.5 billion (c. 257 million euro) is to be invested in companies with growth ambitions throughout Sweden. This will have effects on growth and employment. How large the effects will be and whether the outcome will offset the costs remains for the final analysis to determine. *Expectations placed on venture capital have to be realistic*. While it is an immensely powerful financing instrument with documented ability to create growth, some moderating of expectations is in order. Venture capital is a form of financing suitable for a limited number of companies with extremely high growth potential. A small number of successful investments can yield exceptional returns upon exit – however, most investments at early stages fail or generate extremely modest returns. Venture capital is not the solution for the majority of companies with financing needs. Venture capital alone cannot reverse an economic trend in regions with weak business activity.

The basic premises of the undertaking/investment, such as *finance gap*, *market failure* and *insufficient supply*, are discussed and examined in the report. A finance gap can be considered – regardless of whether market failure or market rationality is an issue – as a

problem for public finances to the extent that start-ups with growth potential are placed at a disadvantage.

Rather than purely a problem of supply, the report discusses *the capital supply market's "viscosity"* (a sliding scale from "thin" to "thick"). A "thin" market has relatively few players, implying it is difficult (in terms of time and cost) for the players to find each other and conclude agreements. In a "thick" market, the opposite applies: here, many players interact frequently with each other. Investors have sufficient size and management competence to carry out the necessary investments and otherwise support the portfolio companies as well. In such a market, there are also enough high-quality advisors and a properly functioning, liquid, exit market. The more instances of a "thin" market a country or region has, the clearer it is that efficient policy measures must contain more than just an increased supply of venture capital.

One conclusion of this is that it is important to consider the action in its context. A policy action can play out *with varying degrees of success depending on regional circumstances*. One policy alternative to a uniform action is the adaptation of available tools to regional circumstances. Actions on the demand side and capital supply instruments other than venture capital could then also be discussed.

In the action, the private player's return targets encounter a number of political goals and restrictions. One major challenge, then, is actually to find a *balance between political and commercial aims*.

Clear game rules are always meaningful. Growth Analysis finds that a *clearer and more distinct goal structure* would definitely have helped the funds, clarified the expectations placed on them and reduced the need for complicated trade-offs. It is therefore crucial that from now on the goal structure be discussed and clarified as much as possible. Judging from conversations at meetings held to date between the funds, Growth Analysis, Tillväxtverket and Ramböll, there is awareness of this, and such discussions have begun, which Growth Analysis considers promising and productive.

Finally, *the learning opportunities* seem to be good. The combination of the ongoing evaluation (via Ramböll) and Growth Analysis own evaluation could, assuming continuing clear role definition, yield many interesting lessons. Good cooperation has commenced between the agencies and with the funds. The dialogue and interaction is characterised by openness, a desire to learn and a shared determination to ensure that the investment in question is as effective as possible.

Research survey

The main part of the report consists of the research survey presented in chapter 3. The review of the current situation for international empirical research examines fourteen government venture capital programmes in eight countries, which are evaluated by thirteen evaluators. This review can be summarised in a number of general observations:

- The hypothesis of a market failure has limited support from research; it is more a matter of players behaving rationally in small or undeveloped markets.
- Public actions shall complement the private sector and not compete with it or crowding it out. This is clearly easier said than done. Government VC programmes are often caught in the middle between the requirement of additionality, on the one hand, and the requirement to act on terms equivalent to those of the private market on the other, which entails a risk of the programme competing with the private market.

- The context in which a VC programme operates is often a critical factor for clarifying why a certain programme succeeds or fails.
- Many public VC programmes include regional policy ambitions. The hope is that venture capital will create growth in a region that lacks growth, an expectation that often implies problems. *Venture capital is drawn to growth regions, but does not create them.*
- Incentive structures that stimulate co-investments from private players are important for a VC programme's chances of success.
- Finally, a number of possible subjects for further study are discussed: for example, a systematic quantitative approach, the effects of sector-oriented (e.g. cleantech) versus general actions, and in-depth country studies.

1 Introduction

For the first time in Sweden, monies from structural funds are being used for in a wider venture capital context. The measure involves an estimated total of SEK 2.5 billion (c. 257 million euro) and will be implemented during the 2009–2014 period.⁶ The target group comprises micro, small and medium enterprises (SMEs) and the investments will primarily target early-stage needs. The measure should be complementary to the market (i.e., not crowd out existing private investments) and revolving (i.e., over the long term, the capital base should not shrink, which will permit continued investments). The investments always take place in cooperation with a private player investing – with at least – the same amount and on otherwise equivalent terms. Therefore, shared risk and doubling of capital are what the public sector offers the private risk capital market.

1.1 The assignment

The assignment given to Growth Analysis is formulated by the Government in the 2009 and 2010 “Letters of Instruction” for the agency.⁷ The present evaluation is intended to serve as a foundation for learning and for the design of possible future actions of a similar nature. A method for evaluating the actions will be developed.

The assignment consists of two parts:

- Growth Analysis is to evaluate actions to increase the regional supply of equity capital (risk capital) to new and growing companies within the framework of the European Regional Development Fund (ERDF), and be a part of the learning process. The evaluation is to be designed in relation to established targets. The assignment should complement the evaluation efforts to take place on the project and programme levels. The agency will develop a method that could be used to evaluate the actions. The assignment should be carried out in agreement with the European Commission's guidelines regarding ongoing evaluation, and international expertise shall be obtained during the work.
- Growth Analysis is to produce a compilation of international empirical research focusing on the impact of similar actions. General conclusions that can be drawn from these studies should be highlighted. International actions considered especially interesting from a Swedish policy perspective shall, if the agency considers it relevant, be investigated in more depth in the form of one or more in-depth case studies.

Reporting on the assignment is to take the form of three interim reports (years 2010, 2011 and 2013) and one final report in year 2015.

1.2 Report outline

The report consists of four chapters. *Chapter 1* contains a brief description of background and of the design of the policy instrument. *Chapter 2* contains a methodological discussion as basic input for the agency's implementation planning. *Chapter 3* contains a survey of international empirical research into the subsidising/participation of the public sector in similar actions in the VC market. The research survey was written by Anders Isaksson,

⁶ Exchange rate Swedish kronor (SEK) → euro as at March 2010 (throughout the report).

⁷ Government directive putting an appropriation at the disposal of the spending authority and specifying the allocation of the appropriated funds.

Ph.D., Umeå University. In the *fourth and final chapter*, Growth Analysis presents a policy discussion based on the design of the intervention and on research experience.

1.3 Background of the measure

The assignment of the European Regional Development Fund (ERDF) is to strengthen economic and social cohesion within the EU by evening out regional disparities. This includes providing direct investment support to companies, infrastructure investments in a broad sense (i.e., research and innovation, telecom, environmental initiatives, energy and transport) and financing instruments. In Sweden, company-oriented financing undertakings have in the main been funded in the form of direct project grants.

Before the 2010–2006 period, the European Commission directed the member states to shift Structural Fund monies from direct contributions over to various financing forms, such as loan capital, guarantee capital and risk capital. Arguments adduced included: less distortion of competition and – through “revolving funds” – a return flow of capital and guarantee capacity. Increased access to financing capital is also a prioritised area of the Lisbon Strategy for increased competitiveness and growth within the EU.

As a result of closer cooperation between the EU structural funds and the European Investment Bank (EIB), Commissioner Danuta Hübner and EIB president Philippe Maystadt presented, in October 2005, the JEREMIE initiative.⁸ The purpose of JEREMIE is to stimulate the development of micro, small and medium enterprises (SMEs) by improving access to micro credits, risk capital and guarantees. The actions must be complementary to what is available on the market. Funds from ERDF constitute the foundation of the funding. However, at least as much domestic public co-financing is required, as well as private financing.

The starting-up of new SMEs and expansion of existing SMEs is a key part of economic growth. Most companies are, in different ways, dependent on external capital in these phases. Companies' difficulties accessing capital is discussed in both Swedish and European public debate, often under the heading of ‘the financial gap’. The OECD defines such a financial gap for SMEs as: “*the difference between the number of SMEs that could use funds productively if they were available, but cannot obtain finance from the formal financial system*”.⁹ Therefore, the idea behind JEREMIE is to reduce such gaps and thus stimulate growth.

In 2007, in cooperation with Nutek¹⁰, the European Investment Fund (EIF) completed a special country report for Sweden that investigated the possible existence of such finance gaps for SMEs.¹¹ The conclusion was that the supply of external financing has certain shortcomings, which are clearest in the companies' early stages of development. The EIF also pointed out that Sweden seems to have a complex structure involving many small and partly overlapping business-promoting players.

⁸ JEREMIE is an acronym for Joint European Resources for Micro to Medium Enterprises; see <http://www.eib.org>.

⁹ OECD, (2006), *The SME Financing Gap: Theory and Evidence*, p.11.

¹⁰ Nutek (the National Board for Industrial and Technological Development) was disbanded on 31 March 2009 and a new agency, *Tillväxtverket* (the Swedish Agency for Economic and Regional Growth), took over most of its tasks.

¹¹ EIF, (2007), *JEREMIE, Interim report for Sweden: SME Financing Gap Assessment*.

On assignment from Nutek and Almi¹² at the end of 2007 and beginning of 2008, SWECO Eurofutures AB carried out eight regional preliminary studies/requirement studies to investigate, in more detail, the existing supply structure and requirements for supplementary capital supply.¹³ The general picture the report provides is that there is a gap between the seed phase and the next phase (the phase in which commercial capital really comes into play). A need for supplementary public risk capital appears in this finance gap. The gap is estimated to be in the interval of SEK 1–2 million (c. 103,000–205,000 euro) up to SEK 10–20 million (c. 1 million–2.1 million euro). Certain regional differences also appear, for example, difficulties obtaining bank loans in the interior of the country and in small communities due to the low second-hand value of properties and industrial facilities. In these areas, there is a need for loan guarantees or supplementary loans with limited collateral.¹⁴

The latter observation underscores, according to Growth Analysis, the need to differentiate between companies' demand for capital in general terms and their demand for that part of the total amount that is venture capital.

Thus, the conclusions of the SWECO Eurofutures report echo the EIF analysis of some of the shortcomings in the external supply of financing. A requirement had been identified; the issues of implementation method and organisation had yet to be resolved.

Initial investigations were made of opportunities for forming one or more national JEREMIE holding funds. Despite major efforts, legal difficulties (i.e., Structural Fund regulations and procurement rules) meant that this alternative was abandoned. Instead, a regionally based model was selected, a model involving risk capital funds in the country's eight Structural Fund regions.¹⁵ Toward the end of 2008, in cooperation with the administering agency, the regional Structural Fund partnerships announced¹⁶ an invitation to financing players to apply for ERDF funds for part financing of the capital base of new risk capital funds.

The applications resulted in twelve funds, with financing in accordance with Table 1 below. There is an approximate total of SEK 2.5 billion (c. 257 million euro) in the Swedish action designed to increase the regional supply of risk capital. Behind the twelve funds are “Almi Invest”, “Norrlandsfonden”, “Sjätte AP-fonden” and “Innovationsbron”. Distributed per programme area, the scenario is as follows:

- *Almi Invest* is represented in: the area Övre Norrland [Upper Norrland] (“Partnerinvest i Norr AB” together with “Norrlandsfonden”); area Mellersta Norrland [Central

¹² Almi Företagspartner AB is owned by the state. The basis of Almi's mission is the need for financing and business development that is complementary to the market, where Almi is the channel for investment based on an industrial policy that promotes economic growth.

¹³ SWECO Eurofutures, (2008), *Strukturfonder för kompletterande kapitalförsörjning i Sverige. En sammanfattning av åtta behovsstudier inför JEREMIE-initiativ [Structural funds for supplementary capital supply in Sweden: A summary of eight requirement studies prior to a JEREMIE initiative]*.

¹⁴ See also Glesbygdsverket, (2006), *Småföretagandets villkor i gles- och landsbygder [Swedish National Rural Development Agency, The conditions facing small-scale entrepreneurs in rural communities]*, in which low second-hand values of properties and industrial facilities in particular are identified as an impediment to company growth in rural communities.

¹⁵ Each region developed its own Structural Fund programme that is financed by the ERDF and Swedish public funds. Each region has a Structural Fund partnership whose primary task is to prioritise among applications for project support.

¹⁶ Up to the end of March 2009, Nutek was the administering agency for the ERDF; as of April 2009, the task was assumed by the newly formed agency, the Swedish Agency for Economic and Regional Growth (Tillväxtverket).

Norrland] ("Saminvest Mitt AB"); area Norra Mellansverige [Northern Central Sweden]; Stockholm; Östra Mellansverige [Eastern Central Sweden]; Småland och Öarna [Småland and the Islands] and the programme area Västsverige [Western Sweden].

- *Norrlandsfonden* operates in the programme area Övre Norrland [Upper Norrland] ("Partnerinvest i Norr AB" together with "Almi").
- *Sjätte AP-fonden* [The Sixth National Pension Fund] is represented in area Mellersta Norrland [Central Norrland] ("Mittkapital Jämtland and Västernorrland AB").
- Finally, *Innovationsbron* is behind the three funds in the programme area Skåne and Blekinge.

Table 1: Fund projects and financing

Programme area	Fund	Total fund capital (SEK million)	Of which amount from ERDF (SEK million)	Of which amount from Swedish public sector (SEK million)	Of which amount from private sector (SEK million)
<i>Upper Norrland</i>	Partnerinvest i Norr AB	380	99	100	181
<i>Central Norrland</i>	Saminvest Mitt AB	200	50	50	100
	Mittkapital i Jämtland och Västernorrland AB	200	100	100 ^a	0 ^a
<i>Northern Central Sweden</i>	Almi Invest Norra Mellansverige AB	201	52	52	97
	Almi Invest Västsverige Värmland AB ^b	88	23	23	42
<i>Eastern Central Sweden</i>	Almi Invest Östra Mellansverige AB	335	87.5	88.5	159
<i>Stockholm</i>	Almi Invest Stockholm AB	277.9	72.4	73.4	132
<i>Western Sweden</i>	Almi Invest Västsverige AB (Västra Götaland/Halland) ^b	256	38.5	95	125
<i>Skåne/Blekinge</i>	Sydsvensk Entreprenörskapsfond I	67.8	18	18	31.8
	Sydsvensk Entreprenörskapsfond II	102	27	27	47.7
	Sydsvensk Entreprenörskapsfond III	169.5	45	45	79.5
<i>Småland and the Islands</i>	Almi Invest Småland och Öarna AB	222	46	70	106
Total:		2 499.2	658.4	741.9	1 101

Remarks:

SEK 1 million \approx 103,000 euro (March 2010)

a: Private cofinancing is not required. Behind Mittkapital lies the Sixth National Pension Fund, considered a "public commercial risk capital player". Therefore, the administering agency has no grounds for requiring that the Sixth National Pension Fund syndicate with private commercial players.

*b: Almi Invest considers Västsverige (Värmland + V:a Götalands- och Hallandslän) as a **single** fund. From a financing perspective (programme area affiliation), this has been divided into two, that is, Västsverige Värmland AB and Västsverige Västra Götaland och Halland.*

The principle for the actual investments is that the undertakings should not compete with private market players, but should play a supplementary role. The funds' investments are always linked to a private investment partner that invests *at least* an equivalent amount. The investment takes place on the same terms. "Private investment partner" refers normally to venture capital companies or business angels, both Swedish and foreign.

How active the funds are in the process of searching for appropriate investment objects (i.e., portfolio companies) varies. Certain funds intend to largely outsource the search process and negotiations about terms to private players, whereas others intend to be active parties in these processes.

Hence, shared risk and doubling of capital are what the public sector offers the private risk capital market.

As of 31 December 2009, the funds had made 28 investments and distributed SEK 46.1 million (c. 4.7 million euro) to companies. Two of the funds had not yet made their first investment.¹⁷

¹⁷ Tillväxtverket, (2010), "Kvartalsuppföljning fondprojekt t.o.m. 2009-12-31" ["Quarterly follow-up, fund projects to and including 31 December 2009"].

2 Method and procedural description

2.1 Conditions and environment

Sweden has eight regional Structural Fund programmes to promote regional competitiveness and employment (within ERDF). Before the current programme period, that is, 2007–2013, the European Commission prescribed a modified evaluation procedure with a clearer focus on learning. Such evaluation is to take place through early-stage reporting of experience and views, to the benefit of participating players and ongoing projects. The previous principle, based on “mid-term evaluation”, is considered to have contributed to results being received too late to be used to the extent hoped for. The ERDF and the EU's Social Fund have therefore decided to cease mid-term evaluations and instead employ a form of follow-up that is closer to business operations, namely “ongoing evaluation”.¹⁸

The Swedish Agency for Economic and Regional Growth (Tillväxtverket) is the administering agency for Sweden's eight regional Structural Fund programmes within the ERDF. There is essentially one general requirement for Tillväxtverket to perform/procure ongoing evaluation of the Structural Fund projects for which the ERDF's part financing exceeds SEK 10 million (c. 1 million euro). Regarding the policy instrument that the present report examines, this criterion is more than satisfied. Consequently, Tillväxtverket has decided to pursue ongoing evaluation and contracted a five-and-a-half-year assignment from the Ramböll consulting firm. Ongoing evaluation is performed in accordance with the European Commission's indicative guidelines.

Growth Analysis, by the 2009 and 2010 “Letters of Instruction” from the Government, was specifically assigned to evaluate the intervention. It is clear from the assignment that the evaluation is to serve as basic learning material in preparation for possible future undertakings of a similar nature. Emphasis is placed on experience from international research and empirical studies. In dialogue with the Ministry of Enterprise, Energy and Communications, the need for an impact evaluation – the relationship between the measure and goal fulfilment – has been identified. The Growth Analysis assignment is to be ongoing throughout the implementation period of the measure (2009–2014), including interim reports in 2010, 2011 and 2013 and a final report in 2015.

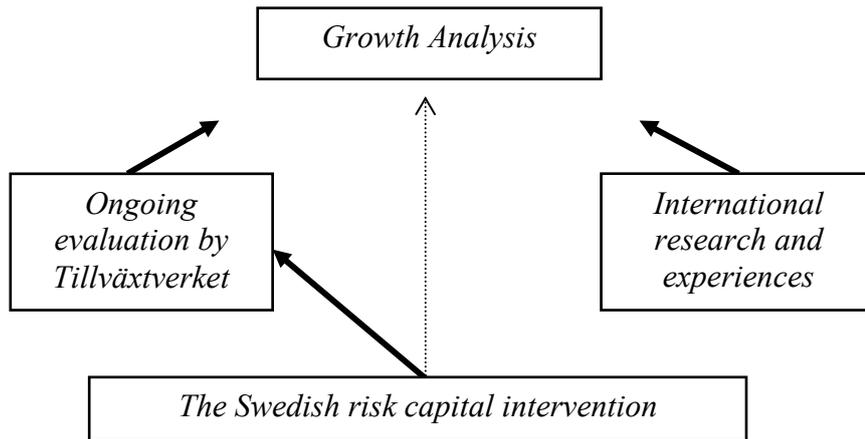
Hence there are two agencies with assignments to evaluate the risk capital intervention: Growth Analysis, with its international analysis of the operating environment and impact analysis, and Tillväxtverket, with its ongoing evaluation. To clarify issues of role allocation and maximise the supplementary effect of this arrangement, extensive cooperation began at an early stage between Growth Analysis, Tillväxtverket and Ramböll. Planning, meetings and the exchange of factual knowledge have taken place frequently and in a positive spirit.

The yearly reporting by Tillväxtverket is a significant source of information for the evaluation carried out by Growth Analysis. Through its participation in direct meetings with the funds, Growth Analysis also has access to process experience in real time. The latter must not be underestimated. Discussion of challenges, opportunities or trade-offs in these contexts cannot, or can hardly, take place ex post through document studies or

¹⁸ See, for example, European Commission, (2007), *Indicative Guidelines on Evaluation Methods: Evaluation During the Programming Period*, Working Document No. 5, April 2007.

retrospective questions in interviews or questionnaires.¹⁹ The plan is to make the international experience that Growth Analysis develops/reprocesses available to the Tillväxtverket, Ramböll and the 12 funds, both orally and in writing. See Figure 1 for a schematic description. Altogether, this should create the necessary conditions for the learning and dissemination of the experience referred to at the outset.

Figure 1: Information sources used by Growth Analysis



The figure shows the sources of information used by Growth Analysis for the assignment. International research and evaluation experiences, combined with the ongoing evaluation by Tillväxtverket (through Ramböll), are key sources for Growth Analysis. Participation in meetings with the funds assures direct access to process experience in real time (symbolised in the figure by the dotted-line arrow).

2.2 Components of the evaluation by Growth Analysis

The evaluation assignment of Growth Analysis can be seen as consisting of three parts: (i) a *knowledge retrieval* part, comprising international research and empirical findings, as well as experience of the Swedish ongoing process; (ii) an *analytical* part, comprising analysis of the preceding part; and (iii) a *part comprising feedback* to the Ministry of Enterprise, Energy and Communication, Tillväxtverket, Ramböll and the funds.

As regards the *knowledge retrieval* part, a key part of the present report consists of the research survey commissioned by Growth Analysis. This survey is presented in chapter 3 and discussed further in chapter 4. In accordance with the “Letters of Instruction”, the agency intends to proceed with some in-depth case studies of international undertakings deemed particularly relevant from a Swedish policy perspective. Growth Analysis also has access to real-time process experience through Ramböll's ongoing evaluation and, in this context, regularly participates, as previously noted, in meetings with Tillväxtverket, Ramböll and the funds. This allows it to regularly receive information on the practical work process, including discussions of difficulties, opportunities and trade-offs that arise over time.

The *analytical part* contains three primary subsections. The first of these makes use of international experience and extracts the aspects that are most relevant from a Swedish policy perspective. The second relates and compares the ongoing Swedish process with international experience – a form of benchmarking. The third performs an impact

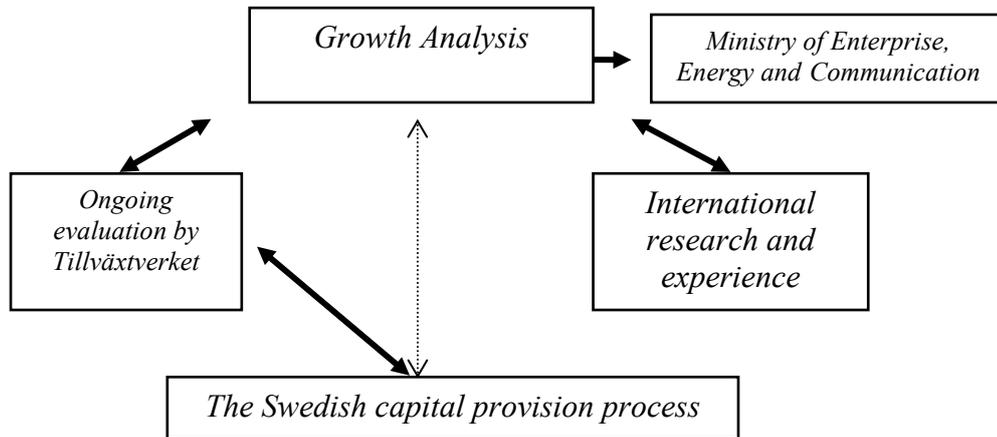
¹⁹ The reliability of received replies to retrospective questions can be questioned, based on considerations such as reinterpretation or individual ability to remember.

assessment that examines the causality between the capital intervention and the “treated” portfolio company outcomes.

The feedback part entails, on one hand, reports and possibly oral presentations given directly to the Ministry of Enterprise, Energy and Communication and, on the other, the feedback of knowledge and experience to the players in the process. Interest has already been expressed on the part of the funds, Tillväxtverket and Ramböll in accessing the research survey and the in-depth case studies. This also includes the evaluation presentations that the agency makes in external contexts, for example, at conferences and similar events.

Including the feedback part in Figure 1 above results in a more interactive picture that illustrates the bidirectional nature of the information flow (Figure 2).

Figure 2: Information flow in connection with the Growth Analysis evaluation



2.3 The reports

In accordance with the “Letters of Instruction”, Growth Analysis will report on the progress of the assignment through a number of interim reports. The present report (*Interim Report 1*) contains an international research survey and a method/procedural description. The research survey was written by Anders Isaksson, Ph.D., Umeå School of Business, Umeå University. The research survey refers to international empirical research that examines, in various ways, the subsidising/participation of public sectors in similar actions in the VC market. Earlier versions of the survey were presented and discussed at “Småföretagsdagarna” [“Small Business Days”] (in Örebro), the National Conference on Learning for Employment and Regional Growth (in Södertälje) and at an internal seminar at Growth Analysis. The research survey is presented in chapter 3, followed in chapter 4 by comments from Growth Analysis.

Interim Report 2 (2011) will deal primarily with in-depth case studies of some international actions considered particularly relevant from a Swedish policy perspective. The final selection of case studies will be made during winter/spring 2010. Basic information for this decision will consist of the knowledge survey in the present report and contacts with researchers in the field. Comparisons between the Swedish process and international experience will be presented together with reflections on the project period to

date. Relevant sections of the Growth Analysis analysis of the total capital supply situation for SMEs (according to Regleringsbrevsupdrag 2010/3)²⁰ will be included.

In *Interim Report No. 3* (2013), the agency will continue its analysis of the experience to date of the ongoing project. At this stage, indications of the structure of the portfolio companies will also be available.

In the *Final Report by Growth Analysis* (2015), the aim is to present an impact evaluation designed to answer the question of what impact the capital supply action has had, in comparison with what the situation might have been had such financing not been provided (the counterfactual situation). The report also summarises the agency's experience of the policy instrument as a whole. International experience is compared with Swedish experience. The final report concludes with policy recommendations for possible future undertakings of a similar type. It should be pointed out that this report is expected to come at a much later point, hence making it difficult to provide detailed descriptions at this early juncture.

In its Interim Reports Nos. 2 and 3 and the Final Report, the analyses by Growth Analysis will be based on its own observations and experience as well as on reports issued by the Tillväxtverket/Ramböll on its ongoing evaluation. All of the reports will include policy recommendations.

2.4 Evaluation principles and evaluation questions

2.4.1 Logical foundations of the policy instrument

It is important to focus on what shortcomings/failures that an intervention by the public sector is designed to address. The reason for a public sector action should be traceable back to a market failure (effective outcome not achieved) or to situation when a pure market solution having undesired distribution consequences. There is also good reason to discuss the difference between a problem and a market failure.

The fundamental problem that the measure is designed to address concerns entrepreneurial financing. The reports referred to in section 1.3 indicate a “finance gap” – an imbalance between supply available on the market and company demand. Assuming that these analyses are correct, certain companies' contributions to the growth and welfare of the region and nation will be smaller than their potential, or even entirely absent. It is definitely a problem and possibly a market failure as well. However, it is worth pointing out that market rationality can also be adduced in relation to market players' risk assessments. The absence of a track record, proportionally higher transaction costs for smaller investments, etc., are examples of circumstances included in the market players' risk assessment.

Briefly stated, the programme logic in this case could be interpreted, or constructed, as follows:

- Increased welfare is a national goal.
- Growth provides a larger “common pie” to distribute and hence opportunities to achieve the desired increase in welfare.
- Competitive and growing companies contribute to the nation's growth.

²⁰ Assignment no. 2010/3 in the Letter of Instruction of 2010.

- Companies require capital in order to grow. Many enterprises/entrepreneurs lack sufficient capital to fund the development and growth process. A (limited) number of them seek venture capital.
- The existing range of commercial risk capital does not suffice to meet the demand from these companies. Private players' risk assessments do not reflect an optimal level from a public-sector perspective. Consequently, there is a “financial gap”, particularly in companies' earlier development stages. There are also some geographic variations associated with this “gap”. The demand from ‘funding-ready’ companies cannot be satisfied.
- Finally, the policy instrument will (if fully used and in accordance with the ambition of the administering agency) increase the supply of risk capital in the market by approximately SEK 2.5 billion (c. 257 million euro), and thus reduce the finance gap, that is, ameliorate the identified problem.²¹

Feedback on, and problematizing of, the above points is presented in chapter 4, where the research survey is discussed from a policy perspective.

2.4.2 Discussion of aims

General aspects

“If you don't know where you're going, it makes no difference which route you take”. The slightly modified quotation from Lewis Carroll is directly relevant to these contexts.²²

Unclear goal formulations hinder the efforts of implementers. What are these efforts expected to achieve? How will they be assessed? The presence of multiple goals also creates a built-in risk of goal conflicts and delicate prioritisation trade-offs. Such ambiguities are a problem for evaluators as well. What are they supposed to evaluate against? What is a successful outcome?

Politically, this has been discussed in various contexts: for example, the *Riksdag* (the Swedish Parliament) has pointed out that goals should not be expressed in too general terms²³ and the Ministry of Finance has stated that goal formulations in the budget proposition and spending authorisations should, as far as possible, follow the SMART criteria.²⁴ According to the SMART criteria, goals should be: Specific, Measurable, Accepted, Realistic and Time-limited:

- *Specific* – they should clearly indicate what is to be achieved.
- *Measurable* – they should be possible to follow up using result indicators, key ratios or similar metrics.
- *Accepted* – they should be accepted and perceived as relevant by those whose job it is to conduct the operation in question.

²¹ How large a proportion of the total amount is “new” is debatable. Regional development measures is an alternative use of both the regional co-financing and the ERDF funds. The alternative use of the private co-financing is not known; however, in a counterfactual situation, is not inconceivable that this capital might have been at least partly used in a capital supply context.

²² The often quoted answer from the cat in Carroll L, (1870), *Alice's äfventyr I sagolandet* [*Alice's Adventures in Wonderland*].

²³ Bet. 1999/2000:FiU13, *Utvecklingen av den ekonomiska styrningen* [*Development of financial control*].

²⁴ Ds 2000:63, *Ekonomisk styrning för effektivitet och transparens* [*Financial control for efficiency and transparency*], pp 53–54.

- *Realistic* – they should be achievable.
- *Time-limited* – the time by which the goals are to be achieved must be stated.

Previous evaluation experience, however, often reveals ambiguous goal formulations, in which the aims of the SMART criteria cannot be said to have been fulfilled.²⁵

The policy instrument: regional co-investment funds

The capital intervention falls under the EU structural funds and is therefore connected to the various goal formulations in everything from European cohesion policies and the Lisbon Strategy through national strategies, regional Structural Fund programmes, regional fund projects and commercial risk capitalists, down to the individual portfolio company. Another dimension is the presence of both public and private sectors, whose goals cannot be assumed to be identical. The likelihood of potential goal conflicts must therefore be judged as significant.

From a Swedish perspective, we must not forget the existence of the *National strategy for regional competitiveness, entrepreneurship and employment, 2007–2013*. The strategy serves as the national frame of reference for the eight regional Structural Fund programmes and for government agency participation in the drafting of regional development strategies and regional growth programmes. Apart from the strategy's guiding and coordinating function, it also has the overall purpose of contributing to the creation of more competitive regions and individuals.

Based on the national strategy and the regional development and growth programmes, eight regional Structural Fund programmes were then developed in preparation for the 2007–2013 Structural Fund period. Each programme has overall goals of its own, with an associated set of indicators.

Regarding the capital intervention, each programme area has invited financing players, by public announcement, to apply for ERDF funds as part financing of such a measure.²⁶ The announcement can be seen as a general declaration of intent regarding the measure to presumptive executors. The announcement includes several formulations that could be interpreted in various as goals or intentions. The policy instrument is to provide “reverse capital flows” to be used for new actions (a formulation that in other contexts is referred to as “revolving”). Moreover, the action is to be “supplementary to the market” and “less distorting of competition” than direct corporate subsidies (grants) would be; it is “identified market shortcomings” that are to be addressed. The announcement also contains an explicit, if broad, goal formulation: “*The goal is that more companies will be launched and will grow in the regional programme area through improved capital supply at early development stages to SMEs. The established project goals are intended to correspond to the programme's indicators in accordance with the operative programme.*”²⁷

The last sentence implies that the individual fund itself should have been able to formulate its own goals in its project descriptions, within the framework of the overall goals and

²⁵ See, for example, ITPS, (2007), “Förhandsbedömning av de operativa regionala strukturfondsprogrammen” [“Preliminary assessment of operative regional Structural Fund programmes”]; Tillväxtanalys, (2009), “Resurscentra för kvinnor: En utvärdering av projektverksamheten 2002–2008” [Growth Analysis, “Women's Resource Centres: an evaluation of project activities in 2002–2008”].

²⁶ See, for example Nutek, (undated), “Utlysning – Mellersta Norrland” [“Announcement – Central Norrland”], <http://rtp.nutek.se/content/1/c4/93/60/UtlysningsbrevMellerstaNorrlandver02.pdf> [2010-02-27].

²⁷ Ibid., p. 4.

indicators of the relevant programme area. Hence, the funds' choices of indicators vary. It should also be noted that the horizontal criteria of the Structural Fund programmes, such as environmental considerations, gender equality and integration (as well as, in some cases, public health), are then included.

Growth Analysis interprets the explicit goal formulation as transferring considerable room for interpretation and regional clarification, which might possibly be the intention. Regardless of the possible underlying motives, from an evaluation perspective, it can be stated that we find a goal, a target group (geographically delimited) and funds. *The goal* is for more and more entrepreneurs to start companies and grow their companies. It is unclear how many more companies are envisioned and what reference level is intended. Nor is the desired corporate growth described in any detail. Conceivable indicators might be, for example, number of employees, payroll total, market share, net sales and profit. *The target group* is limited to micro, small and medium companies (SMEs). Hence, the number of excluded companies are not overwhelming. Large companies (usually defined as companies with over 249 employees) is a category that accounts for about 0.1 percent of all the Swedish companies. *The means* are described as increasing the supply of risk capital for the companies' early development stages. It might be thought that closer definition of "early" could have prevented any future discussion of the degree to which capital supply has reached the intended corporate segment.

In sum, the following significant formulations can be identified in the announcement:

- return requirements (the capital should revolve).²⁸
- more companies to be launched.
- more companies to grow.
- The above goals should be achieved subject to certain conditions:
- the investments should be supplementary to the market and not compete with private players.
- the investments should be carried out in early stages.
- the portfolio companies should be active in their particular programme areas.
- the portfolio companies should be within the small and medium enterprise (SME) size interval.

In addition, as previously noted, some leeway is granted to the individual fund to formulate its own goals and add indicators within the framework of the relevant Structural Fund programme. The Ramböll consulting firm has investigated the funds' application documents and conducted supplemental interviews as part of its ongoing evaluation. The results indicate that *further* goals have been added and, as expected, that there are differences between the funds. Without repeating all writings in detail, the lion's share of them can be grouped, very roughly, into two outcome/result/impact groups:

- improved regional capital supply infrastructure
- skills development of and cooperation between financing players

²⁸ Which in itself is open to interpretation. Should the capital revolve in its nominal or real value? Should a revolving return level include coverage of the funds' operating costs? (Management fee is set at 3%).

The former includes increased demand, supply and investments of competent risk capital, more private VC players and business angels. The latter includes competence enhancement and favourable development in portfolio companies,²⁹ private VC players, business angels and funds, and increased degree of interaction between these players. In addition, there are also goals linked to return (exit opportunities) and goal formulations of a more “bureaucratic” nature, such as following established plans regarding investment flows and activities concerning horizontal criteria. Put simply, most of these fund goals could be summarised as designed to promote a “better functioning regional capital supply structure”. It should also be borne in mind that behind this “aggregation goal” are fund-specific variants with associated sets of indicators.

Adding the above discussion leads to a “minimal goal scenario” that summarises most, though not all, goal formulations:

- return requirements (the capital should revolve).
- more companies to be launched.
- more companies to grow.
- enhanced competence on the part of the region's companies.
- better functioning regional capital supply infrastructure.

The above goals should be achieved subject to certain conditions:

- the investments should be supplementary to the market and not compete with private players.
- the investments should be carried out in early stages.
- the portfolio companies should be active in their particular programme areas.
- the portfolio companies should be within the small and medium enterprise (SME) size interval.
- horizontal requirements (e.g., environmental considerations, gender equality and integration).

So much for goal formulations in the announcements and by the funds. The latter will, in the course of their operations, also encounter more or less explicitly formulated goals in other players. These will include regional public co-financiers (e.g., county administrative boards, regional federations and county councils), private financing players and portfolio companies. The regional co-financiers could be expected to have a significant preference that the actions take place, and remain, within their geographic area, whereas portfolio companies and private risk capitalists could assess that a company's development might be better served by relocation of operations to elsewhere in Sweden (or abroad).

Tensions and trade-off requirements could also arise when other political demands meet commercial demands. Horizontal criteria associated with the Structural Fund programmes, such as a minimum proportion of women or persons of foreign background starting and/or

²⁹ Apart from the goal of growth in portfolio companies, there are also formulations about increased professionalisation, expertise and development in these companies. This is broken out of the larger category, “better functioning regional capital supply structure” and reported separately in the “minimal goal scenario”. The motive is that the competence goal for companies should contain aspects that do not necessarily fall within better capital supply structure.

leading new companies, could be difficult to handle vis-à-vis private investors who are primarily interested in the level of return and exit options.

Individual entrepreneurs and business people might also have their own goals for their companies that would not necessarily echo those of the funds and private risk capitalists.

Summary

The above discussion deals with ambiguities in goal formulation and with risks of goal conflicts. From an evaluation perspective, the goal scenario presented becomes a challenge that must be taken into consideration. From an implementation perspective, this does not imply that problems *need* arise; however, a clearer goal structure would definitely have helped the funds, clarified the expectations placed on them and reduced the need for complicated trade-offs.

Clear game rules are always meaningful. It is therefore extremely important that the goal structure be discussed and clarified as much as possible. Judging from conversations at meetings held to date between the funds, Tillväxtverket, Growth Analysis and Ramböll, there is awareness of this, and such discussions have begun, which Growth Analysis considers promising and productive.

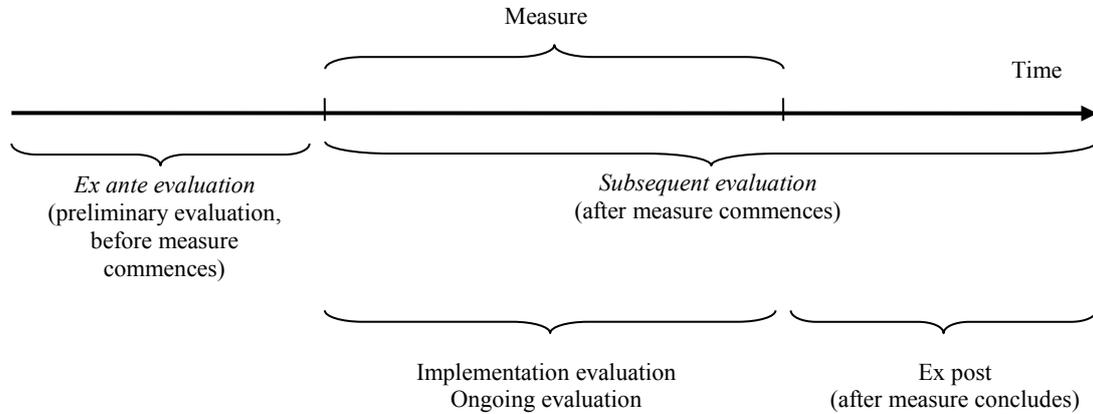
2.4.3 Different types of evaluations

Evaluations can be defined and categorised in many different ways.³⁰ Categorisations can be made based on e.g. a *time dimension* (when, in relation to the implementation of a measure, an evaluation is carried out); *aims and purpose* (e.g., description, causal relationships, including alternative sequences of events, balancing and valuing advantages and disadvantages for public finance, and learning perspectives); *evaluator's connection to the measure* (internal or external); *selection of method* (usually qualitative or quantitative), etc.

It is not productive to appoint some category or evaluation as generally better than another or to recommend a “universal method”. A more appropriate approach is simply to select the tool in accordance with the task, that is, to let the particular questions involved determine the choice of evaluation. The evaluation assignment of Growth Analysis generates questions for which several types of evaluation approaches are required. First, however, let us present a brief introduction before developing this argument further.

³⁰ See, for example, Vedung E, (1998), *Utvärdering i politik och förvaltning [Evaluation in politics and administration]*; Storey DJ, (2000), “*Six Steps to Heaven: evaluating the impact of public policies to support small business in developed economies*”; Karlsson O, (1999), *Utvärdering – mer än en metod [Evaluation: more than a method]*.

Figure 3: Evaluation categorisation (general)



Source: Adapted from ITPS (2009)

A relevant basis for such an introductory discussion could be the former governmental agency ITPS reports that deal with methods for developing regional growth policies.³¹ An evaluation can, as Figure 3 above shows, occur at different times relative to the implementation of the measure. A preliminary sorting into two primary groups is based on the time when the measure is commenced.

Accordingly, an *ex ante* evaluation is carried out *before* the measure commences, whereas subsequent evaluations are carried out *after* the measure commences. Subsequent evaluations can in turn be sorted into two subgroups: (i) those carried out during the period when the measure is implemented (implementation evaluation and ongoing evaluation), and (ii) those commencing *after* the measure is completed (ex post).

Ex ante evaluation is intended to supply basic information for a potential measure and to provide support for deliberations as to whether a measure should be introduced and how it could be designed. In public contexts, this might occur as a formal *ex ante* evaluation within the EU structural funds³² or in the form of other studies, legislative bills or the like. Sometimes, results from earlier research and evaluations can be explicitly included in such material. It is desirable that evaluation opportunities be taken up for discussion at this early juncture and included in the design and planning.

³¹ ITPS is an abbreviation for "Institutet för tillväxtpolitiska studier" ["The Swedish Institute for Growth Policy Studies"]. A governmental agency that was disbanded on 31 March 2009. Unless otherwise indicated, sections 2.4.4 and 2.4.5 are based on ITPS, (2004), "Den nya regionala utvecklingspolitiken – Hur att följa upp och effektutvärdera" ["The new regional development policy: how to follow up and evaluate its impact"]; ITPS, (2009), "Metoder för att utvärdera den regionala tillväxtpolitiken" ["Methods for evaluating the regional growth policy"]; and Delander L & Månsson J, (2009), "Valet av utvärderingstyp beror på vilken fråga som ställs" ["The choice of evaluation type depends on the question under consideration"].

³² See, for example, ITPS, (2007), "Förhandsbedömning av de operativa regionala strukturfondsprogrammen" ["Preliminary assessment of the operative regional structural fund programmes"].

Implementation evaluation is carried out during the period in which a measure is implemented and could be said to open the lid of the “black box” of implementation, through the study of the decision and implementation processes. Such an evaluation poses questions about, for example, purpose, organisation, players, resources, procedures, problems, difficulties and conflicts of interest.

The concept of *ongoing evaluation* has had significant impact in the new programme period of the EU's structural funds. As the name indicates, the reference here is to evaluation occurring during the period in which the measure is implemented. The concept of ongoing evaluation, however, is broader than that of implementation evaluation. Evaluations traditionally carried out after measure completion (e.g., goal fulfilment, impact or efficacy evaluation) could, if done during measure implementation, be included in this concept. In EU contexts, stress is placed on aspects such as learning and experience feedback between evaluators and those affected, flexibility, deeper understanding and – in particular – development-promoting actions. The evaluation must be continuously useful and improvement oriented. The approach provides an opportunity for the evaluator, via interactivity, to influence and contribute to goal fulfilment, and to “*serve as a 'critical friend' who asks questions about project goals and programme logic*”.³³

Ex post evaluations are carried out after measure completion. In such evaluations, the evaluators look back at the measure and try to assess its outcome – as in the case of “outcome evaluations”. Outcome evaluations usually take place *ex post*, but can also, as pointed out above, take place during an ongoing measure (“ongoing evaluation”). The results of outcome evaluations conducted during ongoing measures can then be fed back to the implementation process and be used for changes/improvements in the remainder of the implementation.

Typical questions in outcome evaluations are: whether, and to what degree, the aim of the measure has been achieved; to what degree the outcome was caused by the measure; and what is the value of the effect of the measure relative to its cost.

Outcome evaluations are usually grouped in three subgroups (in ascending degree of problematizing): *i*) goal evaluation, *ii*) impact evaluation and *iii*) efficiency evaluation. A goal evaluation assesses whether the goals of the measure were achieved without saying anything about causal connections between the measure and the observable result. In an impact evaluation, such a discussion of causality is added by comparing the actual sequence of events implemented (involving implementation of the measure) with an alternative sequence of events (the counterfactual scenario) in which the measure was not implemented. Any difference between the two sequences of events is defined as the effect of the measure. An efficiency evaluation includes a public finance cost–benefit analysis in which, put simply, the value of a measure's effects is compared with its costs. It is then the broader public finance revenues that are compared with the broader public finance costs.

³³ Nählinder J, (2009), “Följeforskning i ett innovationsprojekt “ [”Ongoing evaluation in an innovation project”], p. 190.

2.4.4 The evaluation by Growth Analysis

Fundamental questions

It is proposed that the evaluation to be carried out by Growth Analysis adopt a broad-based approach and an explicit learning perspective. Some examples of fundamental questions that the evaluation should answer are in the following areas:

- Background: *Why* is this investment being carried out?
- Structure: *What* is the design of the measure?
- Process: *What* take place during the investment period?
- Outcome: *What* results and effects can be observed?
- Learning: *How* can the aggregate experience contribute to a knowledge base that is relevant to policy? Such learning also involves, apart from experience of this specific investment, input from the research survey and empirical lessons from other international governmental capital interventions.

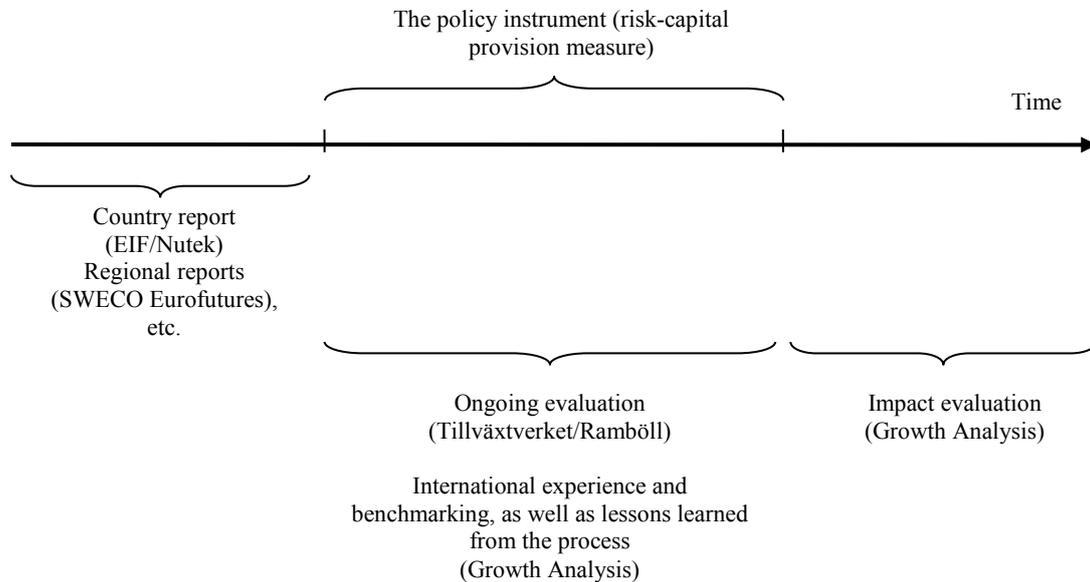
Categorisation

As previously discussed, the evaluation assignment of Growth Analysis generates questions for which several types of evaluation approaches are required. First, international experience of research and evaluation is to be retrieved, compiled and set in relation to the Swedish capital intervention. Second, reflections and policy recommendations based partly on Ramböll's ongoing evaluation and partly on the evaluator's own observations of the Swedish implementation process are followed through and included in the agency's interim reports. Third, an impact evaluation should be carried out to investigate any causal connections between the policy instrument and the portfolio companies' performance.

The first approach could actually be categorised as an ex ante evaluation and as such partly constitute a basis for measure design. Now, however, the measure has already been initiated and must therefore be considered part of an implementation evaluation with feedback to the players involved. This evaluation category also includes the analysis based on process experience. The impact evaluation will be performed after completion of the measure in 2015, and is thus a typical ex post evaluation.

The evaluations carried out with respect to the capital intervention may be schematically described in accordance with Figure 4 below.

Figure 4: Evaluation categorisation (risk capital supply)



Studies carried out in 2007 and 2008 to investigate the possible existence of a finance gap for SMEs in Sweden as a whole and on the regional level can be added to the preliminary evaluations category. Accordingly, the Growth Analysis evaluations are found to serve as both implementation and ex post evaluations.

The implementation evaluation

VC researchers Murray and Lingelbach claim that public sector organisations are generally fairly poor at learning from their own experience or from the experience of corresponding bodies in other countries.³⁴ If this is true, it is unfortunate: a cumulative effort should not be restricted to the academic context, but also be an inherent part of the design of policy measures. The Growth Analysis agency's retrieval of international research and evaluation experience can be a way to contribute to such learning, even if customary caution must be observed in deriving lessons from actions in other institutional contexts.

An implementation evaluation attempts to illuminate the actual decision and implementation processes. Examples of questions touched upon could be linked to areas such as the background of the measure, the players involved, the allocation of roles and responsibilities, problems and obstacles that arise over time, possible corrections and changes initiated and goal discussions. Hence, an implementation evaluation highlights the processes that affect the outcome, as opposed to outcome evaluations, which focus on the actual results. An implementation process is often far from linear and straightforward. It is more likely in line with the following characterisation by professor Evert Vedung: "*The processes that give rise to political results are complicated networks of interacting*

³⁴ Murray G & Lingelbach D, (2009), "Twelve meditations on venture capital".

factors.”³⁵ From a learning perspective, there is much to gain from such an outlook, particularly in terms of what actions could conceivably improve the sequence of events.

Regarding the policy instrument in question, there are good opportunities to learn from experience of the process. For one, experience is reported regularly through Ramböll's services – experience that is relayed to Growth Analysis. For another, regular meetings are held involving representatives of all funds, Tillväxtverket, Ramböll and Growth Analysis. This provides direct access to the discussions that take place. On these occasions, feedback of experience from international research and evaluation is planned. Hence, learning can take place in both directions. This model also creates the necessary conditions for Growth Analysis to regularly compare development in the Swedish context with international experience.

Apart from creating understanding of the process, the model also provides an opportunity to contribute questions and views to Ramböll's interviews, ensure that underlying data required for evaluations is collected, etc.

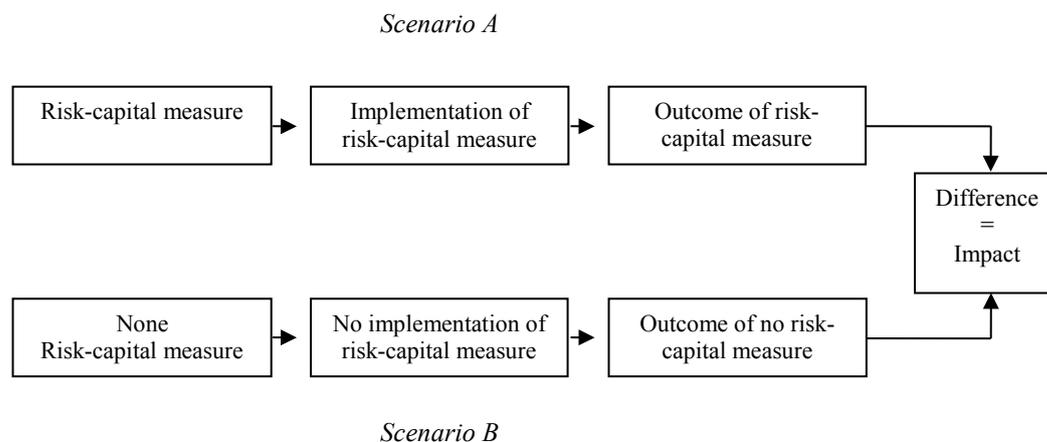
Impact evaluation

The implementation evaluation presented above can provide key information on how the process influences possible effects. In line with the preceding goal discussion, one desired outcome is that the funded companies (i.e., portfolio companies) should grow and develop favourably.³⁶ Even if such a development could actually be observed, it would be necessary to know if it were the actual intervention that led to the achievement of the goal.

The Final Report from Growth Analysis (2015) will investigate the relationship between goal achievement and measure (i.e., an impact evaluation). The basic principle of an impact evaluation can, as Vedung puts it, be related to the question of the action being studied, “*causally lead[ing] to consequences on the outcome level.*”³⁷

To answer that question, it is necessary to study two sequences of events (see Figure 5): what actually happens (scenario A) and an alternative, counterfactual, scenario, in which

Figure 5: Schematic analysis model of impact evaluation



³⁵ Vedung E, (1998), *Utvärdering i politik och förvaltning [Evaluation in policy and administration]*.

³⁶ In terms of, for example, number of employees, payroll total, turn over and added value.

³⁷ Vedung E, (1998), *Utvärdering i politik och förvaltning [Evaluation in policy and administration]*, p. 32. (The quote is translated from Swedish).

no intervention occurs (scenario B).

The transition from scenario B to scenario A is called, in evaluation contexts, a measure. Implementing a capital supply measure becomes, in this terminology, transitioning from a scenario in which no risk capital intervention occurs to one in which it does occur. The difference between the outcomes of these two scenarios is the impact of the policy instrument.

In an impact evaluation, it is therefore necessary to find, in addition to studying goal achievement in the companies that actually received capital supply, a situation that could be equated with the same or other comparable companies *not* having received any capital supply – i.e., the counterfactual situation.

Precisely to find or construct an appropriate counterfactual situation is a major challenge in impact evaluations. In certain cases, the evaluator is involved in the decision-making process at an early stage and can use *randomised experiments* or *experimental design*. In these cases, a certain number of objects, such as companies, are assessed as appropriate for investment of risk capital. Of this number (of appropriate candidates), a small group is then randomly selected – a group that *in fact* will receive the action. In these cases, the counterfactual condition consists of the companies that qualified for the first, larger group (i.e., appropriate candidates) but that ended up not receiving the financing in the random selection. The great advantage of the experimental design is its high internal validity. In the case of capital supply, this randomisation was not done, so a complete experimental design is not possible.³⁸

Quasi-experimental design could be used if the evaluator enters the picture after the project has begun or even after it has been completed. At this juncture, funds/private risk capitalists have identified a number of companies, evaluated them and assessed them as appropriate for investment. More than anything else, such a design would entail problems of selection – that is, drawing the line between companies that will receive financing and those that will not. It is highly likely that such a selection was not random (if it had been, experimental design could have been used), but rather that the selection was made systematically. Difficulties then arise in differentiating the effect of the action in itself from the effect of the actual selection.

There are certain characteristics on both the demand and supply sides that create a systematic selection. This can be illustrated by a hypothetical project. Assume that outcome y of a certain measure is sought. Assume further that the measure to be studied has no effect (i.e., the treatment effect is zero) and that characteristic x in conceivable companies or entrepreneurs is of documented great importance in achieving outcome y . The following occurs: (i) companies/entrepreneurs better equipped as regards x than the control group apply to receive a benefit under the measure; (ii) the executor of the measure in question has found a systematic method for selecting companies that are better than the control group as regards x when they confirm their participation in the measure. In both cases, the companies that participate in the measure would perform better than the control group – even though the measure in itself was without effect.

The above example involves two aspects. Firstly, *self-selection*, that is, certain characteristics of companies/entrepreneurs that lead them to decide to actively pursue the

³⁸ To our knowledge, no evaluations in the field of growth policy have been conducted involving an experimental design. On the other hand, it is relatively common in the labour market field; see, for example, Hägglund P, (2005), *Natural and Classical Experiments in Swedish Labour Market Policy*.

funding opportunity. Secondly, *administrative selection*, that is, characteristics of the companies' applications or of the companies themselves that have resulted in just these companies being selected for funding.³⁹

Both types of selection make it impossible to easily select companies for the control group and thus constitute the counterfactual condition. For the selection to be made, there must be information on how the selection is carried out – for example, common traits of the companies that actively seek risk capital in terms of age, size, industry, net sales, localisation, etc. If such information is available, either through direct matching (the twinning method)⁴⁰ or through statistical models, it can be predicted whether the companies may apply⁴¹. In this way, it is possible to “create” a control group – a counterfactual situation.

As regards the administrative selection, it is important to study any applicable guidelines for decisions on funding and investigate how this is *actually* done (any differences between formal guidelines and developed practice must be noted). If this information does not exist, it is then considered to be a question of “unobservable heterogeneity”. This refers to factors of significance for the selection over which the evaluator has no control. If the selection is made on the basis of unobservable characteristics, the methods currently used to evaluate quasi-experimentally designed measures will not work either.⁴²

The above selection discussion reveals the methodological difficulties resulting from the identification of a counterfactual condition. In risk capital contexts, the entrepreneur's personal characteristics are often stressed as significant aspects of the underlying valuation that leads to a decision to fund or not. The focus of the action on early-stage funding and on a significant portion of new companies also implies that “track record” expectations must be kept low. Naturally, this affects the opportunities to deal with the existence of administrative selection.

A third solution, if a matching-based quasi-experimental approach proves impossible, would be to use a non-experimental design, for example, measurements made before and after the action. This gives a good estimate of impact, provided it is possible to control for all outstanding factors, which is usually not the case. The problem with this type of design, then, is that it has low internal validity – that is, it is difficult to claim that the impact really resulted from the intervention we intend to study.

Based on the assignment and our current position in time, Growth Analysis finds that one of the quasi-experimental designs for an impact evaluation should first be investigated more closely. Within the framework of such an investigation, the initial focus should be on the processes that lead to funding: What is it that leads certain companies, and not others, to seek risk capital? What are the funds' and the risk capitalists' decision and ranking processes like? Differences in how active the funds intend to be in seeking suitable investment objects have been indicated. How great are these differences in practice? Are

³⁹ See, for example, Heckman J & Robb R, (1995), “Alternative methods for evaluating impacts of interventions”.

⁴⁰ See, for example, Norrman C & Bager-Sjögren L, (forthcoming), “Entrepreneurship policy to support new innovative ventures: Is there any impact?”.

⁴¹ See, for example, Gadd H, Hansson G & Månsson J, (2009), “The relation between firm subsidy and success: does regional context matter?”.

⁴² In quasi-experimental design, there are several approaches with similar fundamental principles. Some of them are matching based on characteristics (the twinning method), matching based on probability of being selected (propensity score) and studies in time proximity (regression discontinuity).

there sufficient observations (i.e., funded portfolio companies) to permit comparison as to whether search strategies influence possible effects? Are there enough observations to enable regional analyses?

A decision on a more specific evaluation design must wait until the above questions have been answered. Only then will it be possible to determine whether the selection (self-selection versus administrative selection) is steered by characteristics that are observable in available data resources, or whether it mainly concerns non-observable characteristics. Depending on the answers, certain aspects may even need to be examined using a qualitative approach.

3 The state as venture capitalist: A compilation of international empirical research

3.1 Background, purpose, method and disposition

3.1.1 Background

The knowledge survey was written by Anders Isaksson, Ph.D., Assistant Professor at the Umeå School of Business, Umeå University. In the 1999-2001 period, Anders Isaksson served as special advisor at the Ministry of Enterprise, Energy and Communications, for risk capital and entrepreneurship, and concurrently held administrative positions at Nutek, Almi and Industrifonden. He obtained his Ph.D. from Umeå University in 2006, with the dissertation *Studies on the venture capital process*.

The knowledge survey is part of the Growth Analysis' evaluation assignment.

3.1.2 Purpose

The purpose of the chapter is to present a review of the empirical research investigating the effects of public sector intervention in the venture capital market by contributing to the supply of equity capital (risk capital).

3.1.3 Method

Methodologically, the assignment is limited by the time budgeted for the project. Consequently, no data collection or evaluations were undertaken specifically for the project. The assignment is based solely on the literature surveyed and on my previous research and experience in the area. My practical experience encompasses work as special advisor on risk capital issues at the Ministry of Enterprise, Energy and Communication. My scientific publications include my doctoral thesis (see Isaksson, 2006), my study of the effects of venture capital in Sweden (Isaksson, 1999) and my work on the seed-capital situation in the Nordic countries (Isaksson, 2001).

The literature survey was conducted in accordance with traditional scientific practice (see Hedman, 1999). The resources I used included various available databases, for example, Business Source Premier (EBSCO), Social Science Research Network (SSRN) and Google Scholar. My primary references were studies published in scientific peer-reviewed journals and conferences. Regarding empirical evaluations of various government VC programmes, however, most of these are not published in scientific journals, but rather ordered from and published through various government agencies. Finding these evaluations has entailed a long chain of references and searches. In particular, this case (though also for the report generally), an extremely important source for the work has been my own network of researchers, officials and practitioners in the area who have given me tips on studies and reports that could support this project. Here, I would like to make particular mention of Jörgen Lithander (Growth Analysis), Sofia Avdeitchikova (Ramböll) and, especially, Gordon Murray (University of Exeter Business School).

3.1.4 General chapter outline

The research review is based on empirical studies of public sector support/participation in the VC market by contributing to the supply of equity capital (proprietor's capital).

The chapter consists of the following parts:

1. A *theoretical platform* in which various theoretical perspectives on public sector participation in the VC market is discussed.
2. The current situation of *empirical research* into public sector programmes to increase the supply of capital (risk capital) to companies.
 - a. Programme background and design
 - b. Programme evaluations and demonstrable results
 - c. Policy-relevant learning
3. A *critical summary discussion* of the results and lessons learned from the literature survey.

The chapter concludes with some suggestions for more in-depth studies that might be relevant from a Swedish perspective.

3.2 Venture capital and risk capital: some introductory concepts and definitions

Discussions of government risk capital programmes tend to make it clear that this is an area often characterised by conceptual confusion. Therefore, I think it is important to begin the report with a general "lesson" in the 'risk capital' concept (see also Isaksson 1998, 2006).

Some of the most important points are:

- *Risk capital is the same as proprietor's capital.*⁴³ Whoever infuses risk capital into the company (public players as well as private players) becomes a partner in the company.
- *Government risk capital is not a form of government grant within the economic policy.* Risk capitalists (public and private alike) obtain the same return on their investment as do the company's other shareholders.
- *The venture capital market is a subset of the risk capital market.* All VC investors are risk capitalists, but not all risk capitalists are VC investors.

3.2.1 Venture capital and risk capital

Venture capital refers to investments in companies that are not publicly listed (i.e., listed on an Exchange or other financial market). While the majority of any VC investment generally consists of proprietor's capital, certain intermediary forms between proprietor's capital and external capital (mezzanine capital) are also commonly found, for example, convertible loans or debt instruments with the option to subscribe for shares.

Consequently, a VC investment implies that the investor becomes (or has an opportunity to become) a shareholder in the company.

⁴³ Some Swedish reports actually use the concept "ägarkapitalister" ("proprietary capitalist") instead of the – in Swedish – linguistically less manageable "venture-capitalister" ("venture capitalists") or the ambiguous "riskkapitalister" ("risk capitalists"). (See, e.g., Sweco Eurofutures, 2008).

Venture capital, however, is not only an investment of capital, but also presumes that the investor (i.e., the VC company) plays an active ownership role, for example, by maintaining representation on the company's board of directors. Finally, the VC investment is also usually time-limited in that the VC company intends to exit – divest its investment – within the foreseeable future (usually within five to seven years).

The definition of “venture capital”, however, is not exact. For certain (usually American) players, “venture capital” refers exclusively to investments in hi-tech companies in extremely early stages of their life cycle (i.e., the seed and start-up stages). For other (usually European) players, “venture capital” refers to all forms of risk capital investments in unlisted companies. In the past few years, however, the two perspectives have become closer to one another.

Venture capital companies are then companies that have specialised in contributing active business-development support (risk capital and expertise) to companies with growth potential.

The companies in which the VC company invests are usually referred to as *portfolio companies* because VC companies typically spread their risk over a portfolio of investments. The combination of the portfolio company's advantages (e.g., the product, entrepreneur and market) with the VC company's capital and expertise will hopefully result in full realisation of the portfolio company's growth potential. When the desired development is attained, or when the collaboration between the VC company and the portfolio company no longer provides added value, the VC company realises its investment (the VC company's exit). Since the investments are made in growth companies, it follows that the returns on VC investments come primarily from the capital gain realised upon exit. Usually no dividends are received over the duration of the investment, as it is usually necessary to reinvest any surplus generated by the portfolio company to fund further growth.

The concept of *risk capital* is often used as a synonym for “venture capital”, which is not entirely correct. A VC investment is a form of risk capital investment. Not all risk capital investments are venture capital, however. Risk capital includes the company's own proprietor's capital, plus mezzanine capital. “Proprietor's capital” is also called “risk capital” because of the genuine risk assumed by the company's shareholders in relation to the company's other financing providers (lenders). It is the proprietor's capital that takes the first hit, should the company become insolvent. Regardless of whether or not the company generates a profit, it must always meet its interest obligations, whereas the company's shareholders only receive a dividend if it is possible in view of the company's ongoing development. The conclusion, then, is that the venture capital market is a subset of the risk capital market. Given that even share purchases on, say, the Stockholm Exchange, are risk capital investments, one would be justified in saying that most risk capital investments are not venture capital.

A company can be funded with either risk capital or borrowed capital. The primary difference between these forms of finance is that the investor who invests risk capital assumes a higher risk, but has a higher anticipated return than other financing providers. One exception to this fundamental distinction is the government credits extended to certain companies, through, for example, Almi and Industrifonden.⁴⁴ These institutions provide,

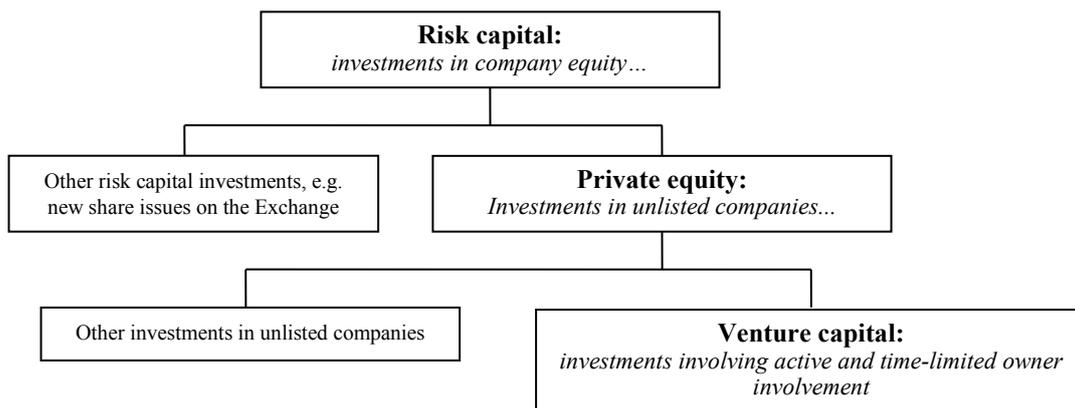
⁴⁴ Almi Företagspartner AB is owned by the Swedish government and is the parent company of a group consisting of 16 regional subsidiaries, Almi Invest AB and IFS Rådgivning AB. Almi includes 40 offices

among other instruments, conditional loans that, in the event the project for which the loan was extended fails, are usually written off. These government credits might then be regarded as a kind of “*risk-willing credits*”. Since these lenders assume even higher risk than that assumed by the company’s owners, banks and other financing providers usually consider the high-risk credits as proprietor’s capital (i.e., as tending to increase the debt/equity ratio). This creates an obvious risk, which of the term “venture capital” being used in public debate, when what is really meant would be “government risk-willing credits”. A key difference between the latter and venture capital is that infusion of venture capital entails the addition of new active shareholders. Venture capital also often entails higher growth requirements than do risk-willing credits. At the same time, these credits imply, just as do other loans, that the company must meet interest obligations regardless of whether it generates a profit. To compensate for the high risk, government high-risk credits often carry a higher interest cost than do traditional bank loans.

Another concept that is gaining currency and requires definition is *private equity*. “Private equity”, too, is often used as a synonym of “venture capital”. Private equity, like venture capital, refers to risk capital investments in companies that are not publicly listed. The difference lies in the fact that private equity usually involves later-stage investments (e.g., turnarounds and buyouts) and does not necessarily imply a similarly active degree of owner involvement in the company invested in. This distinction is made by, for example, the European Private Equity & Venture Capital Association (EVCA). Increasing numbers of financial players are attracted to investments in companies that are not market listed, and the supply of private-equity funds is growing.

Figure 6, below, is intended to clarify the difference between risk capital, private equity and venture capital.

Figure 6: The difference between risk capital, private equity and venture capital (the venture capital market is thus a subset of the risk capital market)



The literature often distinguishes between formal and informal venture capital. *Formal venture capital* consists of formal VC companies – that is, organised companies that

across Sweden. Main business areas are: Advisory Services, Loans, Venture Capital and Incubation. Industrifonden is an investor in growth companies founded by the Swedish government. It is a foundation that operates on a commercial basis without outside capital contributions. The foundation’s capital is kept intact. All surpluses are used for new investments.

specialise in VC investments. *Informal venture capital* refers to VC investments made by individuals using their own funds. These informal VC investors are often referred to as *business angels*⁴⁵ because there tends to be a perception of these investors as philanthropic do-gooders rather than rational investors. Research into business angels (see, e.g., Landström, 1993; Mason and Harrison, 2000; Stevenson and Coveney, 1996) shows that they are often corporate leaders who are gradually stepping away from or have left a business career, and who are using their experience, networks and accumulated wealth to invest in small companies. Even though the motivation behind their investments is primarily financial, the pleasure of helping small companies succeed is often cited as a driving force for business angels. Moreover, business angels usually act alone and carry out more sporadic and smaller investments in early stages, compared with the formal VC companies. In practice, however, the difference between a business angel and a formal VC company can be fairly vague. E.g. are business angel investments often made through angel-controlled companies, companies that might easily be considered formal VC companies. In the past few years, formal business angel networks have begun to arise and, considering their formal organisation, such networks can sometimes be considered as VC companies.

Exit strategies

A fundamental characteristic of all VC companies is that they intend to sell their investment within the foreseeable future – that is, carrying out an exit. There are several ways in which a VC company can carry out an exit. The most desired exit routes, however, tend to be one of the following two.

1. Initial public offering (IPO): The portfolio company is listed on a public exchange or other financial market. The VC company, however, does not sell its shares directly when the company is listed, but rather waits, usually from six to twelve months, before divesting its holdings in the portfolio company. The reason why the VC company does not sell its entire holding directly when the portfolio company is listed is usually the existence of a “lock-up agreement” with the stockbroker.
2. Sale of the entire company to an industrial buyer (trade sale): With this exit, the entire company is sold to a third party in exchange for cash, shares in the purchasing company, or other assets. The buyer is often a large established company that requires the technology or market to which the portfolio company has access.

For entrepreneurs who accept VC, it is important to be aware that the process will involve an exit, which usually also implies that the entrepreneur loses control (entirely or partially) over his or her company.

Ownership structures of the venture capital company

When roughly categorised by ownership structure, there are three forms of VC companies: private, government and group-owned.

Private venture capital companies are mainly owned by individuals and companies that manage capital from external investors, for example, pension managed funds. In Sweden, the number of private VC companies has risen sharply over the past few years and currently forms the largest group of VC companies. However, parts of private VC

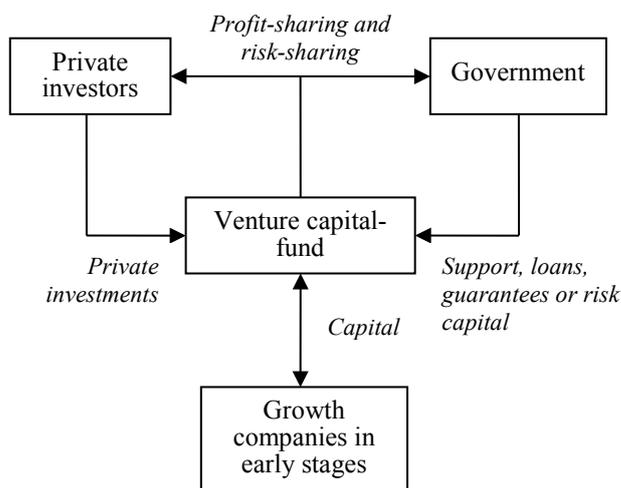
⁴⁵ Sörheim & Landström, (2001), however, emphasise a distinction based on different definitions of business angels and informal investors (angel investors constitute a minority of the total number of informal investors).

companies are often owned by large companies or government institutions. The capital that private VC companies manage usually comes from institutional investors, such as insurance companies, pension funds and large companies.

Group-owned venture capital companies (captives) are part of a group whose primary operations are not venture capital. These might be anything from subsidiaries to banks, insurance companies or investment companies, to units or departments of an industrial group. In recent years, an increasing number of publicly listed industrial companies has become interested in VC activity, partly as a way to manage capital, and partly as a way to control innovative achievements in strategically important areas. Venture capital activity within the framework of a traditional industrial company is usually referred to as “corporate venture capital”. The main difference between traditional venture capital and corporate venture capital is that corporate venture capital is usually invested with a focus on the group's overall strategy, whereas traditional venture capital is more concerned with the return on the investment portfolio.

Government venture capital companies are owned primarily by government interests. In Sweden, the government has always been one of the most active players in the VC market, ever since the appearance of “Företagskapital” in the mid-1970s. Two large government players are “Industrifonden” and the “Sjätte AP-fonden” [“Sixth National Pension Fund”], which make VC investments both directly and indirectly through wholly or partly owned VC companies. In recent years, government VC undertakings have increasingly consisted of co-investment projects in which the government invests in private VC funds (see Figure 7 below).

Figure 7: A general diagram showing a co-investment structure (hybrid fund) in which the government co-invests in a VC-fund operated by private investors



Corporate (organizational) form of venture capital companies

Historically, Swedish VC companies have tended to be companies whose owners have also been the ones who invested risk capital into the portfolio companies. In the past few years, however, VC companies with a more classic American corporate form have become increasingly common. These VC companies consist of a *management company* that establishes one or more *venture/capital funds*. In these funds, external investors can then

invest capital, after which risk capital from the fund is invested in selected portfolio companies. The external investors are usually institutional investors. The management company manages the funds and is responsible for all contacts with the portfolio company, from identification of investment objects to exit. Remuneration to the management company usually consists partly of a fixed management fee (depending on the size of the fund) and partly of a share of the return obtained from the fund's investments. The management company or *partners* (partners in the management company) can also contribute a certain portion of the VC fund's capital. The investors' investments and their returns may occur in succession, depending on the investments and the exits. Another common arrangement is that the investments are made in conjunction with the VC fund's formation and the profit is usually distributed when the fund is dismantled, which takes place within a period agreed on in advance.

3.3 Theoretical platform

This chapter begins with a discussion of various theoretical perspectives on public sector participation in the VC market by contributing to the supply of risk capital (equity capital). A key issue here is to try to explain the theoretical basis on which a public sector action would be justified. What adverse consequences could theoretically be predicted?

The economic argument for public sector action is based on the assumption that an underlying market failure has created a finance gap (equity gap) for growth companies in the early stages of their development. If the risk capital market worked perfectly, this would imply an "optimal" distribution of resources and there would then be no economic reasons for action. If, on the other hand, markets were non-existent or poorly functioning, a government action to restore market functioning would be justified.

There are many theories that can be used, in various ways, to explain how and why the risk capital market functions as it does and that can also provide arguments both for and against government market action. Key theoretical frameworks in this respect include growth theory, cluster formation theory, agency theory and asymmetric information theory.

3.3.1 Growth theories and clusters

The Swedish growth school is a Swedish school of economic thought, its most famous exponent being Professor Erik Dahmén. Its theoretical structure shows a clear influence of Schumpeter and other members of the "Austrian school". This tradition stresses that economic growth is a developing process in which entrepreneurship and innovation play a central role.

In market-oriented entrepreneurship research, the importance of contacts and networks for company growth and survival has often been emphasised. Such networks tend to be even more significant in more compact industrial districts. From thought on industrial districts, Porter (1990) popularised the concept of "clusters". Cluster theory is an umbrella term for various theoretical explanations of how and why certain regions tend to attract players. From cluster theory we know that capital and expertise tend to become commingled in groupings, blocks or systems. Dahmén developed the concept of "development block" (e.g., Dahmén, 1950), Eliasson developed the concept of "competence bloc" (Eliasson, 1990) and Carlsson spoke of "technology system" (Carlsson and Stankiewicz, 1991).

Dealing with these theoretical concepts and scientific contributions would require an entire report. It is clear, however, that many of the ideas promoted by researchers such as Dahmén, Eliasson and Carlsson are supported by VC research and provide concrete

arguments to policymakers. Florida and Kenney, for example, emphasise the significance of networks and clusters for the VC industry:

“Data presented herein make it reasonably clear that venture capital firms tend to cluster in two distinct types of areas: those with high concentrations of financial resources and those with high concentrations of technology-intensive businesses. The active nature of venture capital investing has ensured that the industry is relatively ‘fixed’ spatially, when it could in theory be footloose. Venture capital investing is dependent upon tremendous information sharing between venture capitalists, entrepreneurs, consultants and a wide range of related actors who operate as networks to locate deals, organize companies, establish investment syndications and so on. Because of the intensive nature of this information flow, these venture capital networks tend to be personalised, informal and localised. Further, the relationship between venture capital firms located around concentrations of technology businesses and those in financial centers is to some extent symbiotic.” (Florida and Kenney, 1988, p. 34).

Lerner (1999) also recognised this pattern in his evaluation of the American SBIC system:

“This pattern, however, was not uniform. The superior growth of SBIR awardees was confined to firms based in ZIP codes with substantial venture capital activity. These patterns were more pronounced in high-technology industries.” (Lerner, 1999, p. 315).

According to evaluations of later public VC programmes as well, it is clear that the VC sector is attracted to growth regions. For example, the Scottish Co-investment Fund is criticised for having failed to achieve a geographic spread in its investments (Hayton et al., 2008). A conclusion that becomes eminently clear in the studies of the subject is that the design of public VC systems must consider regional capacity to actually build a VC industry.

Nightingale et al. (2009) take this problem one step further by linking it to debate on the existence of a finance gap. Is the reason why the publicly supported European VC markets underperform (compared with the USA and other investment classes) simply that the financial and entrepreneurial clusters required for the proper functioning of the market are absent or too small? The conclusion drawn by Nightingale et al. (2009) for the UK is that the market is too small to generate a self-sufficient private VC market.

“Together these findings suggest that rather than only a finance-gap problem that can be solved by simply filling the gap with public money, or only a demand side problem caused by poor quality firms, the UK suffers from a ‘thin market’ in the provision of specialized venture capital funding and managerial expertise. ‘Thin markets’ occur when small numbers of high potential firms and small numbers of investors with the skills to help them grow find it difficult to find one another without incurring unacceptable transaction and/or search costs. As a result, firms complain about difficulties in getting funding while investors bemoan the difficulties in finding attractive portfolio firms. In a thin market both entrepreneurs and investors are telling the truth. Because thin markets make it difficult for the supply and demand for finance to match they reduce overall levels of investment.” (Nightingale et al., 2009, p. 21).

3.3.2 Agency theory and information symmetry

“Agency theory” and “information asymmetry” are theoretical concepts both of which are closely interlinked and common theoretical premises of VC research. Fully covering these theories would require a separate report – however, I shall briefly introduce the concepts

and explain how they relate to venture capital in general and how they can be related to public sector support of and participation in the VC market.⁴⁶

Agency theory is used to explain the (agency) problems that arise when the company's owner (the principal) is separated from its management (the agent). Because of these agent problems, costs arise, since the principal's and agent's interests do not always coincide (as both try to maximise their own utility).

In VC contexts, this relationship is usually presumed to exist between the VC investor (the principal) and the entrepreneur (the agent). The entrepreneur is to perform tasks on assignment by the investor. Nor is it by any means too bold an assumption that an investor's interests and goals may not always coincide with those of the entrepreneur. In venture capital, however, these relationships are not so simple and clear. In a normal VC relationship, the VC company is usually a minority owner and the entrepreneur a majority owner. The separation of management and owner is therefore not as complete as agency theory often presumes it to be. The relationship between VC company and entrepreneur is more about a mutual relationship (partnership and trust) than about someone acting on assignment from someone else. "Procedural justice" theory is an example of a theory that has been used to overcome the simplifications of agency theory, by taking account of the trust aspects of the relationship (Sapienza and Korsgaard, 1996).

Despite agency theory's shortcomings, it has nevertheless been the dominant theory for explaining the relationship between investors and entrepreneurs.⁴⁷

What more than anything makes agency theory applicable to venture capital is the theory's underlying assumption of information asymmetry.

"The financing constraints experienced by small firms arise from imperfections in capital markets which are conventionally attributed to the existence of information asymmetries." (Mason, 2009, p. 2).

In simple terms, information asymmetry arises when one party in a relationship has more information than another party about a particular situation (which is a logical result of an agent-principal relationship). The greater the difference, the greater the information asymmetry.

Venture capital companies operate in an environment in which information asymmetry is particularly prominent. Growth companies in their earlier stages have no stable history (track record) by definition, and the value of the company must be based on an assumption of what it is hoped that the company will achieve at some point in the future. One might even go so far as to state that the market's information asymmetry justifies the existence of the VC industry, and it is the ability to handle information asymmetry that distinguishes good from poor investors (Amit et al., 1998).

Information asymmetry can be characterised as having two forms: hidden information and hidden measures/steps. An example of hidden information would be a situation in which the entrepreneur has more knowledge and information about his or her business concept or product than does the party planning to invest in the company. An example of hidden

⁴⁶ For a more detailed presentation of agency theory, I would recommend, for example, Eisenhardt's (1989) extensive review or Jensen and Meckling's "original article" (1976). For a presentation of information asymmetry, Akerlof's (1970) Nobel prize-winning analysis of markets with asymmetrical information would be a good start, while Amit et al. (1998) provide examples of its application to venture capital.

⁴⁷ Some classic works include Admati & Pfleiderer (1994); Fiet (1995); Gompers (1995) and Yuk-Shee (1983).

measures would be that the investor cannot always observe whether the entrepreneur is really operating according to plan and making wise decisions. These two forms of information asymmetry lead to two potential problems: Hidden information creates a risk of *adverse selection*, while hidden measures/programmes create a risk of *moral hazard*.

In VC contexts, the risk of adverse selection can be seen primarily as a problem that arises in connection with investment decisions. Adverse selection simply implies that, if the VC company does not succeed in handling information asymmetry, eventually a market will arise in which only the worst, or the most overvalued, projects will be implemented.

The risk of moral hazard, then, is mainly a problem that arises after the investment occasion. How do you ensure that, after the investment occasion, the entrepreneur will not prioritise his or her own goals ahead of the shared goals?

Consequently, handling information asymmetry (or the risk of adverse selection and moral hazard) is a core issue for the VC companies.

The methods used to manage these risks are, primarily (Smith and Kiholm Smith, 2003):

- signalling (e.g., the board's track record)
- screening (e.g., thorough due diligence)
- bonding (e.g., with incentive systems)
- stepwise financing (linked to milestones)
- governance

It should be pointed out here that the methods for minimising information asymmetries are joint efforts. The entrepreneur must signal the company's quality (e.g., through including extensive information in the business plan) and the investor must possess the expertise necessary to screen and analyse that information.

The significance of agency theory and information asymmetry for public sector support for and participation in the VC market.

Both agency theory and asymmetric information theory are relevant and applicable when discussing the public sector role in stimulating the VC market. An example can be seen in Hayton's (2008) evaluation of the Scottish Co-Investment Fund.

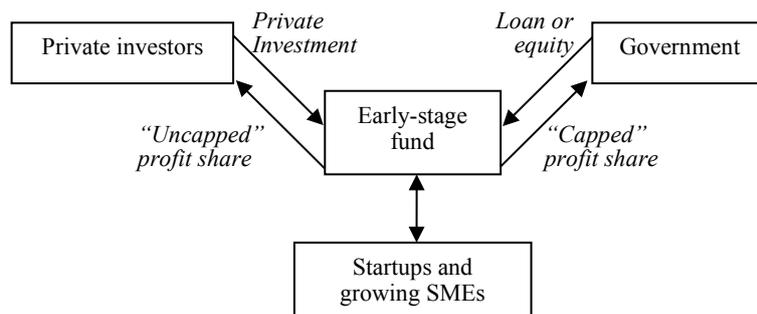
“There are also information asymmetries in that potential investors are not aware of available investment opportunities and the potential gains that can be made. On the demand side it may be that investees are unaware of the opportunities to obtain equity support. It may therefore be that there is less of an 'equity gap' and more of an 'information gap'.”(Hayton, 2008, p. 6).

A general problem that the public sector tries to handle is stimulating the VC market to act (invest) in earlier phases than it would without public-sector action. One way of doing this is to reduce, in various ways, the costs associated with handling information asymmetry. The actions that, for example, Almi (a Swedish governmental organization) make to help companies develop their business plans can be seen as “signaling support”. Training of business angels can be seen as a way of increasing the screening expertise of potential players in the informal VC market. Publicly financed meeting places are also actions that facilitate investors' screening processes.

The agency theory argument can also be expanded to include agency–principal relationships on several levels. While the VC company can be considered the principal – relative to the entrepreneur as agent – it can also be considered an agent – relative to its fund providers. In the case of the government acting as an investor, the agent problem arises between the government and the VC company. Consequently, this relationship, too, implies information asymmetry involving the risk of both adverse selection and moral hazard.

Jääskeläinen, Maulaa, and Murray’s (2007) examination of profit-sharing systems in public co-investment projects exemplifies an analysis of the agent–principal relationship between the government and private investors. Since it is difficult to compare the effects of existing structures due to their idiosyncratic character of individual programmes and their context, they designed a simulation model of a typical investment process carried out by a typical VC fund investing in early stages (see Figure 8 below).

Figure 8: A generic model of an “equity enhancement programme”



Source: Jääskeläinen et al. (2007), p. 4.

The model is then used to study the effects of profit-sharing and compensation structures in hybrid funds in which the government co-invests, in various ways, with private investors. In the simplest, most common models, there is no asymmetric profit-sharing between the public sector and the private investor (i.e., they invest on the same terms). However, it is possible to conceive of several models that include, in various ways, on profit-sharing, investment timing, loss guarantees or who undertake to pay the fund's operating costs. Jääskeläinen et al. (2007) first identify four common models used to manage risk and profit-sharing in hybrid funds.

1. *Differentiation of the investment timing.* Public investors invest earlier than private investors, which implies that private investors' return (i.e., internal rate of return – IRR) increases as the investment horizon shrinks.
2. *Lever with a government loan part.* The public contribution occurs wholly or partly in the form of a loan, which increases the return to the private investors as long as the return on the fund exceeds the cost of the loan.
3. *Differentiated return.* The public investors' return is limited, which benefits the private investors.

4. *Loss guarantees.* The public investors give the private investors a loss guarantee, that is, “downside protection”, which usually amounts to not more than 75 per cent of any loss. One problem with such a system is that it protects against poor decisions and thus increases the risk of moral hazard. In other words, the investors can make overly risky decisions, as the cost of failure is offset by government funds.

After identifying these four compensation structures, Jääskeläinen et al. (2007) simulate their effects regarding what generates the best return for private investors, thereby also creating the best incentives for private investors to participate (co-invest) in such programmes. Briefly stated, the results indicate that the optimal compensation structure is the one in which the investment timing is differentiated.

“In our stochastic simulation, we have used models based on existing profit distribution and compensation structures currently employed by governments. We find that, of the examined distribution structures, asymmetrically timed public and private investments offer the highest increase in the returns for the private LP after the direct costs of the compensation of the GP are subtracted. It therefore provides the most effective mechanism to skew the distribution of profits and thereby to create greater incentives for private investors to participate. Both of the structures, where public participation comes in the form of a loan or the returns of the public investor are capped, offer smaller increases in the returns for the LP. However, as their effect is most marked at higher performance levels, these profit distribution structures paradoxically only work in an environment where the need for asymmetric distribution is less pressing. The guarantee structure fails to increase the incentives to participate from the standard structure. (Jääskeläinen et al., 2007, p. 14).

3.3.3 System for government intervention

According to Maula and Murray (2003), government actions to promote the growth of “new technology-based firms” (NTBFs) usually focus on the following five areas:

- financial limitations
- leadership shortcomings
- market imperfections
- access to technologies
- access to information

In addition, policy actions can also be classified based on the manner in which they are delivered – either directly or indirectly, through similar forms of agents.

This report focuses entirely on actions that tackle the problem of financial limitations, or the “finance gap”.

The existence of the finance gap is an almost universally accepted assumption. Mention should be made here of the study by Sweco Eurofutures AB⁴⁸, on commission from Nutek and Almi (Sweco Eurofutures, 2008), that investigated the existing supply structure and the need for supplementary capital supply. The general picture conveyed by the report was that there is a gap between the seed phase and the next phase. In the latter phase the commercial capital really comes into play. A need for supplementary public equity capital

⁴⁸ A Swedish consulting firm.

(risk capital) appeared in the context of this finance gap. This finance gap (which, when one is talking about proprietor's capital, would be better termed "risk capital gap") was estimated as somewhere in the interval of SEK 1 million–2 million (c. 103,000–205,000 euro) up to SEK 10 million–20 million (c. 1 million–2.1million euro). Certain regional differences also appeared, for example, difficulties obtaining bank loans in the interior of the country and in small communities due to the low second-hand value of properties and industrial facilities. In these areas, there is a need for loan guarantees or supplementary loans with limited collateral.⁴⁹

In the start-up phase – between seed and growth – there is a great need for supplementary proprietor's capital. There is consensus in the region affirming the existence of a finance gap, that is, a need for from SEK 1–2 million to SEK 10 million in external financing. It is felt there is a need for more sustainable/long term capital that allows the company to develop its idea/product and covers the costs up to a potential broad market introduction. Public players such as Almi, Innovationsbron and Norrlandsfonden, in cooperation with SamInvest, business angels and other local risk capital companies, do not suffice. (Translation, Sweco Eurofutures, 2008, p. 5)

How then can the public sector handle the problem of the perceived risk capital gap?

In general, the government has the option of using either direct or indirect policies to handle problems of a perceived risk capital gap. With a direct strategy, the government is directly involved in the market as an active player, for example, by establishing a government-controlled and operated VC fund. With an indirect strategy, the focus is on political decisions that, in various ways, improve the conditions for a VC model. Examples of indirect risk capital strategies could be tax relief measures for risk capital investments or changes to regulations for institutional investors.

The Swedish government has a lengthy tradition of employing direct strategies. In the 1980s, for example, a large number of regional, government-managed risk capital funds were created. The "Industrial Fund", the "Norrland Fund", the "Development Funds" (which later became "Almi"), "Atle" and "Bure" are all examples of how the government tried different ways of using direct market actions to increase the supply of high-risk capital. In the second half of the 1990s, an increasing number of attempts with indirect measures were made, i.e., the introduction of a risk capital deduction, support for exchanges and listing processes, and changes in the regulations for pension funds.

A plethora of political experiments have taken place in Sweden, and worldwide, to bridge the perceived capital gap for growth companies in early stages. One way of conceptualising the various policy risk capital strategies could be to clarify, on the one hand, whether the strategies focus on the supply or the demand side and, on the other hand, what part of the VC process the strategy aims to support.

An interesting input in this context is the result of the OECD initiative of 2003 (OECD, 2003) that analysed venture capital trends and government actions in ten countries (i.e., Canada, Denmark, Israel, Korea, Portugal, Norway, Spain, Sweden, the USA and the UK). The situation in Sweden (and in all countries) at this point was relatively tense, after the

⁴⁹ See also Glesbygdverket, 2006, "Småföretagandets villkor i gles- och landsbygder" [The National Rural Development Agency, "The Conditions Facing Small-scale Entrepreneurs in Rural Communities"], where, in particular, the low second-hand values of properties and industrial facilities are identified as impediments to companies' growth in rural communities.

bursting of the “IT bubble”. However, the analysis focused primarily on general actions conducted to promote both the demand and the supply sides of venture capital. Table 2, below, presents a compilation of observations and recommendations for Sweden.

Table 2: Development and recommendations for Sweden's VC policy, according to OECD (2003, p. 6)

Area	Recent/planned action	Recommendations
Investment regulations	Regulations on public pension funds and individual retirement savings modified to expand allowable investments in venture capital.	Remove quantitative restrictions on venture capital investments by institutional investors including private pension funds.
Tax incentives	Government is considering a proposal to exempt companies investing venture capital in other companies from capital gains taxes.	Consider lowering capital gains taxes and removing wealth taxes to stimulate investments by entrepreneurs and business angels.
Equity programmes	Industrifonden (the Swedish Industrial Development Fund) and NUTEK (the Swedish Business Development Agency) jointly operate a small seed funding programme.	Consolidate public equity programmes and focus on pump-priming private financing for start-ups.
Business angel networks	SwedBan, CapTec and the Nordic Venture Network are all working to link business angels with investment opportunities.	Ensure linkages between business angel networks and technology incubators as well as spin-offs from public research.
Second-tier stock markets	Nordic OTC created to provide common Nordic platform for unlisted companies.	Encourage creation of a single second-tier stock market at Nordic and/or European level.

As the above table shows, the OECD (2003) divided the analysis into five focus areas: general investment regulations, tax regulations, direct risk capital programmes, business-angel networks and stock markets.

Regarding Sweden's direct risk capital programme, the recommendation, as the table indicates, is for increased consolidation (coordination) of existing programmes and a focus on measures to stimulate private financing of early stages. Accordingly, the OECD views the risk capital actions as “pump-priming measures”, that is, temporary stimulus measures designed to spur on private players.

Strategies for supply-oriented influence

In this report, the focus is on political measures to influence the supply side. In this context, we can divide the strategies designed to increase the availability of risk capital for growth companies in early stages into *direct* or *indirect* strategies. With direct strategies, the government invests directly in companies, whereas indirect strategies are primarily designed to inspire private investors, through various measures, to invest. Regarding indirect measures, one approach might be to proceed from the assumption of an investor's goal of achieving the maximum return for every given level of risk. In other words, an indirect strategy could imply stimulating private investors, either by increasing the potential return or reducing the risk of loss. In the following discussion, four direct and indirect strategies are discussed in more detail.

1. Direct participation. Sweden has had a tradition of direct participation in the VC market ever since the arrival of “Svetab” and “Företagskapital” in the early 1970s. In modern times, it is mainly “Industrifonden” that has been a direct risk capital investor

in the Swedish VC market. Examples of direct participation can be observed in many countries, for example, France and Germany.

2. Tax credits are a way of stimulating access to risk capital by increasing the potential return. One of the best-known examples of such a system is the Canadian “Labour-sponsored venture capital funds”, in which investors can make a straight tax deduction corresponding to a certain size of the investment. A variant of this would be to offer tax relief on gains made on risk capital investments in young companies.
3. Government loans or loan guarantees to licensed (or in some other way approved) private VC funds that would subsequently invest in accordance with special guidelines. The American Small Business Investment Company programme (SBIC)⁵⁰ and Overseas Private Investment Corporation (OPIC)⁵¹ are examples of programmes that offer such support. Here, investors are given the opportunity to borrow up to two times their own investment, and since the interest cost of the loan is considerably lower than the expected return, these systems create a financial leverage effect on the private investors' expected return.
4. Co-investment funds, in which the government invests in private VC funds (often called “hybrid funds”). The fundamental principle is that the government contributes part of the capital and private players contribute the rest. (Ratios applied can range from 1:1 to 1:3.) The co-investment funds often, but not always, have some form of incentive structure in addition to the opportunity to scale up the size of the investments. For example, the government might limit its return to a fixed percentage (interest) and let any surplus over and above that level accrue to the private investors. In other words, these systems often create double leverage on both the investment and the return. A successful example of this type of co-investment structure is the Israeli Yozma fund scheme. The private investors in a Yozma fund had an option to buy out the government investment within five years for a nominal interest cost, which did in fact occur in eight out of ten Yozma funds.

3.4 Swedish government measures to stimulate the supply of risk capital

The Swedish government has played an active role in trying to stimulate a vital risk capital market in Sweden and address the capital gap in early stages. (Ds 1994:52, 1994; SOU 1981:95, 1981; SOU 1996:69). Government actions can also be seen as a lengthy period of attempts and failures and, from the evaluations made of the attempts, we can safely say there were quite a few failures. Regional risk capital companies created in the 1970s and 1980s were fairly expensive and unsuccessful undertakings (Riksdagens revisorer [Parliamentary Auditors], 1996). Tax incentives for risk capital investments (risk capital deductions) were tested and retracted (NUTEK, 1998). Supporting measures to new stock markets (exit stimulus measures) that were tested were fraught with difficulties and their effects were open to question (NUTEK, 1997; 2000).

Evan measures that have been considered successful may be questioned in retrospect. The “IT bubble” was caused largely by an over-supply of capital (Valliere and Peterson, 2004). One of the largest suppliers of capital in Sweden were actors belonging to the government (through investors such as the pension funds, the “Industrifonden” and the

⁵⁰ http://www.sba.gov/aboutsba/sbaprograms/inv/esf/inv_sbic_financing.html (2010-02-10)

⁵¹ <http://www.opic.gov/> (2010-02-10)

“Teknikbroarna” [“Technology bridge” foundations]. In other words, one might see how the (positive) measures undertaken to increase the supply of capital in the early 1990s contributed, toward the end of the decade, to an oversupply of capital that led to speculative, short-term investment behaviour around 1998–2001.

The Swedish government's role in the market has involved both direct measures (e.g., through government-controlled VC companies), including investments in small companies, and indirect measures aiming primarily to create a supportive environment for both the supply and demand sides of the risk capital market (e.g., through tax incentives).

The creation of various government institutions that invest in venture capital – particularly “Industrifonden”, the Pension Funds and “Teknikbroarna” – is probably the political measure that had the greatest direct impact on the development of the Swedish VC market.

The change in the regulations for the Sixth National Pension Fund (Prop. 1995/96:171) made it possible to allocate pension funds to the VC market. This decision led to the Sixth National Pension Fund becoming one of the largest investors in the Swedish VC market.

One initiative that focused more on the demand side was the creation of the “Teknikbro” foundations in 1994. These foundations also contributed actively as investors in the VC market (SOU 1996:69, 1996).

A system involving risk capital deductions that was introduced in Sweden in 1996 (Prop. 1995/96:109) was fairly short-lived. The risk capital deduction meant private investors could claim tax deductions on their investment. However, the system was encumbered by an abundance of rules and restrictions that made it inefficient, so it was phased out after only one year (NUTEK, 1998).

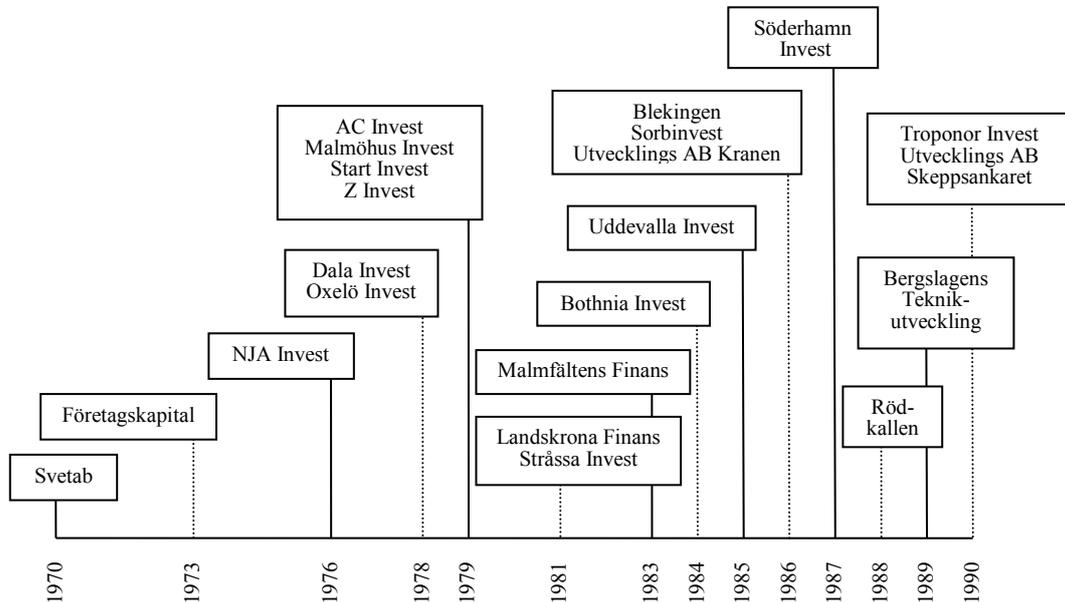
The creation of the Swedish OTC market in 1982, combined with deregulation of the financial sector in 1980, contributed to the initial development of the Swedish VC market. In the latter part of the 1990s, a system of financial support to promote trading in shares in small companies was also tested. Under this system, grants were allocated to defray listing costs. The stock markets were very volatile during this period, however, so the programme had limited success (NUTEK, 2000).

In the 1970s and 1980s, through local, regional or national actors, the government created about thirty VC companies. Figure 9 provides an overview of these companies, including the name of the company and the year it was formed.⁵² Several of these regional companies were then included in the evaluation carried out by the Riksdagens Revisorer [Parliamentary Auditors] in 1996, which is described in the next section.

“Företagskapital” is often seen as Sweden's first VC company, even though “Svetab” started a few years earlier. It was then mainly a question of definitions. (Svetab did not define itself as a VC company although it did behave as one.) Very few of these companies are currently active as VC companies; most have closed down, merged to form new entities or shifted their focus (often to privately owned industrial companies).

⁵² For a detailed description of the Swedish VC market's historical development, I refer the reader to my doctoral dissertation (Isaksson, 2006).

Figure 9: Government VC companies in Sweden in the 1970s and 1980s



The Parliamentary Auditors' [Riksdagens Revisorer] evaluation of six regional investment companies

In the late 1980s, the government became involved in launching six regional investment companies: Blekingen AB, Rödkallen AB, Sorbinvest AB, Troponor Invest AB, Utvecklings AB Skeppsankaret and Bergslagens Teknikutvecklings AB. These companies were established in regions hit by business closures and relatively high unemployment. The intention was to inject new high-risk capital into promising companies in these regions. In total, the government contributed SEK 187 million (c. 19.2 million euro) to these companies.

In the mid-1990s, these government risk capital actions were evaluated by the Riksdagens Revisorer [Parliamentary Auditors] (1996). The background to this evaluation was partly that sufficient time had elapsed that it was possible to carry out an evaluation, and partly that, in the early 1990s, the government had begun to divest several of the companies.

The lessons learned from this evaluation may be valuable for future undertakings.

The scenario revealed by the evaluation was not particularly favourable. Only a few companies had succeeded in investing in sustainable companies. At the time of the evaluation (1995), an estimated 400 to 500 people were employed in companies in which these six regional investment companies had invested (moreover, most of these people were employed by one and the same company). After divestments, the government recovered some of the funds invested in these operations. Even so, the Parliamentary Auditors estimated that the government's cost per employee amounted to nearly SEK 200 000 (c. 20,500 euro). A comparison made here is that a policy instrument provided for employment support within the government's regional policy at this time amounting to slightly more than SEK 170 000 (c. 17,500 euro).

What was then considered the reason for the poor result? The report reveals that the investment companies were often confronted with an impossible task, namely, taking prompt action to resolving a regional crisis by investing in companies that did not exist. There was clearly a conflict between hopes and realities. The problem had been described as early as 1983 by Olofsson (1983), in one of the first studies of Swedish government venture capital. Olofsson had noted that the pressure on regional government companies to engage themselves on commercial terms, on the one hand, while becoming associated with actors with a strong interest in direct employment-boosting undertakings, on the other, led to "*an ambivalence that was destructive to operations*" (Olofsson, 1983, p. 102).

The parliamentary auditors' evaluation also addresses the fact that, in too many cases, the senior management of the investment companies lacked substantial experience and expertise in various forms of management and board work in small companies.

Some of the conclusions highlighted by the Parliamentary Auditors were:

- The investment companies were equipped with too small a capital base, particularly considering that no new capital infusions could be expected.
- Regional risk capital dissemination is an uncertain operation. The risk of unprofitable investments is significant and, even when an investment is successful, the return is not realised until the shareholdings have been divested.
- The task of the investment companies to resolve regional risk capital problems was in reality broader than purely business economics. The conflict between these goals was reinforced by the fact that government control of the investment companies via the Articles of Association and other instruments was considered insufficient. "*On the one hand, the company was formed to handle tasks with which the market has been deemed unable to cope. On the other hand, it has been presumed that the companies would operate on market terms. Consequently, it has never been established whether these companies would operate on entirely commercial terms or whether, for example, employment considerations should take precedence*" (Riksdagens revisorer [Parliamentary Auditors], 1996, p. 22).
- A recurring problem that was noted was an inherent conflict between the short term and the long term. Several of the investment companies were formed to resolve relatively acute problems (e.g., after a business is shuttered), though it became apparent that it takes a long time to build up investment companies. Even when the investment companies were entirely operational, there were recurrent conflicts between having to produce (and demonstrate) results quickly and the need for long-term strategies. "*An eloquent example is that of "Bergslagens Teknikutveckling", which invested its entire capital in its first two years of operation. Due to losses in several of the invested companies, the company's entire capital was consumed and the operations cease approximately four years after the formation of the company*" (ibid, p. 3).

The evaluation concludes with the following advice:

The government should use existing organisations for risk capital financing rather than creating new ones when needs are considered to have arisen. There is much that would suggest that it is more productive to provide existing institutions with the best possible long-term work conditions and, where necessary, provide correctional impulses, than

to start all over from scratch. (Riksdagens Revisorer [Parliamentary Auditors], 1996, p. 40).

3.5 Current situation for international empirical research

The aim of this chapter is to compile and analyse the current situation of empirical research into government actions to promote risk capital investments in early stages. Underlying this aim is, of course, the hope of helping to avoid repeating old mistakes and passing on successful examples for the future.

Of course, it is next to impossible to draw direct parallels between specific policy actions in a certain country at a certain time and policy actions in another country at another time. All evaluations of various actions that have been carried out must be considered in light of the original purpose of the actions and the context in which they were implemented. At the same time, political decision-makers try to develop systems to support risk capital investments in companies' early stages.

Preparation of this chapter involved reviewing a large quantity of international empirical research focusing in various ways on systems of public sector intervention in the VC market. The review focused mainly on supply-influencing systems and models, that is, systems in which the government participated directly as an investor.

This section includes ten subsections in which I review fourteen government VC programmes in eight countries, that have been evaluated by thirteen evaluators (some of whom produced several reports). The basic approach was first to give a brief objective description of the background and design of each programme and then report on one or more of the programme evaluations. The evaluations are frequently very extensive, and it is impossible to go through each one in detail. I have endeavoured to focus on generally important conclusions from the evaluations (e.g., whether the programme provides additionality or has led to crowding out). Moreover, in certain other cases I have highlighted methodological aspects of the evaluations that I believe could contribute valuable lessons for the future. Generally, I have considered the learning aspect most important to focus from the evaluations.

Nor are the reviews distributed proportionally. Certain programmes are dealt with very briefly, whereas others are discussed in great detail. The criterion has been to emphasise and underline programmes that I believe might be of general or special relevance to future political decisions and actions. One of the programmes highlighted is the Scottish Co-investment Fund. While it is relatively new, the programme was the model for Swedish actions in the field. Moreover, there are two parallel evaluations of it to be studied. Another programme that was given a little extra space is the Israeli Yozma programme, mainly because it is a system often cited as a good example. The programmes and evaluations dealt with in this report are summarised in Table 3.

Table 3: Summary of VC programmes and evaluations

Year	Programme	Country	Evaluation by
1999	SBIR and SBIC	USA	Lerner (1999) and Rossman et al. (2008)
2003	Finlands Industriinvestering AB	Finland	Maula and Murray (2003)
2004	Labour-sponsored venture capital funds	Canada	Ayayi (2004) and Cumming and MacIntosh (2003)
2005	New Zealand Venture Investment Fund (NZVIF)	New Zealand	Lerner et al. (2005)
2009	Enterprise Capital Funds, Early Growth Funds, Regional Venture Capital Funds, Scottish Enterprise-backed Funds, University Challenge Funds and Welsh Hybrid Funds	UK	Nightingale et al. (2009)
2009	The Scottish Co-investment Fund	Scotland	CSES (2007) and Hayton et al. (2008)
2007	Innovation Investment Fund	Australia	Cumming (2007) and Lerner and Watson (2008)
2004	Yozma Venture Fund, Inbal	Israel	Avnimelech (2009) and Avnimelech and Teubal (2004b)

3.5.1 Small Business Innovation Research (SBIR) – USA

Background and design

The SBIR programme is a federal programme, established in 1982, that channels R&D grants to promote the proliferation of new companies. The programme encompasses many actions, such as micro loans and loan guarantees. Ten federal agencies allocate a portion of their R&D budget every year to finance research proposals from hi-tech companies with close links to research. Since 1994, there has also been a coinvestment programme (hybrid funds). The SBIR programme is generally considered to have had major significance in the advance of the American VC market (Gompers and Lerner, 2001; Noone and Rubel, 1979).

Evaluations by Lerner (1999) and Rossman et al. (2008)

Lerner's (1999) evaluation of the SBIR programme in the USA is one of the earliest and most cited evaluations of government VC programmes. At the time of Lerner's evaluation, the programme had contributed over USD 7 billion to small hi-tech companies during the 1983–1997 period. Lerner's conclusion from the evaluation was that the companies that had received support from SBIR had significantly higher growth rates than did corresponding non-supported companies. However, Lerner also saw major differences between the companies. Significant differences could be seen between industries, with companies in hi-tech industries being prominent. Moreover, the effect of the actions was greatest in regions that already had a strong venture capital community.

Rossman et al. (2008) evaluated the Debenture Small Business Investment Company (SBIC), a programme providing loan guarantees to “approved” VC companies (SBICs). Instead of working directly with small companies, a loan system is used, whereby private VC companies can obtain leverage on their capital.

The analysis by Rossman et al. (2008) achieves essentially the same result as Lerner's, namely, that companies that receive financing through this system generally grow faster and more than do other comparable companies. Rossman also identifies a certain regional imbalance, but takes the analysis one step further than does Lerner (1999), by comparing investments in various regions and industries with comparable private VC investments. The results of the comparison indicate that there is significantly more imbalance in the distribution of private risk capital than of capital distributed through SBICs (see Table 4). Within the private VC sector of the comparison, 42 per cent of all investments (46 per cent of the capital) were made in California, followed by Massachusetts, where 13 per cent of all private investments ended up. The largest concentration of SBIC investments was made in New York, which received 19 per cent of all SBIC investments (31 per cent of the value). California was the area that received the next most investments from SBIC, 11 per cent of the total and 9 per cent of the value.

“This finding suggests that firms that receive SBIC's investments are less geographically concentrated than those that receive investments from private venture capital firms” (Rossman et al., 2008, p. 44).

Table 4: Comparison of the geographic spread (share of invested capital) between SBIC VC and private VC

SBIC VC		Comparable private VC	
<i>State</i>	<i>% of \$ volume</i>	<i>State</i>	<i>% of \$ volume</i>
New York	18.66	California	45.8
California	11.06	Massachusetts	12.91
Texas	8.81	Texas	5.91
Illinois	5.95	New York	4.01
Massachusetts	3.62	Washington	3.14
Remaining states	51.9	Remaining states	28.23

Source: Rossman et al. (2008), p. 47

A lesson from Lerner (1999) and Rossman et al. (2008) is that government VC programmes must be adapted to the actual regional circumstances. However, it is possible to create, through regulations and incentive structures, a more even regional distribution of public finance provisions than what the private sector can manage.

3.5.2 Finlands Industriinvestering AB

Background and design

Finlands Industriinvestering AB (FII) is a wholly (100 per cent) government-owned investment company that commenced operations in 1995. The primary aim of FII is to improve the conditions for SMEs in Finland by making risk capital investments in VC companies (i.e., VC funds). The government's guidelines noted particularly that the government saw a market failure in companies' access to risk capital in early stages (i.e., the seed and start-up stages) that it hoped that FII could mitigate.

Evaluation by Maula and Murray (2003)

Maula and Murray (2003) evaluated FII. The analysis covered FII's operations from 1995 to 2001. By the end of 2001, the Finnish government had invested close to EUR 230 million in FII. In all years except the last (2001), FII succeeded in generating positive results. In 2000, FII had its best earnings – EUR 26.9 million – and 2001 was the company's only year of loss, a year in which it generated a loss of EUR 0.9 million. According to Maula and Murray, during the period, FII exerted a significant influence on the development of the Finnish VC market, which can be illustrated by the fact that by the end of 2001, FII had invested in almost half of all active VC funds in Finland. In addition to the indirect investments (via VC funds), FII had also made a small number of direct investments in companies. The government guidelines that FII applied stressed that investments should primarily be made indirectly via funds and only in exceptional cases (e.g., when an extremely long-term risk-taking was required) could it invest directly in companies.

So Maula and Murray's (2003) evaluation of FII revealed an FII that was relatively successful from 1996 to 2000. FII clearly contributed to the development of the Finnish VC market and to the development of regional VC funds. In 2000, however, the government guidelines for FII changed, resulting in a stronger focus on profitability and market terms. No doubt the general global situation was part of the motivation for these changed guidelines. When soon after this point the market plunged (after the IT bubble), the profitability requirements created a serious barrier to FII's ability to fulfil its mandate to invest in early-stage enterprises, according to Maula and Murray. The profitability requirement “forced” FII to source investments at later stages than had originally been planned. More than anything, Maula and Murray saw how the combination of profitability requirements and the objective of FII operating its investments on the same terms as private investors reduced FII's ability to handle the market failure it was created to deal with. Maula and Murray highlight very clearly the difficulty in handling a market failure on market terms.

Another detail pointed out by Maula and Murray (2003) was how the profitability requirement created an unfortunate tendency at FII to apply a short-term perspective. The profitability requirements imposed on FII was not extreme, just to ensure that the organisation would generate a surplus higher than inflation. However, one problem with this requirement, highlighted by Maula and Murray, was that such a static profitability goal was adapted to neither normal market fluctuations nor to the J-shaped development pattern usually exhibited by VC funds. What Maula and Murray called for was more long-term profitability goals that could provide “*the managerial freedom to take risks and to invest counter-cyclically*” (Maula and Murray, 2003, p. 125).

3.5.3 Labour Sponsored Venture Capital Funds (Canada)

Background and design

To stimulate investment in SMEs, Canada established a system of tax relief for investment in labour union-supported Labour-Sponsored Venture Capital Funds (LSVCF).⁵³ The size of the tax credits has varied over time and between provinces, but has usually been in the 15–35 per cent interval. Tax relief provisions are usually reserved for individuals and

⁵³ Other designations in use include “Labour-Sponsored Investment Fund” (LSIF) and the more politically neutral “Retail Venture Capital”.

involve relatively small amounts (max. CAD 5,000 per year). Moreover, there is a requirement that the capital remain tied up for eight years to obtain the tax reduction. These funds are, as their name implies, labour union supported, implying that they are administered and partly owned by a labour union. The actual management (investment decisions, etc.) is normally outsourced, however, to private players. The tax relief provisions have made LSVCFs one of the most significant players in the Canadian VC market.

LSVCFs are subject to a number of prescribed restrictions:

- LSVCFs must invest within a geographically limited area
- Investors in LSVCFs must accept an eight-year lock-in period for their capital
- The number of funds is restricted in certain regions
- Penalties are incurred for not reinvesting a fixed amount of the capital infused within a certain period
- Requirements stipulate the size and type of investment for every given company

Evaluation by Ayayi (2004) and Cumming and MacIntosh (2003, 2006)

Ayayi (2004) analysed how government subsidisation has affected the Canadian VC market and the Canadian economy. One of his main conclusions is that the tax reduction made LSVCFs so irresistible to investors that they received more capital than they were able to invest (due partly to restrictive regulations).

In his analysis, Ayayi (2004) compared the returns on LSVCFs with the returns on a number of comparable bond and stock market indexes (such as the Canadian Small Cap Index). He shows that, with few exceptions relating to duration, LSVCFs systematically underperformed these comparison indexes, despite the fact that LSVCFs take higher risks and charge a significantly higher management fee than do the comparison funds. Ayayi sees the fact that LSVCFs succeed in attracting investors despite their poor results as an effect of the tax subsidy:

“Financial returns are not the ultimate goals of the LSVCF investors, because if this were the case, no investor would continue to funnel money into a fund that systematically underperformed the major indexes. As a result, this study infers that the tax incentives are the foremost reason that draws LSVCF investors” (Ayayi, 2004, p. 341).

Another problem with LSVCFs that Ayayi highlights is that their management generally lacks investment experience:

“The Canadian LSVCFs are populated by a large number of inexperienced, and perhaps many unproven, managers who probably have made questionable investment decisions that partially are responsible for the languishing performance of their LSVCFs” (Ayayi, 2004, p. 342).

Ayayi gathered support for these rather provocative conclusions by analysing a large number of investor prospectuses from LSVCFs. He also makes connections to some American studies (such as Gompers, 1994; Bygrave and Timmons, 1992) that have demonstrated how an excessive inflow of capital (from investors) reduces both fund expertise and fund returns on the VC market.

Despite all the negative criticism of LSVCFs, Ayayi also stresses that LSVCFs have had a favourable effect on capital supply opportunities for Canada's many SMEs, while the tax subsidies do have unfavourable side-effects: “*The tax incentives are like little bribes that make LSVCFs irresistible to investors and flood the LSVCFs with more money than they may be able to invest wisely*” (Ayayi, 2004, p. 344).

Cumming and MacIntosh (2003, 2006) also analyse the effects of LSVCFs, focusing particularly on the risk of crowding out effects. They also analyse LSVCF profitability and arrive at the same conclusion as does Ayayi, namely, that the labour-supported venture capital funds have consistently underperformed other investment forms. Cumming and MacIntosh begin by showing how the Canadian VC market has grown, seemingly due to the introduction of LSVCFs. They then proceed to design an equation to estimate the supply of and demand for VC in Canada from 1977 to 2001. Variables used in this equation include GNP growth, stock market returns, real interest rates, start-ups, etc., as well as the introduction of LSVCFs.

Contrary to what was previously assumed, Cumming and MacIntosh (2003, 2006) find extremely strong support for the notion that the LSVCFs have had a significant crowding out effect on other forms of VC funds. They estimate that, due to the introduction of LSVCFs, there have been 400 fewer investments a year (corresponding to CAD 1 billion) than would have occurred had the programme not existed. Hence, Cumming and MacIntosh find support for the idea that the LSVCF programme has had an effect directly opposite to that sought, and at a significant cost to the state. Cumming and MacIntosh estimate that during the studied period, the programme cost the Canadian government somewhere between CAD 3 and 4 billion. Consequently, the analysis by Cumming and MacIntosh leads to the conclusion that the Canadian government has paid a huge amount of money to achieve a reduction in VC investment in Canada.

3.5.4 Enterprise Capital Funds (ECFs), etc.

Background and design

Nightingale et al. (2009) analysed the effect of six government VC programmes in the UK. During the 1995–2008 period, these programmes financed 782 companies. The six programmes are: Enterprise Capital Funds (ECFs), Early Growth Funds (EGFs), Regional Venture Capital Funds (RVCFs), Scottish Enterprise-backed Funds, University Challenge Funds (UCF) and Welsh Hybrid Funds.

The majority of these programmes are 'hybrid funds', which means the government risk capital is channelled via private players.

Evaluation by Nightingale et al. (2009)

Generally, these programmes have had a favourable effect on company growth (compared with a matched control group). In particular, it is possible to observe positive growth in the number of employees in the years directly following the initial investment. However, the six programmes had a marginal effect on company profitability. Altogether, Nightingale et al. (2009) find a total effect they consider relatively marginal:

“Such findings are not compatible with the view that the simple provision of equity funding will generate US-style VC performance. Nor it is compatible with the view that there is (was) a large untapped source of high-potential firms in the UK that are only

constrained from growing by a lack of funds at the levels funded by the schemes.”
(Nightingale et al., 2009, p. 16)

Nightingale et al. (2009) analysed the result of the evaluation from both a supply and a demand perspective. From a demand perspective, the results could be interpreted as indicating that the UK lacks a sufficient number of companies with growth potential that is limited by a shortage of capital.

A primary contention advanced by the authors in their analysis is that the problem is one of thin markets, rather than primarily one of supply or demand for risk capital. A thin market is a market in which there are a limited number of investors and entrepreneurs, making it difficult for both sides to find and enter into agreements with each other at reasonable cost. A thick market is required to achieve a vital and successful risk capital market. Thick markets are characterised by high levels of repeated interaction between risk capital (VC) and companies with high growth potential. In a thick market, there is room to create an: *“ecosystem of high-quality advisors to develop specialising in supporting early-stage VC investment”* (Nightingale et al., 2009, p. 5).

Nightingale et al. (2009) claim that the UK lacks a sufficient number of large VC investors that focus on early stages; they also consider that the hybrid funds created under the programmes are too small to support the commercial risks associated with investing in early stages and to efficiently implement follow-up investments. Earlier studies (Murray, 1999; Murray and Marriott, 1998) support the idea that a VC fund should have a capital base of at least GBP 50 million.

3.5.5 The Scottish Co-investment Fund

Background and design

The Scottish Co-investment Fund (SCF) was established in 2003 by Scottish Enterprise, with GBP 48 million in capital and part financing from the European Regional Development Fund (ERDF).

The fund's mission is to collaborate with the private sector to enhance the risk capital market's capacity and ability to increase the supply of risk capital for early stages.

The fund recruits formal VC and informal risk capitalists (e.g., via business angel networks) as partners and coinvests up to a maximum of GBP 500,000.

What distinguishes the SCF from many other public investment programmes is that the fund follows private (lead) investors. This means the fund itself does not conduct any due diligence on its investment objects as long as the objects (the companies) are within the general investment criteria stipulated by Scottish Enterprise.

According to Centre for Strategy & Evaluation Services CSES (2007), between April 2003 and December 2006 the SCF implemented 162 investments totalling GBP 22.95 million in one hundred companies. Translated to an average exchange rate for the period (13,4 SEK/GBP), the SCF investments correspond to an approximate total of almost SEK 308 million, and the total investment per company is slightly over SEK 3 million.

At the time of the CSES (2007) evaluation, no exits had occurred. At the time of the evaluation by Hayton et al. (2008), one exit had been conducted.

Evaluation by CSES (2007) and Hayton et al. (2008)

The SCF is evaluated by two reports separated by a relatively short interval. One evaluation was done by the Centre for Strategy and Evaluation Services for the Scottish Government Social Research (CSES, 2007). The study is based on data collected mainly in 2006. The other evaluation was done by Hayton et al. for Scottish Enterprise (Hayton et al., 2008) and it is based on data collected in 2007.

The evaluation by Hayton et al. (2008) was carried out in a shorter period and is based mainly on secondary data (e.g. fund reports) and interviews with fund partners, portfolio companies and various stakeholders (mainly policymakers). The CSES (2007) evaluation includes all public VC and loan funds (called VCLF instruments) supported by the ERDF in Scotland. The SCF is thus one of several (nine in total) funds evaluated by CSES (2007). Methodologically, CSES (2007) is significantly broader. Apart from interviews (like those in Hayton et al., 2008), this team also used financial data from portfolio companies and funds and distributed a questionnaire to all portfolio companies.

The CSES evaluation included a total of four risk capital funds, of which the SCF was the most prominent (see Table 5, below).

Table 5: Scottish public risk capital funds evaluated by CSES (2007)

Fund	Orientation and scope
<i>The Scottish Co-investment Fund</i>	"The objective is to increase the amount of equity-based risk finance available to growing SMEs in Scotland to enable them to realise their full potential, while improving the business building skills of early stage companies and their support network".
<i>Sigma Innovation</i>	Focuses on innovative companies with high growth potential in early stages (though not seed or earlier). Total managed capital of GBP 6 million. Eleven investments made, totalling GBP 3.5 million.
<i>Sigma Sustainable Energy</i>	Like Sigma Innovation, but with a focus on companies in renewable energy (cleantech). GBP 6 million in managed capital; at the time of the evaluation, only one investment, of GBP 0.5 million, had been made. The fund's aim is 16 investments of a maximum of GBP 0.5 million per investment.
<i>Genomia</i>	Specialises in spin-offs from universities and the public sector, in animal health and life science. Total managed capital: GBP 1 million. At the time of the evaluation, only one investment, of GBP 168,000, had been made.

The evaluations by CSES (2007) and Hayton et al. (2007) complement each other and were also conducted at almost the same time. Therefore, I have chosen to combine them and highlight what in my view are their most important observations.

Overall conclusions

Both CSES (2007) and Hayton et al. (2008) contend that the SCF's co-financing model did help to develop the local finance market. Above all, the business angel networks were in favour of the opportunities the SCF gave them to scale up the size of their investments.

The publicly supported market for VC and loan capital constitutes a relatively small part of the total Scottish market for SMEs investment. Despite this, it is significant, particularly for companies in early stages and in high-tech fields.

Reasons for intervention

The fund was created on the basis of an assumed supply problem. It was assumed that in Scotland there were many sound, healthy, companies with high growth potential that, due to a shortage of capital, were unable to realise their full growth potential.

Based on the interviews conducted, Hayton et al. (2008) conclude that the problems in the region are both supply and demand problems. The demand-side problem is mainly that the companies lack “investment readiness”. The supply-side problem is mainly a question of attitudes to risk. The conclusion, however, is that attitudes to risk are more a proof of market rationality than of market failure.

“Indeed we argue that the market failure rationale for the Fund is poorly articulated in that what is cited as evidence of market failures is best seen as problems, some of which may be evidence of market rationality. However, in this the Fund is no different to many other European and British public equity actions many of which, if not all, fail to provide definitive evidence of market failure.” (Hayton et al., 2008, p. 6)

In their analysis, Hayton et al. (2008) come up with three potential arguments, that they find lacking in their examination of the SCF.

- Market rationality results in the private market investing in sectors with lower risk and higher expected returns. This leads to investments in young companies with growth potential being at a disadvantage, which will eventually reduce the new company base. Action by the public sector can therefore be justified by long-term economic efficiency.
- There are information asymmetries in the market, in that private investors are unaware of the available investment opportunities and the profits that stand to be made. From the demand side, this can be seen as companies being unconscious of the available opportunities to obtain risk capital. The problem then becomes less one of a finance gap and more one of an information gap.
- A third argument for market action could be made from the perspective of national and international competition: to avoid falling behind other regions in terms of new entrepreneurial activity, etc.

In sum, they find arguments supporting action by the public sector, particularly through the funds' catalytic effect on business angel syndicates.

Types of investments and partners

The regional distribution of SCF's investments is skewed, with overrepresentation in eastern Scotland and underrepresentation in the other regions of the country. The rate of investment is estimated as under the projected rate – that is, the fund has not found as many investment objects as was expected.

In terms of industries, the SCF's investments have favoured biotechnology, electronics and IT (see Table 6). The industry distribution is quite different from the distribution found among the loan finance providers, which indicates that it is a different type of company that seeks risk capital finance providers.

Table 6: SCF investments by industry

Industry	Amount, GBP 000s	Proportion, %
Biotech/medical devices	15,376	25
Creative industries/media	4,548	8
E-business	4,322	7
Electronics	11,735	19
IT hardware/software	10,043	17
Manufacturing	1,879	3
Oil and gas	3,053	5
Other	9,967	16

Source: CSES (2007)

The positive effects that Hayton et al. (2008) saw were primarily co-investments with groups of informal investors who were thus able to scale up their investments. Business angels and business angel syndicates account for 82 per cent of the number of investments carried out with assistance from the fund (see Table 7).

Table 7: Partners of the Scottish Co-investment Funds (December 2007)

Type of partner	Number of partners	Number of investments	% of total
Banks	1	3	1
Venture capital	5	30	12
Industrial companies	5	11	4
Business angels and BA syndicates	15	201	82
TOTAL	26	245	100

Source: Hayton et al. (2008)

The average investment with a business angel as a partner was GBP 103,873, which can be compared with GBP 175,526 for investments with a VC company as a partner. In terms of total invested amount, investments with a VC company as a partner accounted for 19 per cent of the invested amount and with business angel syndicates for 74 per cent.

Despite the fact that the average investment is well under the maximum investment amount, the authors still conclude that the investment restriction (GBP 500,000) is too small. They suggest that this amount be doubled.

Profitability and effect

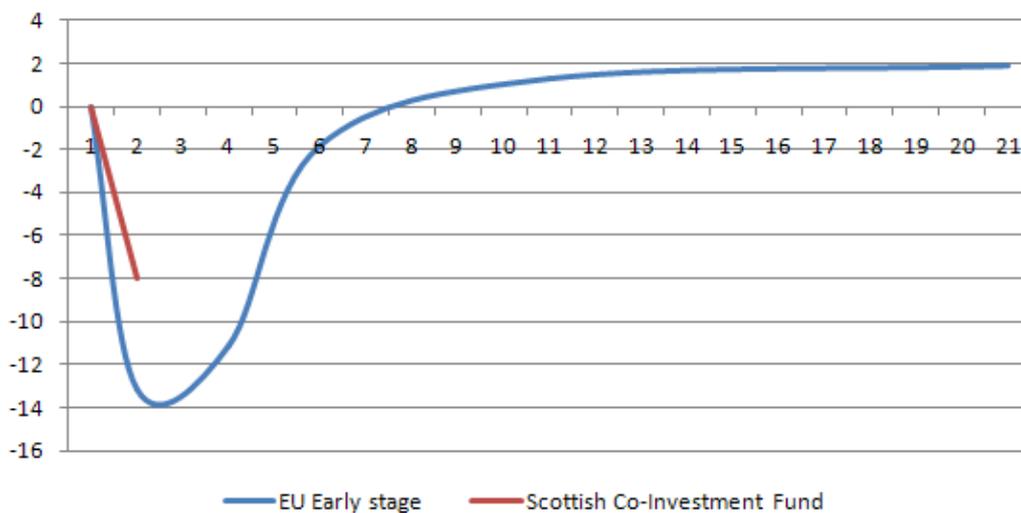
All investments are made at relatively early stages in the companies' life cycle, and no exits have been carried out yet. Therefore, CSES has had no direct opportunity to estimate the SCF's financial results during the period in question. CSES does note, however, that SCF has a target return of 20 per cent, while its most recent annual report shows that the book value of SCF investments has declined by 8 per cent, or GBP 1.4 million. CSES' assessment of the SCF's return target is that it seems high compared with European standards.

CSES comments on the initially unfavourable profitability by saying it is not unexpected for a VC fund, whose profitability is usually likened to a J-curve (see Grabenwarter and

Weidig, 2005). To illustrate this, CSES (2007) compares the SCF's brief historical (negative) profitability with the profitability trend of average VC funds in Europe (Dantas Machado Rosa and Raade, 2006), which is clearly in the shape of a J-curve (though with significantly worse profitability than that of corresponding US funds; see Figure 10). With this comparison, the authors want to show it is normal to have negative profitability during a fund's initial stages:

“Such a diminution of investment value is not unexpected at this early stage but will need to be further monitored.” (CSES, 2007, p. 35)

Figure 10: A comparison between the profitability of the SCF (minus 8% over the average investment term of one year) and the historical average return on VC investments in Europe



Source: Dantas Machado Rosa and Raade (2006)

At the time of the Hayton et al. (2008) evaluation, on the other hand, one exit had occurred, in a case where a return of 126 per cent of the invested amount was obtained. Moreover, four companies had been listed on the stock exchange with a value increase of 25 per cent for the SCF investment. In other words, Hayton et al. (2008) found a favourable break in the return curve for SCF.

SCF's administration costs

The SCF's administration costs can be divided into a fee to SCF's partners and Scottish Enterprise's own administrative costs. The administration fee is 2.5–3.5 per cent of invested capital. The total administration cost is estimated at GBP 624 000, which corresponds to approximately 6.2 per cent of the total invested capital.

Interestingly, the administration costs were significantly higher for operating the loan funds (10–15 per cent of the borrowed amount) than for operating the VC funds. This is because the loan amounts are significantly smaller than the VC investments, so it is natural for the relative administration costs to be higher.

SCF's effect on the portfolio companies

In their questionnaire survey, CSES (2009) asked the portfolio companies about their growth in terms of turnover and profitability. Here it becomes clear that almost all the

portfolio companies believe that the SCF investment had a favourable effect on their operations. The effect on turnover and number of employees is summarised in Table 8.

Table 8: CSES (2007): Investigation of changes in the portfolio companies' turnover and number of employees, $n = 40$.

Selection	Turnover	Employees
Reduction	3	3
No significant change	27	27
Increased by up to 25%	15	10
Increased by 25–50%	10	17
Increased by 50–100%	10	10
Increased by over 100%	35	33
<i>Total:</i>	<i>100%</i>	<i>100%</i>

SCF's additionality

Hayton et al. (2008) estimated that because of SCF's co-investment model, about 21–31 more companies received financing than would have done so had the SCF not existed. The main reason was that the SCF had got involved and shared the risk. In these cases, there would either not have been any investment at all or the investment would have been made in areas perceived as less risky. Hayton et al. (2008) saw several examples of companies that, through the SCF, had avoided bankruptcy and were now stable companies, which show a clear form of additionality.

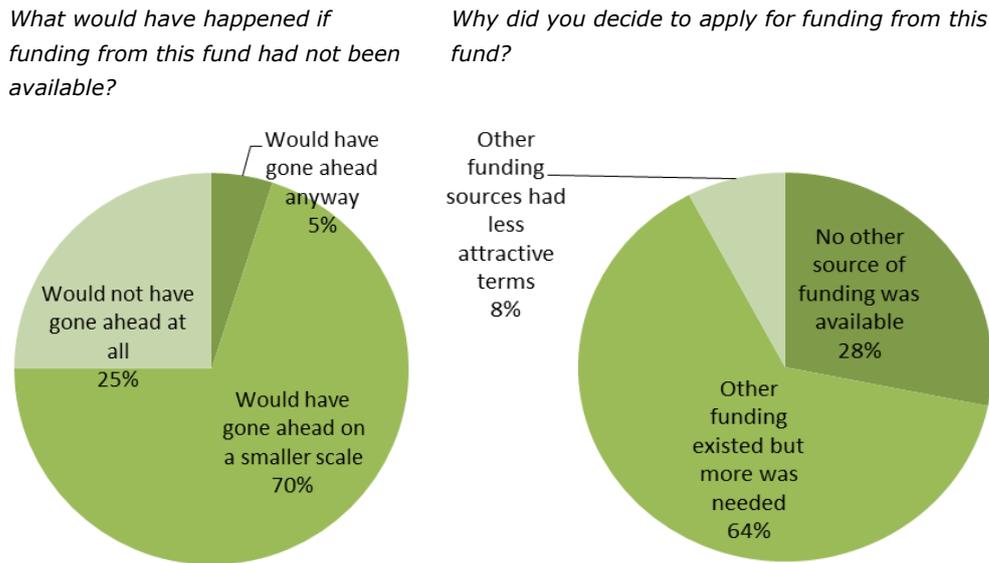
CSES (2007) analyses the SCF's additionality from two perspectives: that of the portfolio companies and that of the investors. The entrepreneur perspective was assessed on the basis of two survey questions. The investor perspective was based on telephone interviews with SCF partner investors. The SCF usually invests between 25–50 per cent in projects that their partners bring to the SCF.

The telephone interviews show that investors have had essentially two reasons for co-financing projects with the SCF: first, the *size* of the investment project, i.e., they lacked sufficient equity capital, and second, they wanted to *spread their risk*. The projects in which the SCF invests were therefore too large or too risky for the SCF's partner investors on their own. Consequently, CSES (2007) concludes that the projects that the SCF co-financed would not have been implemented by the partner investors alone. In other words, they believe that in most of the financed projects there was additionality.

“Investment partners of SCF only bring to SCF the share of those deals which they cannot finance themselves. The reason for bringing deals to SCF is often a lack of financial capacity to meet the whole of the deal, or a desire to spread risks. Such reasons imply additionality – the deals would not be entered into fully if SCF was not there. From the point of view of the enterprise, the structure of SCF makes it more difficult to measure additionality using normal techniques. This is because the enterprise will typically approach a number of private sector funders and from its point of view the effect of SCF is to improve the demand side, rather than to provide a 'lender of last resort'.” (CSES, 2007, p. 3).

CSES (2007) analyses additionality seen from the portfolio companies' perspective via two survey questions⁵⁴: "What would have happened if funding from this fund had not been available?" and "Why did you decide to apply for funding from this fund?" (see Figure 11 below).

Figure 11: CSES' questions regarding SCF's additionality from the companies' perspective; 40 of 86 portfolio companies replied to the question



Source: CSES, (2007)

My own study of the effects of venture capital in Sweden (Isaksson, 1999) can be mentioned for comparison with CSES' figures in Figure 11 above. The study also included a survey in which 158 VC-financed companies⁵⁵ answered questions on the importance of the VC financing for the company's development and growth. Note that this study involved a cross-section of VC-financed companies in Sweden regardless of the VC company's form of ownership. To the question on what alternatives to VC financing the companies had, 31 per cent replied that there were no alternatives. In other words, the replies received in the Swedish study from a cross-section of VC-financed companies were extremely close to the replies received by CSES (2007) from companies financed via SCF.

However, an important lesson from Isaksson (1999) was that the company's view of alternative financing opportunities was strongly associated with its size (and age). In Isaksson (1999), only 10 per cent of the companies in the size category 20–49 employees believed they had no other financing opportunities, whereas a full 51 per cent of the companies with fewer than five employees believed that the VC financing was their only alternative. It is also worth noting that it was the smaller companies that grew the fastest. Here, therefore, we would to some extent criticise CSES (2007) in that in their analysis

⁵⁴ A survey was distributed by CSES to 86 portfolio companies, of which 40 (46%) replied.

⁵⁵ Distributed to 249 companies; the response rate was 63%.

they make no connection between additionality and the companies' size, growth and profitability. Such an analysis could be related to the question of whether the finance gap represents a market failure or is the result of a rational behaviour. If companies that have not found any financing alternatives subsequently demonstrate growth and profitability once they have actually received this financing, it adds strength to the hypothesis of a market failure. If the result were the reverse, it would constitute support for the rational behaviour view. Unfortunately, CSES (2007) leaves this question unanswered.

However, Hayton et al. (2008) note a potential problem of crowding out. They note that there seem to be some misunderstandings concerning SCF's and Scottish Enterprise's roles. Certain interviewees thought the fund would withdraw itself from the investments as soon as possible and let private investors take over entirely. The administrative management (Scottish Enterprise) of SCF, however, felt the fund's goal was to carry out the exit that would result in the highest possible return. This implied a direct crowding out of private investors. This crowding out, however, is seen as a necessary consequence if, at the same time, the idea is to achieve the return target.

3.5.6 Innovation Investment Fund (IIF) – Australia

Background and design

The Australian Innovation Investment Fund (IIF) programme is a government VC programme that invests in private VC funds focusing on growth companies in early stages.

Evaluation by Cumming (2007)

Cumming (2007) evaluated the IFF programme using quantitative analysis of 280 VC funds and private equity funds and their investments in 845 companies during 1982–2005. This author compared differences between funds financed and funds not financed through IFF.

Based on the available data, the IFF programme was then analysed in terms of seven criteria:

1. Investments in early stages (start-ups) and...
2. investments in hi-tech companies: The programme goal was to fill the finance gap for young companies looking for growth (essentially, high-tech companies in early stages). The results show that IFF finances high-tech companies in early stages, to a considerably greater extent than other funds.
3. Step-by-step financing and...
4. syndication: Cumming uses the degree of step-by-step financing (staging) and syndication as a measure, or proxy, of the level (or quality) of consultation provided and control.⁵⁶ In other words, the more rounds of financing and the more syndication partners involved in a VC process, the higher the level of consultation and control are assumed to have occurred. The results show that, on average, IFF creates 1.2 more financing rounds and adds one additional financing provider (syndication partner) than funds not financed through IFF.

⁵⁶ Cumming finds support for this assumption in Gompers, (1995); Bergemann and Hege, (1998); Gompers and Lerner, (1999) and Schmidt, (2003).

5. Portfolio size: The more (portfolio) companies a VC fund has invested in, the less time (quality) remains for value creation and growth.
6. Exit behaviour: The proportion of successful exits (listings and sales) is seen as a measure of the degree to which a successful company has been created. This measure is close to the last measure.
7. Stock market performance after listing: It is assumed that companies that have received support from high-quality VC companies will generate higher dividend yields than other companies (other factors being equal).

Altogether, Cumming arrives at the conclusion that:

“...the IIF program has facilitated investment in start-up, early stage and high tech firms as well as the provision of monitoring and value-added advice to investees. Overall, therefore, the data are strongly consistent with the view that the IIF program is fostering the development of the Australian venture capital industry. However, the vast majority of investments have not yet been exited, and the exit performance of IIFs to date has not been statistically different than that of other private funds. Further evaluation of IIF performance and outcomes is warranted when subsequent years of data become available.” (Cumming, 2007, p. 193).

3.5.7 Yozma and Inbal - Israel

Background and design

The Yozma programme was established by the Israeli government in 1993, through an investment of USD 100 million. Of this amount, USD 20 million was used for direct investment in young high-tech companies, while USD 80 million was invested in ten co-investment funds. The total capital in each fund was between USD 20 and 25 million (representing an aggregate total of USD 210 million). Of this, 40 per cent came from the Israeli government and the remainder (60 per cent) from foreign investors (IVA, 2010; Yozma, 2010).

The argument for the public sector's intervention in the risk capital market was an assumption of market failure. Growth companies in early stages did not have access to the capital they required for growth. The private market had failed to see these companies, so public measures were required. Evaluators (Avnimelech et al., 2009; Avnimelech and Teubal, 2004a) argue here that it was more a question of system failure than market failure.

A significant incentive for the foreign private investors' participation was an option for them to buy out the government share at a predetermined price within a five-year period. The price corresponded to the investment cost plus 5–7 per cent interest (Avnimelech et al., 2009; Avnimelech and Teubal, 2004a). In addition, there was an opportunity for Yozma to make direct investments, either entirely free-standing investments or supplementation of a fund investment with a direct investment by Yozma (IVA, 2010).

Yozma is generally considered very successful. Avnimelech (2009), for example, sees Yozma as the critical factor behind the growth of the nowadays internationally competitive Israeli VC market: “*VC emergence in Israel was a policy-enhanced process*”, (Avnimelech, 2009, p. 1). Before Yozma was introduced, in 1993, there were only a few VC companies in Israel. Today, the country has (according to IVA, 2010) an

internationally established and acknowledged VC industry with close to 80 VC funds managing a capital of over USD 10 billion.

The programme made a total of fifteen direct investments. Of these investments, nine led to extremely favourable exits, either through listing or through sale. The programme succeeded in attracting a number of highly experienced international investors from the US (e.g. Advent, MVP, CMS), Europe (e.g. Daimler-Benz, DEG, the Van Leer Group) and Asia (e.g. Oxton, AVX, Kyocera) (IVA, 2010).

A further example of Yozma's success was that in nine of the ten funds established the private investors utilised their buy-out option.

Yozma was privatised in 1997, generating a return to the government of more than the initial invested amount.

It is important to note that Yozma was one of many programmes established to strengthen commercial growth. Such programmes also included Inbal (another VC programme) and programmes designed to stimulate the demand side – for example, incubators and R&D programmes (Avnimelech, 2009).

One factor that must definitely be taken into account when considering the Israeli example is the country's current context. Avnimelech and Teubal (2003) claim that the development of the Israeli VC market can be seen as a:

“...path-dependent process involving a broad set of economic, societal and even geopolitical factors – some endogenous and some exogenous – spanning 2–3 decades.”
(Avnimelech and Teubal, 2003, p. 9)

Avnimelech (2009) emphasises particularly the following driving factors:

- The ascendancy of Nasdaq (capital market for small companies)
- The Oslo process (the peace agreement that created stability)
- Immigration from Russia of highly educated labour trained in high-tech
- Immigration of entrepreneurial and financially experienced people from the US
- Regulatory changes that improved opportunities for risk capital investments and entrepreneurship

Evaluation by Avnimelech et al. (2004)

Scientific studies on Yozma are dominated by studies done by Gil Avnimelech (e.g. Avnimelech, 2009; Avnimelech et al., 2009; Avnimelech and Teubal, 2003; 2004a; b; 2006).

Avnimelech (2009) emphasises the growth of the Israeli VC market as entirely policy-driven – as a result of the Yozma programme. Moreover, the paper underscores particularly the fact that the buy-out option was exercised in eight of the ten funds and the nine of the fifteen direct investments led to successful (profitable) exits.

Avnimelech and Teubal (2004b) analyse the Israeli government's policy measures in the VC area and from that attempt to establish lessons learned for other countries. One of their main theses is that the primary impediment to developing a VC market is system failure, not market failure. The implication of this is that a focused policy aiming to create a VC

industry should focus on systems that attract professional risk capitalists and should channel the industry toward investments in growth companies in early stages.

One key point is that the favourable experience of the Israeli government's VC interventions occurred against the background of an extremely good set of internal and external conditions, and is (as is so often the case with policy decisions) not directly transferable to other countries.

“Yozma was implemented at the right time, the outcome of an evolutionary process and luck.” (Avnimelech and Teubal, 2004b, p. 110).

Inbal – an unsuccessful Israeli attempt

Prior to Yozma, another attempt was made to create a VC market in Israel via a programme dubbed “Inbal”. It is easy to assume that Yozma was mainly an effect of a cultural and political climate (in the right place at the right time) rather than an effect of the design of the programme. So it might be relevant to focus on an earlier, less successful, Israeli initiative to stimulate the VC market: Inbal. By comparing these two programmes, we may possibly reduce the effect of time and place⁵⁷.

Inbal was initiated in 1991, about two years before Yozma. The central idea was to stimulate VC investments through a system of loss guarantees. The actual mechanism was a government-owned insurance company, Inbal, which gave 70 per cent loss guarantees to VC companies traded on the Israeli stock market (Tase). The guarantee naturally coincided with a number of restrictions on what a “protected” VC companies could invest in. In total, four protected VC companies were created. The publicly traded funds quickly ran into many problems. The companies were valued extremely low by the market; it was difficult for them to attract new capital; and they were associated with a great number of bureaucratic problems. It became clear that the loss guarantee system did not create sufficient incentives for the funds to offset the costs that resulted from the bureaucratic regulatory framework. An adverse effect of the loss guarantee system was that it created a situation in which less competent players were given space – as opposed to a profit-sharing system that rewards favourable efforts. With time, the protected VC companies started to want to leave the Inbal system, which all of them succeeded in doing. All previously Inbal-protected VC companies merged with traditional investment and holding companies (Avnimelech, 2009).

Comparison between Yozma and Inbal

Table 9, below, summarises the differences between Yozma's and Inbal's designs and effects.

⁵⁷ Here, it should perhaps be pointed out that the time effect may linger on. For example, Avnimelech (2009) points out that the peace created by the Oslo process (signed in August 1993) was a key prerequisite for Yozma – a prerequisite that was absent two years prior, when Inbal was initiated.

Table 9: A comparison of two Israeli systems for creating a domestic VC market: the successful Yozma and the unsuccessful Inbal.

Yozma – Design	Inbal – Design
<ul style="list-style-type: none"> – The programme, initiated as part of the government's economic (commercial) policy, was set up as a co-investment project (risk capital investments in hybrid funds without active intervention in fund operation). – One objective: To create a competitive domestic VC market in Israel. – A clear objective for a critical mass of capital and investments (USD 250 million, with USD 100 million in government grants). – A clear purpose: to create a VC market with competition (ten funds). – Funds in accordance with the limited partnership model (model from the USA) – Clear focus on investment in early stages. – Strong incentives for learning ("learning by doing and learning from foreigners"). – Government direct investments (aside from the funds) spurred the funds to quickly get under way. – Management's ability was a key criterion on which fund managers were to be chosen. – Incentives through both risk-sharing and profitability. The option to buy out the government at a fixed (low) price spurred participation by professional VC teams. 	<ul style="list-style-type: none"> – The programme, initiated as part of the government's financial policy, was set up as a government insurance company (loss guarantees to VC funds). – Double objectives: To stimulate both the public (stock exchange) and the private (VC) risk capital market. – No direct goals or strategies concerning size or critical mass. – No clear purpose regarding competition; only four funds created. – Publicly traded VC companies, difficulty in accessing capital, short-termism, and bureaucracy. – Investments occurred both in latter stages and in non-high tech. – No learning incentives. International experience lacking. – No incentives to fast action. – The administrative and financial criterion was prominent in the selection of "protected" VC companies. – Loss guarantees favoured the entry of less competitive VCs and gave no incentives to success.
Yozma – Effect	Inbal – Effect
<ul style="list-style-type: none"> – A critical mass of VC investments was created. – Yozma-initiated funds are among the most prominent in Israel. – Many new funds and follow-up investments involving strong growth. – The Yozma design became a model for other VC funds in Israel. 	<ul style="list-style-type: none"> – No critical mass was achieved. – There was no Inbal company among the twenty most profitable. – Few follow-up investments; companies gradually phased out. – Few publicly traded VC companies have been launched after this.

Source: Avnimelech, 2009a, p. 9

3.5.8 New Zealand Venture Investment Fund (NZVIF)

Background and design

The New Zealand Venture Investment Fund (NZVIF) was formed in 2002 with USD 100 million in managed capital, and in accordance with the following structure:

NZVIF is a government-owned company, but with independent, non-political management selected purely on the basis of their experience in VC and entrepreneurship.

NZVIF operates according to a fund-in-a-fund principle, whereby the company invests in private VC funds (VIF Seed Funds). NZVIF invests with a 1:2 exchange in these funds. The funds in which the company invests must have a minimum of USD 30 million in capital. At the time of the evaluation by Lerner et al. (2005), six funds had been established, of which five were still active.

NZVIF invests in the funds on the same terms as do the private investors, with the following significant exceptions:

- The private investors have an option to buy out the NZVIF investment in five years, at an amount corresponding to the investment plus interest. In other words, the investors have an opportunity to access the value appreciation occurring over and above this amount within this period.
- The fund must invest in accordance with the guidelines established by the NZVIF.

The set-up of the New Zealand Venture Investment Fund essentially mirrors the Israeli Yozma programme.

Evaluation of Lerner et al. (2005)

First, Lerner et al. (2005) conduct an overall evaluation of the New Zealand venture capital market. One of the most important conclusions highlighted by Lerner and Moore regarding government interventions for VC is that:

“...the most important steps that policymakers can take are to create an environment that is conducive to venture investment. Far too often, policymakers have been tempted to directly intervene in the venture market in a way that has ignored the real possibilities and needs of the market.” (ibid, p. iv).

Lerner et al. made no quantitative evaluation of the programme, but rather primarily a theoretically based analysis drawing on interviews with market players. At the time of this evaluation (2005), however, NZVIF had NZD 35 million remaining to invest of its original NZD 100 million, and it was considered that the programme was apparently justified.

The programme was clearly based on the model of the Yozma programme. From the analysis by Lerner et al., we can draw several interesting parallels between the explanations emphasised by Avnimelech (2009, 2004) as success factors behind the Israeli programme. Avnimelech (2009, 2004) stresses in particular the importance of learning: *“learning by doing and learning from foreigners”*. This learning was achieved by having local private risk capital engage with international investors. Lerner et al. (2005) obviously underline concerns relating to these problems:

“However, since the inception of NZVIF, to our knowledge no new venture capital fund has been established without the backing of NZVIF. Thus the goal of self-sustainability

appears to be still some way off and it appears so far the sector still requires the involvement of NZVIF to stimulate the market.

To date neither local nor international institutional investors have invested in the VIF Seed Funds (with one exception). Their involvement will be critical to a self-sustaining sector. (ibid, p. 6).

3.6 Summarising discussion

From the analyses of current empirical research on government actions to promote risk capital investments in early stages there is much to learn and discuss. I have elected to focus on a few key aspects.

The evaluations often have different goals and levels of analysis, so it is not possible to make overly systematic comparisons between them. Certain evaluations content themselves with focusing on the effects of the programme in question on the companies (e.g. Lerner, 1999, and Cumming, 2007). Other studies are more comprehensive and set goals and purpose in relation to effects. In some (far too few in my opinion) studies, there is also a systematic analysis of programme additionality and crowding out effects, if present (e.g. CSES, 2007). Crowding out effects are difficult to measure methodologically; here, however, Cumming and MacIntosh (2003) demonstrate an innovative approach. It is clear that the depth of the evaluations is steered by the instructions given by the parties commissioning the evaluations.

We can see a number of interesting aspects arising from the extensive material made up of the evaluations and analyses:

- Market failure or rationality
- Additionality or crowding out
- The role of context
- Regional interventions
- Incentive structures
- Profitability requirements

3.6.1 Market failure or rationality

The hypothesis of a market failure has limited support from research. It is more a matter of a rational response by players to overly restricted or underdeveloped markets.

The underlying motivation for public sector intervention in VC markets is almost entirely without exception an assumption of a finance gap.

“The UK government has identified the so-called “equity gap” as the main problem facing small growth businesses.” (Cooke, et al., 2006, p. 5).

Briefly stated, a finance gap implies that companies that require capital cannot obtain the financing they need. In the context of VC policy, the focus is on the financial problems experienced by growth companies in early stages. Moreover, the finance gap is assumed, in most cases, to be an effect of a market failure. “Market failure” is taken to mean there is a profitable market for investment in these companies, but that market has not found them.

From the evaluations and market analyses studied, a fairly critical attitude to the hypothesis of a market failure emerges. It is claimed instead that the shortage of capital is due to rational behaviour.

One of the most common arguments against the hypothesis of a market failure is the extremely marginal (small) growth effects – on the companies financed.

“Companies that are recipients of funding under one or more of the government hybrid funding schemes examined do not yet exhibit significantly better performance. This suggests that the UK does not possess an untapped resource of high potential firms whose (greater) performance will be unleashed by simply making available more equity finance within the ‘equity gap’.” (Nightingale, et al., 2009, p. 20).

Why does the finance gap arise then, if it is more an effect of rational behaviour? Nightingale et al. (2009) explain the gap as an effect of thin markets. They argue that when the markets on both the supply side (the VC companies) and the demand side (the growth companies) are too small, the costs of finding one another become excessive. In a thin market, companies complain that there are not enough investors and the investors complain that there are not enough companies to invest in, and both sides are correct.

The argument about thin markets can also be related to Avnimelech and Teubal's (2002) discussion on system failure. They claim that the finance gap for companies in early stages is a system failure rather than a market failure.

“We suggest that the main obstacles in developing a significant high quality VC industry are system failures (and not market failures). This implies that targeted policies aim to create a VC industry should focus on system measures such as attracting professional venture capitalists and channelling the industry toward investment according to strict VC definitions.” (Avnimelech and Teubal, 2002, p. 1)

3.6.2 Additionality or crowding out

Public sector actions should complement the private sector and not compete with it or “squeeze it out” (crowding out). This is clearly easier said than done. Government VC programmes often fall into the cracks between the requirement of additionality and the requirement to operate on equal terms as the private market, which implies a risk of competing with it.

“Additionality – Venture capital programmes should seek to stimulate private sector funding and create a commercially viable market, which would allow government schemes to be phased out as private sources of capital expand.” (OECD, 1997, p. 4).

Additionality is a key concept when analysing the public sector's involvement in the risk capital market. Additionality is, for example, one of the fundamental principles of the EU's subsidy policy, under which community support is to complement the member state's own grants and not reduce them (support is provided in combination with, and not instead of, support from member states.) Additionality need not only be seen against the background of existing support; it is also important to observe how an action affects the private market. Additionality can be defined as *the extent to which it is probable that a certain action, activity or result would have occurred even without the policy intervention under study.* If you establish some sort of advantage for risk capital investments, the question becomes one of additionality: how many of the risk capital investments made using government subsidy would have occurred even without the subsidy? The fewer completed investments

that would have occurred if the policy measure had not been implemented, the greater the policy action's additionality.

If the additionality is negative (subtractivity?), it implies that more investment would have occurred without the policy intervention than with the intervention. A concrete example is Cumming and MacIntosh's (2006) study of the effects of the Canadian tax subsidy for risk capital investments extended to LSVCFs. Cumming and MacIntosh (2006) conclude that without the tax subsidy, 400 more investments would have been carried out per year (for a value corresponding to CAD 1 billion) than were carried out with the tax subsidy. The concept used when additionality is negative is usually "crowding out".

"The data suggest that crowding out has been sufficiently energetic as to lead to a reduction in the aggregate pool of venture capital in Canada, frustrating one of the key governmental goals underlying the LSVCC programs; namely, the expansion of the aggregate pool of capital". (Cumming och MacIntosh, 2006, p. 570).

The study by Cumming and MacIntosh (2006) differs in two respects from most of the other studies that analyse or evaluate different forms of public sector intervention in the VC market. The first is that it is one of the extremely few studies that actually attempts to objectively measure additionality and crowding out. The second (which perhaps partly explains the first) is that it was not carried out as a traditional ex post study. Instead, using scientifically supported models as a base, the authors mathematically simulate the development of the Canadian VC market and then compare the result with reality (which includes LSVCFs).

In the few evaluations that deal with additionality, in most cases this analysis is done after the measure has been implemented (ex post), creating a number of methodological problems. The most common method is to interview market players and ask them to say whether they think the measure (the investment) would have been carried out without the policy action:

"You have received a government grant of SEK XXX because you made an investment the government wanted you to make. Assume this grant did not exist: Would you then have carried out your investment anyway?"

How would a rationally thinking person answer such a question? How easy is it to say what one would have done four years ago "if something had not existed"? Add to this the fact that the question cannot always be answered with a Yes or a No either, but rather that it entails a sliding scale of probabilities. In other words, there are numerous difficult methodological problems involved.

If the intervention is a complement to or a support for private investment, it implies an additionality to existing markets. Terminologically, the opposite of additionality should be "subtractivity". Subtractivity implies that one investment reduces another investment. More common in this context would be the expressions "crowding out" and "crowding out effects".

Extremely few studies seem to deal with the problem of additionality. Those that do employ methods that can easily be criticised as being self-fulfilling. If you ask someone whose professional existence is based on a programme's additionality, it should be fairly easy to obtain the answers you want.

A further dilemma in connection with measuring the additionality is that it can shift over time. Two examples: The measures taken by the Swedish government in the early mid-

1990s may be seen as supplementary at the time – however, a few years later there was an oversupply of capital. The Scottish Co-investment Fund is criticised for holding on to profitable investments right up until exit, in order to achieve its high profitability targets. At that point, there will undoubtedly be private players that can take over. So one might say the fund is complementary in the *beginning* of the investment process but crowding-out at the *end*.

One way to indirectly measure additionality, a way proposed by OECD (1997), is to focus on a programme's profitability or failure rate. The argument is basically that if a programme has a low failure rate, private players should be interested in dealing with the same problems.

“If a programme has a negligible default rate, this suggests the government is providing little additionality. At the same time, very high failure rates can become unacceptably expensive and undermine the programme.” (OECD, 1997, p. 14)

This adds yet another dimension to paradoxes facing many government VC systems. On the one hand, they are supposed to complement the market and be additive, while on the other, they are subject to profitability requirements and requirements that they operate on the same terms as do market players. On the one hand, they are expected to invest in companies in the most attractive growth sectors, while on the other, they are asked to do this in regions where such companies do not exist.

Applying the OECD's measure of additionality, if a programme is successful in implementing a VC model in a region (i.e., achieves profitability) that could be interpreted as a failure (i.e., crowding-out). In other words, it's not good if the results are good, and it's bad if things go badly!

3.6.3 The role of context

The environment (context) in which a VC programme must operate is often a critical factor in explaining why a certain programme succeeds or fails. This is nevertheless a factor that is often overlooked.

In this context, a frequently cited source is Black and Gilson's (1998) study of how differences between bank-led capital markets and proprietor-controlled (equity-based) capital markets affect the development of a country's VC market. Developing a VC market is simpler in a country whose capital market is more proprietor-controlled (e.g., the USA) than a country that is more bank-controlled (through loan capital), such as Germany or Japan.

It is important to take cultural or national characteristics into consideration, to understand why some systems work better or worse in different countries. The successful Israeli example of the Yozma fund is perhaps the clearest example of the importance of external and internal factors that become interlinked at the right time. Highly educated Russian immigrant engineers came into contact with commercially experienced, savvy, American immigrants. A unifying external threat that is parallel to a peace processes that create stability and open the door to (less risky) international investments. Having these factors in place creates uniquely favourable conditions for a stimulus package like Yozma to be successful. At the same time, however, Israel tests other systems that prove unsuccessful. If we transplant a “successful system” like Yozma into another regional and cultural context, such as New Zealand, for example, many of the elements required to make the system work are absent. The New Zealand system is still far too new for any conclusions

to be drawn about possible success or failure. There are several aspects, however, in what Lerner (2005) observed, that will become challenging.

3.6.4 Regional interventions

Many public VC programmes involve a regional policy agenda. The hope is that venture capital will create growth in a region that lacks growth. This often implies problems. Venture capital is drawn to growth regions, but does not create them.

When attempting to create regional growth using government VC interventions, it is important to consider the context. Richard Florida demonstrated this in his studies on regional development and venture capital (Florida and Kenney, 1988a; Florida and Smith Jr., 1990; Florida and Kenney, 1988b). Avnimelech and Teubal (2002) develop it further and with their analyses of the Israeli models (Inbal and Yozma) can further strengthen the argument that venture capital only works in a context in which the right infrastructure for growth is already in place. Regarding all of the failed VC experiments of the 1980s and 1990s, Avnimelech and Teubal (2002) have the following comment:

“This failure was related to the following facts: VC investments flow mainly to established high tech centers regardless of the geographical location of the VC industry – a fact which means that it has a weak impact in regions without established high tech clusters. The impact of VC is context sensitive since it may have a significant high tech growth impact in established high tech regions. It follows that for VC directed public policy to be successfully the VC industry support must be part of a broader and more comprehensive set of policies which supports the whole high tech cluster (R&D, innovation, startups, and exit)”. (Avnimelech and Teubal, 2002, p. 13–14).

Apart from the contextual problems of regional programmes, there are often also built-in goal conflicts with regional government risk capital interventions. Riksdagens revisorer (the Parliamentary Auditors) (1996) evaluation of six regional investment companies in Sweden provides a concrete example of problems with regional VC funds.

“On the one hand, the [VC-]company was formed to handle tasks with which the market has been deemed unable to cope. On the other hand, it has been presumed that the companies would operate on market terms. Consequently, it has never been established whether these companies would operate on entirely normal commercial terms or if, for example, employment reasons were to take precedence.” (Riksdagens revisorer, 1996, p. 22).

That it is difficult to steer VC investments away from growth regions could be seen in the evaluation by the Scottish Co-investment Fund (CSES, 2007) and Small Business Innovation Research (Lerner, 1999).

The observed problems with regional government VC programmes are hardly a new phenomenon. The problems noted by the Parliamentary Auditors in their report from 1996 had also been discussed much earlier. The following quotation is from Christer Olofsson's study of regional development companies (government VC companies) from the early 1980s.

“The built-in goal conflict of many of the organisations studied, in that they are asked to involve themselves in projects on commercial terms while engaging with players strongly interested in direct employment undertakings, has created a duality that has been destructive for the operations.” (Olofsson, 1983, p. 102).

The goal conflict – between being a commercial player and an instrument of regional policy – leads to what Olofsson (1983, p. 102) calls the “schizophrenic organisation”.

3.6.5 Incentive structures

Incentive structures that stimulate co-investment by private players are important for a VC programme's chances of success.

Using various forms of incentive structures, the public sector attempts to entice the private VC market to invest in earlier stages than it would otherwise have done. The incentive structures might be anything from simple risk-sharing on equal terms in co-investment funds, to any of various profit-sharing or loss guarantee systems.

It is clear that the incentive systems influence investor behaviour.

The Scottish Co-investment Fund (SCF) operates exclusively as a co-investor. The incentives for the private investors to participate were partly to obtain a financial lever on funds invested and partly to spread the risk. The effect of this system was to make SCF attractive primarily to informal risk capitalists (business angels and networks).

The Israeli Inbal was a system involving loss guarantees. According to the evaluations, this led to a moral hazard problem that attracted less experienced investors to make more risky decisions than they otherwise would have done, since their potential losses were limited.

Yozma became the successful Israeli model. Under this programme, the private coinvestors had a five-year buy-out option. This created an incentive to carry out successful investments and also attracted formal and international venture capital.

3.6.6 Profitability requirements

Government profitability requirements on VC funds must be adapted to the normal profitability structure of the VC model (the “J-curve”). A high, straight profitability requirement involves a risk of investments being “forced out” of early stages.

For example, Maula and Murray's (2003) analysis of Finland's Industriinvestering (FII) showed that the profitability requirements created short-termism and “forced” FII out of investing in early stages and into later stages.

3.6.7 Is the VC model “The Model”?

Venture capital is a form of financing suitable for a few rapidly growing companies.

This begs the question whether the VC model is the right model for creating growth.

A general misunderstanding is that a VC fund in a region is the solution for many companies. Even if we disregard the fact, stressed by Florida and Kenney (1988), that more than money is necessary to create growth in a region, the fact remains that venture capital is a form of financing for only a few selected companies with extremely high growth potential.

Some observations that support this point:

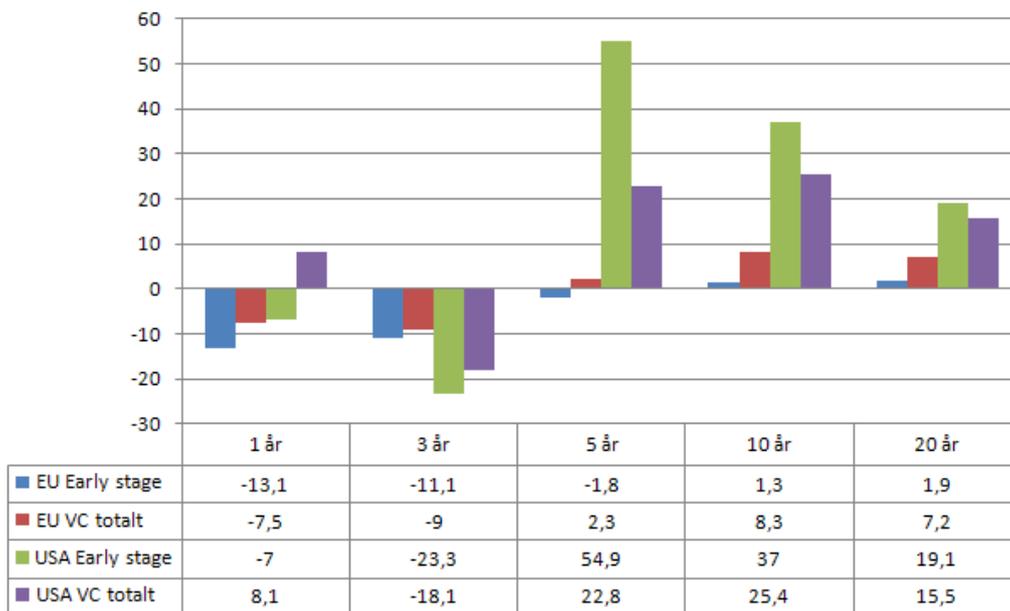
- Reynolds et al (2003) estimated that only 0.5 per cent of all companies in the USA are financed with venture capital.
- SBS (2005) estimated that only 2 per cent of all companies in the UK have sought VC.

- Bürgel (2004) analysed the fastest-growing high-tech companies in Germany and the UK (the target group for most VC) and found that only 10 per cent of these companies in the UK were financed by venture capital; in Germany, the proportion was even lower – just over 7 per cent.

There is always a risk that government VC actions will take the focus away from the large population of companies and from general measures to promote entrepreneurship and growth.

Dantas Machado and Raade (2006) analysed the profitability of VC investments in Europe and the USA, see Figure 12. The result reveals extremely low profitability for VC in Europe. The average return (IRR⁵⁸) at the end of 2003, was 2.3 per cent for five-year investments and 8.3 per cent for ten-year investments. However, that is the average for all investment stages. If early-stage investments are broken out, profitability sinks lower, to -1.8 per cent over five years and 1.3 per cent over ten years. The American VC industry is significantly more profitable. For the entire VC sector, profitability in the USA during the same period was 22.8 per cent over five years and 25.5 per cent over 10 years. If early-stage investments are broken out, the USA becomes even more superior to European VC, reaching 54.9 per cent over five years and 37.5 per cent over ten years.

Figure 12: A comparison of VC investment profitability in Europe and the USA over 20 years. Pooled, averaged IRR percentages for the periods one year [1 år] (2003), three years [3 år] (2001–2003), five years [5 år] (1999–2003), ten years [10 år] (1994–2003) and 20 years [20 år] (1984–2003).



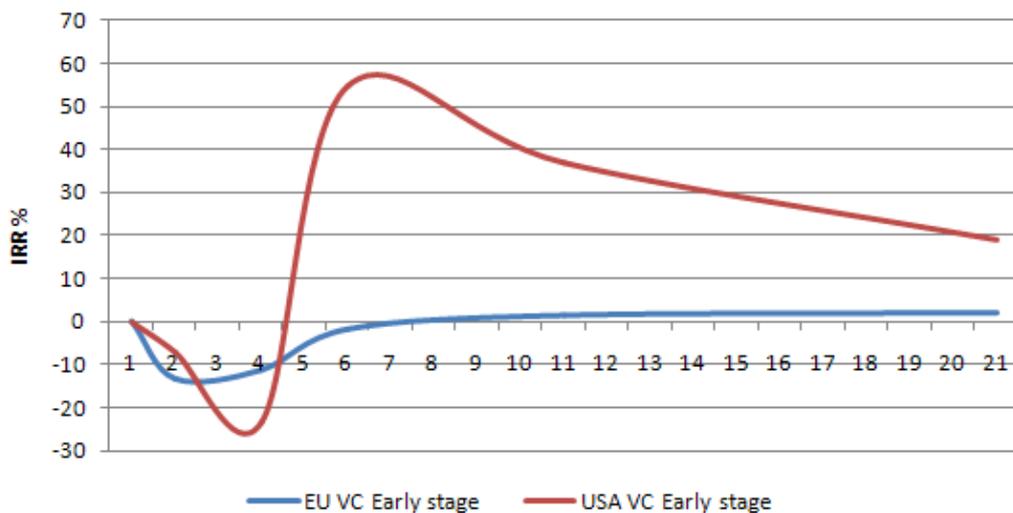
Source: (Dantas Machado and Raade, 2006).

⁵⁸ In private equity, risk capital funds' profitability is usually assessed using the Internal Rate of Return (IRR). IRR is measured as the annual effective return using cash flows and valuations. "Pooled" means that all investments in a given fund are combined into one, on which the rate of return is then calculated. See, for example, EVCA, (2010).

Larssen and Lindström (2009) are one of the few studies that attempted to calculate the return on the Swedish risk capital market (data from Thomson Reuters). Considering the Swedish market's size and limited history, however, the figures should be interpreted with some caution. However, Larssen and Lindström (2009) arrive at an IRR of -3 per cent over five years, 11.6 per cent over ten years and 14.5 per cent over 20 years. In other words, the results for Sweden (according to Larssen and Lindström, 2009) are worse than for the USA but better than average for Europe.

In Figure 13, below, I have broken out early-stage VC in the USA and Europe into two J curves.

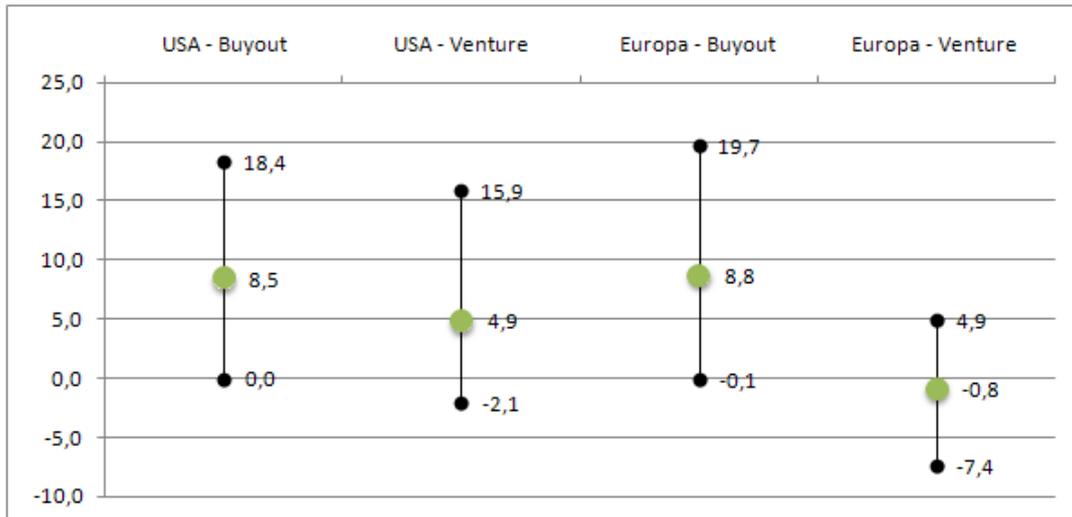
Figure 13: J-curves for venture capital in Europe versus in the USA.



Source: Based on Dantas Machado and Raade (2006).

In another study, Gottschalg (2009) compares returns for various forms of private equity and the returns for the USA and Europe in the period 1969–2007 (see Figure 14). The results indicate the same clear direction as did Dantas Machado and Raade (2006), that is, that European venture capital underperforms its American equivalent.

Figure 14: Returns for private equity in the USA and Europe, 1969–2007. The points show the bottom, median and top quartiles for the returns.



Source: Based on Gottschalg, 2009.

3.6.8 Suggested topics for in-depth study

Clearly, there are many areas that warrant of further detailed examination or interventions. Here are a few brief suggestions.

Efficient follow-up systems (VC data)

“Governments should invest in appropriate methodologies which can accurately measure investment trends in the early stage venture capital market... so that the need for public sector intervention can be demonstrated and the impact of such interventions can be measured.” (Mason, 2008, p. 1).

The VC market is characterised by insufficient data that is difficult to access, and this applies particularly to the Swedish market. There is a need for an objective database that would make it possible to follow up and analyse government VC programmes.

A systematic, quantitative approach

This report was carried out using a relatively qualitative approach, in which a few subjectively selected VC systems were chosen and analysed in depth. There is a need to complement this approach with a more systematic, quantitative approach.

Sector-oriented or general interventions

In Nightingale (2009), it was shown that limitations (e.g., geographic or industry-specific) make the VC markets even thinner and more difficult to make profitable. At the same time, there is a trend to stimulate certain special sectors via various VC models. A global trend in this respect is various programmes focusing on promoting cleantech companies (i.e., companies that manufacture products or services that reduce human environmental impact in various ways).

How well might a potential in-depth study succeed in analysing the effectiveness of such sector-oriented interventions?

In-depth country studies

There are many countries that would benefit from an in-depth follow-up. Three suggestions:

- The UK: Has many programmes that lend themselves to comparison with a relatively equivalent context.
- Australia: A country that in many respects is close to Sweden (albeit far away geographically). Has tested many programmes, with relatively weak results.
- Germany: A large, bank-oriented (Black and Gilsson, 1998) country with several relevant systems in place.

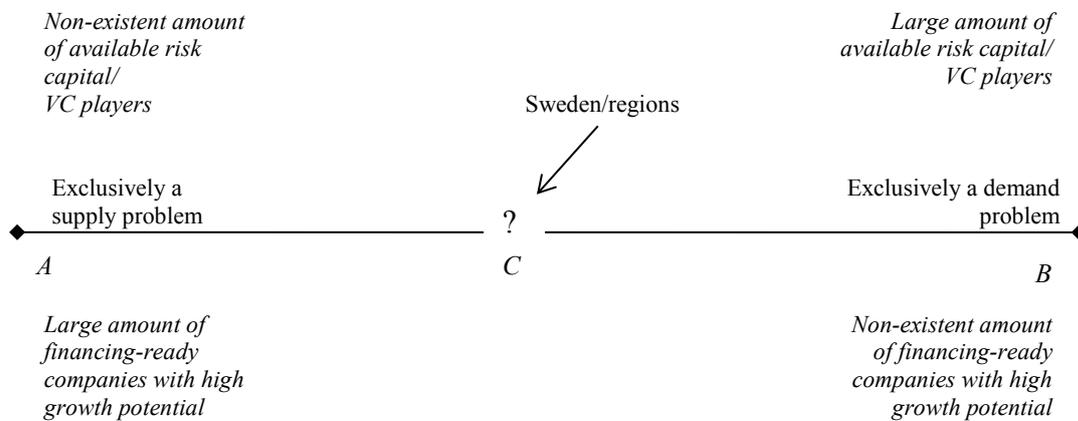
4 Policy discussion

Based on the structure of the intervention and the research survey presented in chapter 3, certain aspects and issues of policy relevance will be discussed below.

4.1 Finance gap

The preliminary studies (country and regional) referred to in section 1.3 point to the occurrence of imbalance between the market's existing supply of risk capital and companies' demand for risk capital – that is, a *finance gap*. The finance gap is then the fundamental problem that the intervention seeks to reduce. The interpretation of the imbalance points, as in the case of the Scottish Co-investment Fund, to a basic assumption of the existence of a supply problem: In Sweden (and Scotland) there is a significant number (regionally distributed) of investment-ready companies with great growth potential, whose financing requirements cannot be met by the market. Based on such an assumption, a measure that increases the supply of risk capital may appear logical. It can be worth recalling, however, that an imbalance (or balance) has two sides – the supply and the demand.

Figure 15: Schematic positioning line for supply and demand on a capital supply market



Schematically, a finance gap can be illustrated by Figure 15 above. In point *A*, the problem is one of supply only, whereas point *B* represents the other extreme – with all the deficiencies on the demand side. There are likely very few, if any, countries or regions on the extreme points; on the other hand, the actual situation *C* on the imagined positioning line is debatable. The position *C* could also affect the outcome of a measure. A straight supply-oriented finance intervention could, based on principles of marginal utility, be expected to have better effect the closer to point *A* the country or region is, and worse effect the closer to point *B* it is.

A relevant policy question to ask is where point *C* is for Sweden's eight programme areas? If the position of *C* is not identical, then the effect of a supply-oriented capital supply intervention could be expected to vary between the programme areas.

4.2 Market failure and capital supply markets

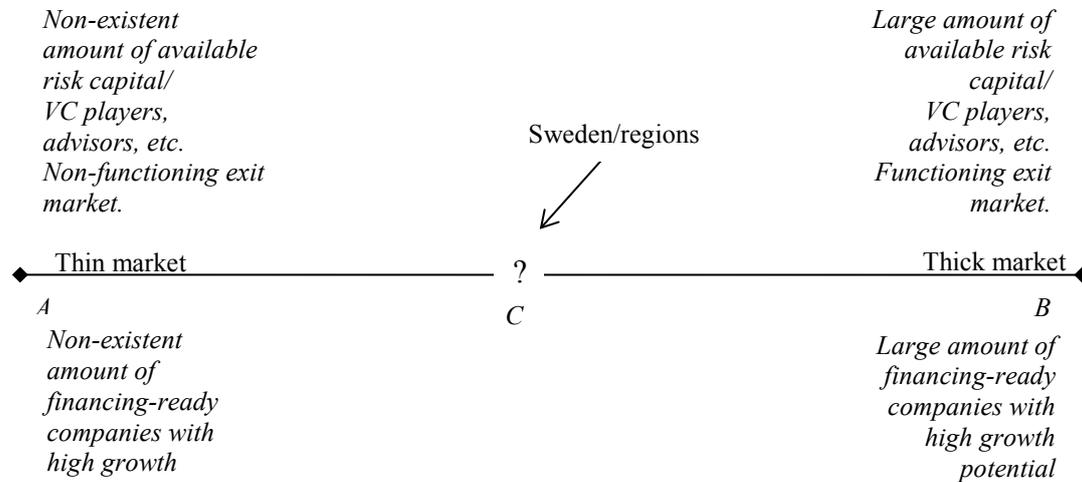
The above discussion suggests that Sweden (and, for example, Scotland) in the design of their capital supply actions are assumed to be positioned closer to point *A* than *B* in Figure 15, that is, a *supply-side* problem. If this conclusion is correct – and there are a number of financing-ready growth companies that actively seek financing – why does the market not perceive this need? Is it a *market failure* and thus a reason for government intervention? In Isaksson's research survey, a critical attitude to market failure appears. Arguments relating to high risks, an expectation of low returns, proportionally higher transaction costs for small investments, etc., favour, if anything, market rationality. Rational VC players would then, according to this discussion, correctly find that the uncertainty and risk are too great compared with the expected returns and choose to refrain from taking action in this segment.

A finance gap can be seen – regardless of whether the issue is one of market failure or market rationality – as a *problem* for public finances, to the extent start-ups with growth potential are placed at a disadvantage. Such a discussion is presented in the research overview with reference to British experience (Nightingale *et al*). The report referred to discusses the “viscosity” of the capital supply market (the occurrence of thin versus thick markets).⁵⁹ A thin market has relatively few players on both the supply and the demand sides. This creates difficulty (time and costs) for the two sides to find each other and establish contracts. In a thick market, the opposite applies: here, there are many players that interact frequently with each other. Investors have sufficient size and management competence to carry out the necessary investments and otherwise support the portfolio companies as well. In such a market, there are also a sufficiently high number of high-quality advisors and a properly functioning, liquid exit market.

Figure 16 is intended to schematically illustrate such a discussion. Point *A* corresponds to a conceivable extremely thin market, whereas point *B* represents the opposite – a fully developed thick market. It would be reasonable to assume that the eight programme areas do not have identical *C* positions. Just as for Figure 15 the effect of different policy measures can be expected to vary with the country's or the region's positioning *C*. The closer point *A* that point *C* lies, the clearer the need that policy measures in this area must contain more than just an increased supply of financial capital.

⁵⁹ Nightingale et al, (2009), *From Funding Gaps to Thin Markets: UK Government Support for Early Stage Venture Capital*.

Figure 16: Schematic positioning line for the viscosity of a capital supply market



Even when capital supply markets are described in this way, the logical conclusion is that it is important to see the action in its context. The success of any policy action can vary depending on the regional circumstances, regardless of the expertise and efficiency of the individual fund. One alternative to a uniform action could be to adapt the tools to the regional circumstances. Policy measures on the demand side and capital supply instruments other than venture capital could then be discussed.

4.3 Expectations and goal structure

Isaksson's research survey discusses the risk of unrealistically high *expectations* on venture capital. While for the right company and in the right context it is an extremely powerful financing instrument with an ability to create growth (see, e.g., impact on the American economy), there is also a need for moderation of expectations. Venture capital is a form of financing suitable for a limited number of companies with extremely high growth potential. A small number of successful investments can yield exceptional returns upon exit – however, most investments at early stages fail or generate extremely modest returns. Venture capital is not the solution for the majority of companies with financing needs. Venture capital itself cannot reverse an economic trend in regions with weak business activity. Experience from e.g. Lerner's study of SBIR suggests that venture capital is more drawn to growth regions than likely to create them. Even in the USA, the occurrence of qualified venture capital is geographically unevenly distributed. Despite over fifty years of development, Nightingale *et al.* point out that: “*world class venture capital expertise in the USA is limited to a few clusters adjacent to the leading universities on the East and West coasts.*”⁶⁰

Regarding the specific capital supply intervention studied here, Growth Analysis has identified a number of expectations on its results and effects. They are not always mutually compatible.

- For example, if expectations on the level of the return on the risk capital (revolving degree) are prioritised, there is a risk of a conflict with the focus of the target group (early-stage companies/high risk) and its growth. Such a prioritisation gives the funds

⁶⁰ Nightingale et al, (2009), *From Funding Gaps to Thin Markets: UK Government Support for Early Stage Venture Capital*, p. 12.

an incentive to seek a somewhat "safer" case – with lower risk and in later stages, which could also imply a risk of crowding out of private actions that would have been undertaken anyway. Isaksson's overview discusses a similar scenario in conjunction with lessons learned from Finland's Industri-investerings AB.

- On the other hand, is it a successful or unsuccessful outcome if the return is extremely low (perhaps even negative), if at the same time the requirement of no crowding out has been fully satisfied? Compare, for example, with the OECD, which suggests that too low a failure rate can in itself indicate low additionality.⁶¹
- How should the market-supplementary requirement be interpreted? Should funds refrain from follow-up investments in portfolio companies if the company develops well and an interest from commercial players has begun to appear? See, for example, the experience of the Scottish Co-investment Fund. The answer could be "Yes" from a market-supplemental point of view, but perhaps "No" from a return perspective.
- Which would be more desirable? That the action in itself generate growth in a number of companies, or that the regional risk-capital infrastructure supply take a step toward a longer-term improvement?

The above example deals with ambiguities in goal formulations and with risks for goal conflicts. Growth Analysis believes it is highly significant for both the implementation and for future evaluations that the goal structure be discussed and clarified as much as possible. Efforts in this regard that have commenced in the meetings held to date with the funds, Tillväxtverket, Growth Analysis and Ramböll are a highly favourable step in that direction and must continue.

4.4 The public sector and private players

One of the major challenges of the intervention is to find a balance between political and commercial aims. One of the aims of the public sector's involvement is to attract private capital for the long term, and convey an awareness of business opportunities they may not have noticed previously. Attractive investments shall be identified among portfolio companies, partly in early stages and partly (sometimes) those in geographic areas in which private risk capital market has not previously operated to any significant extent.

Experience from the Scotland Co-investment Fund, which is also partly financed by ERDF funds, indicate that the co-financing model *has* contributed to a development of local financing markets, particularly through business angel networks that have been able to scale up the size of their investments. Is it possible that a comparable development might take place in Sweden? This needs to be followed up.

The public sector offers shared risk and scaling-up of capital. However, the offer does not come without restrictions. Apart from the requirements of early stages and geographic location referred to above, a number of horizontal criteria are added. From the political side, the return level is but one of several goals, whereas it can be assumed to be entirely primary among private players. How is success for the one side that occurs at the expense of the other to be assessed?

Opportunities to further stimulate the participation of private players could be given through various incentive structures. Differentiated returns, levers consisting of government loan funds, differentiated investment timing and loss guarantees are the most

⁶¹ OECD, (1997), *Government Venture Capital for Technology-Based Firms*.

common. Properly designed examples suggesting that this could constitute attractive tools are presented in the knowledge survey. The Swedish action, however, involves no such designs.

Figuratively speaking, in this intervention the government and private risk capital are in the same boat. The relevant issues are the boat's locomotion and direction. Can the two row together effectively, simultaneously travelling in one direction that both are satisfied with? Murray and Lingelbach discuss this issue and have a clear opinion on goal prioritisation: *“The state’s social goals can only be reached by first achieving its partners’ commercial objectives.”*⁶²

4.5 Time perspective

As always in evaluation contexts there is a time dimension to be taken into account. Regarding risk capital supply there are at least two aspects that warrant comment. Firstly, Isaksson's research survey reveals a time lag in profitability for both VC funds and the portfolio companies. A time lag that is typically likened to a “J-curve”, where negative profitability is common in the initial stages. Effects of the investments become noticeable after a relatively long period. British experience indicates at least four to five years before the companies undergo a trend reversal, and recommends ideally up to ten years before portfolio companies' performance is evaluated.⁶³ Given that the Swedish action will not begin to be fully implemented until during 2010, any effect evaluation based on data from 2014 could be too early for the investments to have had an effect on the companies' performance. Such an evaluation involves the risk of showing too negative a picture of any growth effects on the portfolio companies.

The other aspect is industry-specific. Concerns have been expressed among the funds that investments in certain industries, such as life science, could be placed at a disadvantage because of a too short time perspective on the funds' lifespan. This (unintentional?) industry bias may require further investigation.

4.6 Growth and learning

Despite the challenges and questions discussed above, a final comment on the opportunities associated with the action is in order. In total, SEK 2.5 billion (c. 257 million euro) will be invested in growth-focused companies throughout Sweden. It will in all likelihood have effects on growth and employment. How large the effects will be and whether the outcome will offset the costs remains for the final analysis to show.

The potential for improvement in the regional risk capital supply infrastructure supply is another attractive possibility. Perhaps the public sector's participation could spark the interest of private players, help improve the information-sharing situation, stimulate contacts and interaction, and raise the level of expertise among market parties? Such a development would provide a long-term benefit that would far exceed the effects of the “treated” portfolio companies.

Finally – it must be acknowledged – the learning opportunities are good. The combination of the ongoing evaluation carried out by Tillväxtverket (through Ramböll as a procured evaluator), and Growth Analysis' own evaluation, could, assuming continuing clear role

⁶² Murray G & Lingelbach D, (2009), “Twelve meditations on venture capital”, p. 25.

⁶³ Nightingale et al, (2009), *From Funding Gaps to Thin Markets: UK Government Support for Early Stage Venture Capital*.

allocation, yield many interesting lessons. Promising cooperation has begun – between the parties performing the evaluation and with the funds. Dialogue and interaction characterised by openness, a desire to learn and a shared determination to ensure that the action in question is as effective as possible.

A cumulative endeavour is important for the design and implementation of effective policy measures. A large portion of today's knowledge of risk capital is based on American conditions, however. Clearly, Swedish experience is needed here, particularly considering the importance of context in the field. To quote Colin Mason:

“...the venture capital industry is dynamic and as it has matured it has become more heterogeneous. Research therefore needs to avoid extrapolating from what happens in Silicon Valley, or even the USA and to examine venture capital investing practices in different regions.”⁶⁴

The Swedish capital supply intervention and associated evaluations has the potential to contribute to this in many ways.

⁶⁴ Mason C, (2007), “Venture capital: A geographical perspective”, p.107.

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- stronger Swedish competitiveness and the establishment of conditions for job creation in more and growing companies
- development capacity throughout Sweden with stronger local and regional competitiveness, sustainable growth and sustainable regional development.

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- work with market awareness and policy intelligence and spread knowledge regarding trends and growth policy
- conduct analyses and evaluations that contribute to removing barriers to growth
- conduct system evaluations that facilitate prioritisation and efficiency enhancement of the emphasis and design of growth policy
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