



NTNU – Trondheim
Norwegian University of
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Policy design in practice: how 'premium' demand-side programs can bridge the financial gap

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Oppstartsdato 31. jan 2014	Innleveringsfrist 27. jun 2014
Oppgavens (foreløpige) tittel Policy design in practice: how 'premium' demand-side programs can bridge the financial gap	
Oppgavetekst/Problembeskrivelse How can demand-side initiatives successfully decrease information asymmetries and uncertainty, thus triggering more investments from private investors? How can demand-side initiatives successfully «pick winners» at such early stage of the firms life cycle? How are demand-side initiatives placed in the «value chain» of initiatives as a whole? What is the regional and national context surrounding and affecting the initiatives?	
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4. Underskrift

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Partene er gjort kjent med avtalens vilkår, samt kapitlene i studiehåndboken om generelle regler og aktuell studieplan for masterstudiet.

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3. Masteroppgave

Oppgavens (foreløpige) tittel Policy design in practice: how 'premium' demand-side programs can bridge the financial gap
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4. Bedømmelse

Kandidatene skal ha *individuell* bedømmelse
Kandidatene skal ha *felles* bedømmelse



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Policy design in practice: how ‘premium’ demand-side programs can bridge the financial gap

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Abstract. New potential high-growth firms, for example new technology-based ventures, represent the vast majority of economic growth and job creation caused by new firm creation. However, these firms often experience difficulties in raising a sufficient amount of capital, which justifies governmental intervention. We provide an overview of difficulties associated with the financing process of potential high-growth firms, and introduce a holistic, conceptual framework, illustrating the dynamics between supply-side and demand-side intervention in private capital markets. Furthermore, we study two demand-side programs that increase firm quality through value-adding activities provided by ‘industry professionals’. We examine how these programs (1) are able to ‘pick winners’ at such early stage of a firm life cycle, (2) ‘make winners’ through providing business support that reduces firm uncertainty, making them investor ready, and (3) ‘sell winners’ through reducing information asymmetries in the investment process and trigger investments from private equity investors. Based on our insights, we revise our framework and provide policy makers a conceptual model that can help them identify constraining factors and design schemes thereafter. We argue that governmental programs need to be designed in a ‘value chain’ of programs that address different stages in the life cycle of early stage companies. Furthermore, industry professionals need to be attracted and incentivized to participate in demand-side programs as they have the ability to identify and tackle crucial areas of firm uncertainty. Lastly, we argue that a significant amount of funding is necessary to produce significant contributions suggesting that policy makers should prioritize a small number of firms when designing programs with the purpose of fostering high-growth firms.

Sammendrag. Nye bedrifter med stort vekstpotensial står for brorparten av vår økonomiske vekst. Likevel opplever denne typen bedrifter ofte problemer med å tiltrekke seg nok tidligfasekapital, noe som kan rettferdiggjøre statlige inngrep for å øke kapitaltilførselen. I denne studien gis det et overblikk over utfordringene tilknyttet finansieringsprosessen av bedrifter med stort vekstpotensial. Det introduseres et holistisk, konseptuelt rammeverk som illustrerer dynamikken mellom ‘demand-side’ og supply-side’ i private kapitalmarkeder. Videre studeres det to demand-side-programmer som har som mål å øke bedrifters kvalitet gjennom verdiskapende aktiviteter tilført av ‘eksperter’ med lang bransje- og industrierfaring. Det studeres hvordan disse programmene (1) klarer å ‘plukke vinnere’ in en så tidlig fase i en bedrifts livssyklus, (2) ‘bygge vinnere’ gjennom tilførsel av forretningsutvikling som reduserer usikkerhet knytte til bedriften, derigjennom gjøre de ‘investor ready’, og (3) ‘selge vinnere’ ved å redusere informasjonsasymmetrier mellom entreprenører og investorer, derigjennom øke investeringsviljen- og aktiviteten i det private kapitalmarkedet. Basert på data fra denne studien revideres det initielle rammeverket. Resultatet er et verktøy som kan hjelpe politikere og andre policy-utformere med å identifisere utfordringer knyttet til utforming av nye tiltak. Det argumenteres for at statlige tiltak må settes opp i en ‘verdikjede’ av tiltak som retter seg mot og dekker ulike deler av en bedrifts livssyklus. Videre må eksperter med lang bransje- og industrierfaring, typisk tidligere serieentreprenører, tiltrekkes og bli gitt incentiver for å delta i demand-side programmer, nettopp fordi disse har evnen til å identifisere og takle avgjørende usikkerhetsområder i en bedrifts tidligfase. Det argumenteres for at signifikante mengder tilført kapital er nødvendig for å tilføre signifikante bidrag, noe som tyder på at politikere bør prioritere et mindre antall bedrifter og tilføre disse mer midler når programmer som spesifikt retter seg mot nye vekstbedrifter utformes.

Preface

This master thesis is the work of Henrik Tveit and Alexander Nietzold. The authors are currently pursuing their M.Sc. degree in Entrepreneurship at the Norwegian University of Science and Technology (NTNU), attending the NTNU School of Entrepreneurship. This thesis is based on research conducted in the period February – July 2014.

This thesis has been sponsored by SIVA - The Industrial Development Corporation of Norway. The purpose of this thesis is to draw lessons from two internationally renowned demand-side programs, however, to do so with extensive theoretical grounding. The authors believe that these types of ‘evaluations’ are too often conducted without any theoretical understanding of the problem, leading to a poor understanding of the underlying problems and challenges.

The authors hope and believe that the insights gained from this research can help policy and decision makers to gain a better understanding of the challenges related to designing demand-side programs, as well as a tool for making much needed change in Norwegian entrepreneurship policy.

We wish to thank our supervisor, Professor Roger Sørheim at the NTNU Department of Industrial Economics and Technology Management, for invaluable support, feedback and encouragement. Professor Sørheim has provided vital guidance throughout conducting this research, helping us shape our research and sharpen our objectives.

Trondheim, 20.06.2014



Alexander Nietzold



Henrik Tveit

Introduction

An OECD Economic report from 2014 notes that Norway may face the danger of the «Dutch disease» if the benefits from the petroleum industry were to diminish more rapidly than expected, and raise attention to entrepreneurship policy to maintain and improve Norwegian productivity performance. Enterprise creation is lower in Norway than in most OECD-countries. Furthermore, Norway has a below average rate of new companies that turn into high growth companies (OECD 2014), which are the ones that represent the vast contribution to job creation and economic growth (Shane 2009).

Firm growth rate is dependent on the financial capital of the firm, and young firms that make use of external financing grow significantly faster than those who don't (Carpenter & Petersen 2002b). The process of acquiring external funding is however often a significant challenge for entrepreneurs (Cressy & Olofsson 1997; MacMillan (1931) referred to in Frost 1954). Uncertainty and information asymmetries impede the financing process for new ventures (Sørheim et al. 2011), especially for New Technology Based Firms (NTBFs) with high growth ambitions (Lindstrom & Olofsson 2001; Murray 2007; Binks & Ennew 1996), causing what is commonly known as the financial gap.

When NTBFs with growth potential, which have the potential to produce considerable benefits for the domestic economy, face impediments raising the adequate amount of funding from private capital markets, a market failure is present and governmental intervention is justified (Lindstrom & Olofsson 2001; Shane 2009; Murray 2007; Cressy 2002). The low number of initial seed investments in Norwegian enterprises made by private equity firms, five in 2013 (NVCA 2014), indicate that these financing constraints are also present in Norway. Presuming this is true, more effective policies targeting market failure should be created.

Traditionally, most governmental funding schemes have addressed a lack of capital in the market (supply-side constraints), while other, relatively younger, initiatives address entrepreneurs' abilities to provide attractive investment opportunities (demand-side constraints) (Cressy & Olofsson 1997; Mason & Kwok 2010). Supply-side intervention can be useful when the pool of private capital available for investments is insufficient and there is a need to stimulate investors to make uncertain investments that they would not make with private money (Nightingale et al. 2009). However, fostering more high growth firms entirely through supply-side initiatives is not going to increase the actual quality of the firms. Without a steady stream of high potential, investment ready firms, the increased pool of capital is likely to be allocated to low quality firms (Armour & Cumming 2006). Lessons from the UK show that investors are unable to invest as much as they would like, meaning the amount of capital is sufficient (Mason & Harrison 2001). Many governments have acknowledged that the key issue for young companies is to gain access to the investors' readily available capital (Lundström & Stevenson 2005). However, the majority of academic research in the process of new venture financing has focused on supply-side measures (Rasmussen & Sørheim 2012b).

A well-known demand-side scheme that is a widely known tool for economic growth is the 'incubator' (Bergek & Norrman 2008), a term used for a range of organizations that differ in both concept and objective (Aernoudt 2004; Bøllingtoft & Ulhøi 2005). A strand of incubators within this umbrella term (Aernoudt 2004), is private for-profit incubators that provide financial and non-financial support in exchange for capital that they aim to capitalize on (Grimaldi & Grandi 2005). The activities of such incubators are quite well documented (Bergek & Norrman 2008), but it is argued that researchers need to turn their attention from 'what' the important activities are to 'how' and 'why' these activities are interrelated, as well as to focus on the incubation process and the incubatees involved (Hackett & Dilts 2004b). As some governments have developed programs that use private for-profit incubators as a tool for demand-side intervention to promote high growth firms, an understanding how these well-documented activities target the financial constraints for these firms is needed. Indeed, (Lundström & Stevenson 2005) argue that demand-side programs should apply a bottom-up approach, targeting the underlying deficiencies that represent their *raison d'être*.

Investors require companies to have reduced their uncertainty to a certain level, thereby becoming investor ready, before an investment is made (Douglas & Shepherd 2002; Dimov & Murray 2008). Information asymmetries make it difficult for them to distinguish the good firms from the less able firms (lemons) (Akerlof 1970). These are therefore issues that governmentally sponsored incubators should address. In addition, the same problems apply for the incubators when they select which companies to select for incubation. Identifying which companies should be supported in the very early stage is considered as a highly challenging task that even experienced investors fail at (Shane 2009; Mason & Brown 2013). Taken together, it is therefore appropriate to ask:

Q1 ‘Picking’ winners: *How can incubators, as demand-side initiatives, «pick winners» at such early stages of the firm’s life cycle?*

Q2 ‘Making’ winners: *How can incubators, as demand-side initiatives, reduce uncertainty related to new ventures, so that they become investor ready?*

Q3 ‘Selling’ winners: *How can incubators, as demand-side initiatives, reduce information asymmetries between new ventures and investors, thus increasing the investors perceived quality of the firm?*

We study two demand-side programs, the ‘Israeli Technological Incubator Program’ and the Finnish ‘VIGO Accelerator Program’, which report promising results by using private, for-profit, incubators to support promising high-growth firms. Through a multilevel study, including interviews with policy makers, incubator managers and portfolio companies, we assess how and why they work. Finally, implications for policy makers, investors, and Norwegian government agencies in particular, are provided.

Theory development

In order to successfully address the capital gap experienced by potential high-growth companies, it is crucial to understand the underlying problems leading to a market failure (Lundström & Stevenson 2005).

Information asymmetries

‘Information asymmetries’ is a term used for circumstances when there is a gap in information possessed by the demand side and the supply side. In the most obvious sense, entrepreneurs may be unaware of potential investors, and investors with available capital may be unaware of existing ventures that fit their investment profile (Hayton et al. 2008). Investors and entrepreneurs searching for and identifying each other may therefore incur significant transaction costs (Nightingale et al. 2009).

However, information asymmetries between entrepreneurs and investors are also hampering the financing process after a connection has been made. For example, an entrepreneur might be reluctant to reveal all information about a venture to investors, as it is the key to its competitive advantage (Shane & Cable 2002). Information asymmetries pose a line of issues for private investors (as well as for banks), which lead them to require a higher rate of return on the investments (Hall & Lerner 2009), partly leading to a higher cost of capital for the entrepreneurs (Carpenter & Petersen 2002a). Some issues can in a simple way be explained by the “lemons” problem:

Consider a simplified car market in which there are two types of cars: ‘Good cars’ and ‘bad cars’ (the latter known as “lemons”). When buying a car, the buyer might have an idea of whether the car is a good car or a lemon. However, after having bought the car, the owner gets a better idea of which category it belongs to. When selling the car to a new buyer, the seller will therefore have more information about the state of the car than the buyer. But since the buyer does not have the same information, the price of the car will be the same, regardless of it being a good car or a lemon. An owner of a lemon will more often than other car owners have a desire to sell the car to be able to buy a car that has a better probability of being good. With more lemons present in the market and with an equal price of good cars and lemons, owners of good cars cannot expect to get a price that reflects the real value of the car. They will be locked in, and lemons will drive the good cars out of the market (Akerlof 1970).

These information issues can also be applied to the investment process. As in the case of good cars and lemons, owners of ‘good ventures’ selling equity to investors compete with ‘lemon ventures’. It is a challenge to effectively assess investment opportunities, especially when the products and services do not yet exist and may even have complex characteristics that are hard to comprehend by both investors and end-users (Murray 2007). Entrepreneurs also have a predisposition to be overconfident and overestimate their likelihood of success (Koellinger et al. 2007). When an investor is presented to a viable venture, information asymmetries make it difficult for the investor to recognize it as a good venture instead of a lemon. Good ventures and seemingly similar lemons will be offered the same terms by the investors, leading the good ventures to pay a higher cost of capital than what their equity is worth. According to the lemons-problem, the good ventures will therefore not accept the high cost of capital when competing with lemons, and lemons will eventually dominate the marketplace.

In addition to the lemons-problem itself, the car market analogy also illustrates the adverse selection agency problems that emerge under information asymmetry. Adverse selection refers to difficulties in interpreting the abilities of an agent (Eisenhardt 1989a), in this case of an entrepreneur. The entrepreneur may claim to have abilities or experience that he or she not possesses to increase the probability of receiving investments, which makes it difficult for the investor to distinguish between able and less able entrepreneurs (Sahlman 1990). Furthermore, the entrepreneur can engage in opportunistic behavior by holding back information that can adversely affect the perceived attractiveness of the opportunity or the entrepreneur. Such opportunistic behavior increase the likelihood of receiving funding compared to other entrepreneurs (Shane & Cable 2002).

Another agency problem related to information asymmetries is the moral hazard problem, in which the goals of the principle and the agent are in conflict (Hall & Lerner 2009). The entrepreneur can decide to neglect his or her duties and partially divert the capital flow to private ends. In a more general sense, the entrepreneur might not put down the effort that is initially agreed upon and that is required for efficient application of the investment. Thus, the effectiveness of the invested capital is reduced (Bergemann & Hege 1998).

Risk and uncertainty

New venture financing also poses a variety of risks for the investor (and the entrepreneur): Managerial risk, technology risk, market risk and financial risk must be taken into account (Murray 2007). Entrepreneurial activities that search for opportunities to create and appropriate entrepreneurial rents also lead to investments in settings characterized by uncertainty (Alvarez 2007). An uncertain investment is unquantifiable, in the sense that the probability distributions and possible outcomes are unknown (Knight 1921 referred in Sørheim et al. 2011). Therefore, traditional portfolio theory and risk/reward assessment cannot be made, thereby making it rational for investors to not invest in an uncertain company (Dimov & Murray 2008). Indeed, increasing levels of uncertainty increase the cost of the investment for investors and reduce their willingness to invest (Sørheim et al. 2011), explaining the low number of seed investments compared to later stage investments made by Norwegian VC firms (NVCA 2014).

New Technology Based Firms (NTBFs)

Not all new entrepreneurial firms have a positive effect on the economy. In fact, a small portion of high growth ventures contributes to the vast majority of job creation and economic growth accounted for by entrepreneurial activity (Shane 2009). However, firms that expect to grow also perceive larger difficulties in obtaining external financing (Binks & Ennew 1996). New technology based firms (NTBFs) experience both larger financial constraints than firms with less novel technology, but also a significantly higher growth later on (Lindstrom & Olofsson 2001). High-tech investments involve greater uncertainty than low-tech investments, which as mentioned reduces investors' willingness to invest. The uncertainty is composed by the technological feasibility and whether there exists a market for the new technology (Murray & Marriott 1998). Furthermore, information asymmetries are larger when new technology is involved. New technology often involves new knowledge, which makes it more frequent that the entrepreneurs have more information about the firms' prospects compared to the investors. NTBFs are generally characterized by long and costly technical development (Murray 2007), which lead them to having a larger need for capital. The long technical development also makes it difficult and costly to signal the quality of the venture, therefore more difficult for good NTBFs to distinguish themselves from less able «lemon» firms. For example, investors prefer to see a well-working prototype, initial sales or other evidence of a market-need before they invest (Douglas & Shepherd 2002). To reach a stage, in which it is possible to provide investors with such signals, is both time-consuming and costly for NTBFs in their early days.

How investors deal with information asymmetries and uncertainty

The pecking order theory explains that new firms should prefer debt financing over equity financing (Myers & Majluf 1984), but as most financing for NTBFs are used for salary payments, which does not fulfill the collateral value that most banks require (Carpenter & Petersen 2002b; Hughes 1997). Furthermore, banks only take part in the downside risk and not the return, which make debt less applicable for NTBFs than equity financing (Cressy & Olofsson 1997; Paul et al. 2007).

Private investors issuing equity use a series of “tools” to deal with the problems of information and uncertainty that are present in the investment process. Investors can limit the information problem through due diligence of investment opportunities before making a deal, and monitoring of the company after a deal has been made (Lerner 2000). Investors also use social ties to acquire information that reduce agency problems and to identify opportunities (Shane & Cable 2002; Sørheim 2003). For NTBFs, due diligence becomes more difficult in areas concerning leading technologies as few, if any, people can validate the technology related to the opportunity. Furthermore, expert entrepreneurs in technological ventures are rarely equally competent in business, which imposes particularly high agency cost through management support and guidance (Murray & Marriott 1998).

Venture capitalist funds rely especially on tools to limit information asymmetries, such as thorough due diligence, deal negotiation and monitoring (Van Osnabrugge 2000). A venture capitalist often requires a seat on the investee firm's board of directors, and contract compensation schemes with managers, including incentivizing stock options, but also dilution schemes if the company fails to meet agreed upon targets (Gompers & Lerner 2001). When investing in NTBFs, the investors can expect that the investee firm will require follow on financing, increasing the total investments to portfolio firms. In addition, the great uncertainty related to new ventures results in a need for the investors to diversify their investment portfolio, aiming at one or a few major successes among several investments (Murray & Marriott 1998). Aggregating the tools to overcome information asymmetries, agency problems, risk and uncertainty, the total governance costs carried by venture capital firms is not only high, but also fixed, regardless of the size of the individual investment (Murray 2007). Early stage seed investments are therefore not only more uncertain than later stage investments, they also incur the same transaction costs, but with the disadvantage of a longer timespan to a potential divestment. Larger and more diversified portfolios allow VC firms to make a larger number of more risky seed investments, but only up to a certain scale as the governance cost of managing a larger portfolio exceed the expected return from the seed investments (Dimov & Murray 2008). Thus, it is a rational decision for VCs to mainly invest in later-stage companies.

Vcs reluctance to make smaller investments create resource difficulties for ventures in the very early stages; however, a different breed of investors are said to fill this gap: Business Angels are typically wealthy and well-educated individuals that invest their personal capital in new ventures (Feeney et al. 1999; Wetzel 1983; Mason 2007). They invest sums that are larger than what the entrepreneurs can raise from internal sources, but still smaller than the VC minimum investment threshold (Mason 2007). They do use similar evaluation criteria as VCs, but tend to use a less rigorous due diligence process and do not rely on contracting to the same extent as VCs (Van Osnabrugge 2000), thus reducing the high governance costs experienced by VCs to some extent. Well reputed Business Angels can also facilitate further financing, by making referrals to other business angels, VCs, or even banks (Sørheim 2005). However, they often prefer to stay anonymous, and leverage friend or business networks to identify investment opportunities (Wetzel 1983; Sørheim 2003). In comparison with venture capitalists, business angels are therefore less visible to both entrepreneurs and governments. Business Angels are able to invest at an earlier stage than VCs, but the information problems are significantly larger for the entrepreneur if the amount of Business Angels is limited.

Even though from the investors' point of view, it may be a rational decision to not invest in a firm because of large information asymmetries and uncertainty, the firm may have the potential to represent significant benefits for the domestic economy, and governmental intervention is justified (Murray 2007). Problems such as investors high-risk aversion and the tendency to prefer later-stage companies, exist independently of the companies, and are commonly labeled *supply-side constraints* (Cressy & Olofsson 1997). Governmental supply-side programs typically target these by investing as limited partners in funds, either 100% or co-investing with private actors. Some governments also provide guarantee schemes, buy-back options of governmental stocks or tax incentives to encourage investments from private actors (Wright et al. 2007). The rationale behind such schemes is to increase private investors' acceptance of risk and uncertainty in order to trigger investment that a rational investor not would do on its own.

How entrepreneurs can reduce information asymmetries

Entrepreneurs can also increase a private investor's willingness to invest by reducing the asymmetric information between themselves and investors. Investors rely on their direct and indirect ties to obtain information and advice about investment opportunities, which usually is information that is nonpublic and costly to obtain. For example, referrals through indirect ties provide information about competences, that is difficult for an investor to observe (Shane & Cable 2002). Furthermore, a third party can be a mediator of trust in the relationship between investors and entrepreneurs, especially if the third party has incentives to provide credible advice to the investor, thereby reducing the perceived danger of opportunism and moral hazard problems (Shane & Stuart 2002). Therefore, entrepreneurs need to develop their network and provide it with information about the investment opportunity their company represents. Indeed, the relationships and networks of the entrepreneur are of great importance when obtaining financing (Rasmussen & Sørheim 2012b).

Information asymmetries can also be reduced in other ways than through explicit information transfer in social ties. Good ventures can distinguish themselves from “lemon” ventures through signaling. For example, entrepreneurs can signal commitment and reduce the moral hazard problem, through firm ownership, in which the proportion of the entrepreneur’s wealth invested in the firm is positively correlated with perceived commitment (Busenitz et al. 2005). As the ability of an entrepreneur increases, its utility of an investment deal will increase by reducing the adverse selection problem through signaling. In contrast, less able entrepreneurs will not increase the utility of an investment deal. Signaling abilities is however contingent upon a sufficiently low cost of signaling, which can be high for technology-based ventures, in which a proof of concept or a first sale can be expensive milestones (Amit et al. 1990).

When information about a quality is too costly to obtain, Podolny (2010) claims that a possible exchange partner, such as an investor, will rely on the status of a company to make inferences about its quality. New ventures rarely have much of a track record to demonstrate, however, a company’s status can also be derived from the status of exchange partners (Podolny 1994). For example, a prominent organization can expect a loss of status if it is associated with a low quality new venture and therefore has an incentive to avoid such exchange partners. Furthermore, if there is a perceived correlation between prominence and evaluative abilities, which is likely to hold for equity investors, an affiliation to an exchange partner is in itself an endorsement to the new venture. These effects are larger when the uncertainty of the circumstances increase, in which affiliations have the capacity to substitute for track-record and experience (Stuart et al. 1999). Thus, entrepreneurs and new ventures, through their own achievements or via the status of exchange partners, can signal quality, thereby reducing agency problems that impede their resource acquisition.

Supply-side/Demand-side intervention framework

Despite the ‘tools’ that investors and entrepreneurs have to overcome the problems of information asymmetries and uncertainty, a financial gap may still exist, and governmental intervention may be justified. Supply-side intervention can be useful when the pool of private capital available for investment is insufficient, or when there is a need to stimulate investors to make investment that they would not make on their own.

However, fostering more high growth firms entirely through supply-side initiatives will come at an unfortunate cost. Without enough potential high growth firms, the increased pool of capital is likely to be allocated to lower quality ‘lemon’ firms, especially in the case of governmental funds in which investors are under pressure to “get the money out the door” (Mason & Kwok 2010). Furthermore, increasing the supply of investment without a corresponding increase in good firms result in greater competition between investors and diminished returns caused by bad investments, eventually leading the investors out of the market (Armour & Cumming 2006). Therefore, there needs to be a demand for financing from potential high growth firms, which would be the role of demand-side programs. Whereas private investors limited amount of capital is a supply-side constraint that is completely outside the control of the firm, demand-side constraints are consider as factors internal to the firm (Cressy & Olofsson 1997).

Figure 1 conceptualizes the financial gap and how it can be closed by either demand-side or supply-side intervention. In the very early stages of a new technology based firm, actors outside the firm, or even the entrepreneurs themselves, are unable to tell whether the venture will turn into a good, high-growth firm, or if it is a ‘lemon’. In this context, we define a lemon as a firm that does not have the potential to become a high growth firm, caused by a lack of unique product or shortage of an attractive market, or a combination of the two. The vast uncertainty and risk associated with NTBFs in the very early stage make it plausible to characterize it as a ‘question mark’. As the firm develops, the uncertainty is reduced and the firm becomes a more promising question mark, or one may determine the company to be a lemon. If the uncertainty is reduced to a certain level, illustrated in Figure 1 as the ‘financing benchmark’, the firm has become investor ready and private investors are willing to provide financing. The vertical position of the financing benchmark is influenced by various supply-side initiatives, such as tax incentives and hybrid-structured funds, which induce investors to tolerate more risks and uncertainty.

Demand-side programs give support to firms, both financially and non-financially, thereby reducing the uncertainty in the venture, which in turn “pushes” them towards the financing benchmark of investors and also makes it easier to distinguish between good firms and ‘lemons’. Thus, the financing gap can theoretically be closed both through supply-side and demand-side intervention. However, as with fostering high growth companies entirely through supply-side intervention, only focusing on producing more startups is unlikely to create considerable economic impact. The private equity market must therefore have enough financial and managerial strength to actually grow the potential high quality firms into high value assets (Nightingale et al. 2009).

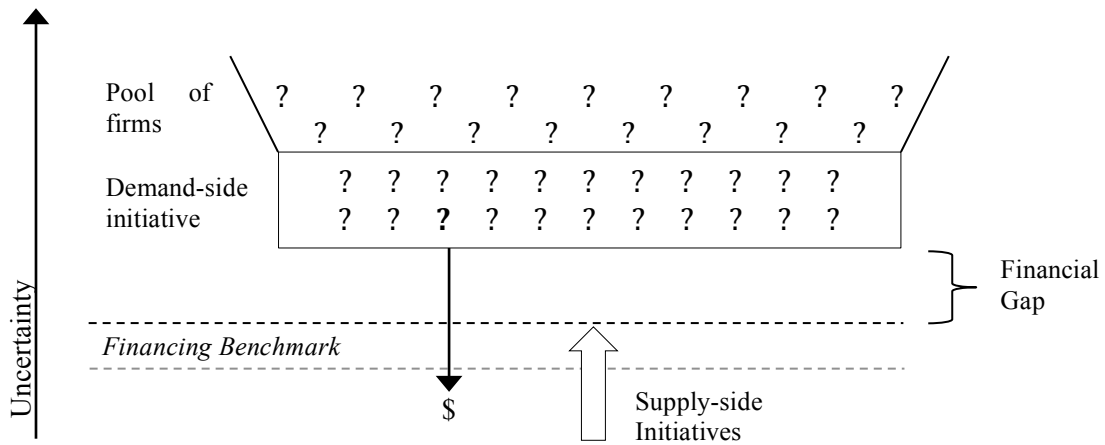


Figure 1: Relation between demand- and supply-side. Illustrating the 'financial gap'.

Demand-side schemes

Many governments have acknowledged that the main issue for young companies is to gain access to investors capital, not the availability or amount of capital itself (Lundström & Stevenson 2005). Prominent researchers have in recent years pointed towards how policy makers should specifically target high growth firms (Shane 2009; Lerner 2010; Mason & Brown 2013), implicitly drawing attention to demand-side programs as actors at the supply side per definition are concerned about growth potential. Designing demand-side programs is not a trivial task – something many efforts fail to succeed at (Lerner 2010; Lundström & Stevenson 2005). Before creating new demand-side programs, it is important to learn from programs that other governments have created (Mason & Harrison 2001). Although demand-side programs have become a more important policy focus in recent years, the majority of academic research on policy intervention in the process of financing of new technology-based ventures have emphasized supply-side programs (Rasmussen & Sørheim 2012b).

Grants

Demand side initiatives typically include early-stage grants to reduce initial technological uncertainty, such as developing a proof-of-concept, conducting market research or undergoing organizational development. Some schemes are targeted specifically towards university-based spinoffs, while others are of a more general nature. Funding mechanisms for the earliest stages of a company's development are usually 100% grant based, while funding schemes for later stages often involves some form of private co-funding (Rasmussen & Sørheim 2012a).

Investor readiness programs

In recent years so-called 'investment readiness programs' have started to emerge, often consisting of information seminars, workshops and networking events offered to entrepreneurs. The central objective of these programs is to raise the quality of investment opportunities through addressing issues such as equity aversion, investability and presentational failures. However, what is being delivered in these programs is rarely sufficient to get firms investment ready. This is because investment readiness is fundamentally about business development issues and requires company-specific input to identify and address barriers to investment (Mason & Kwok 2010).

Business incubators

Another demand-side scheme that attempts to increase actual firm quality is the 'incubator'. Policy makers have widely recognized incubators as a tool for economic growth and facilitating the emergence of new technology-based firms (Bergek & Norrman 2008). However, incubators differ significantly in both concept and objective (Aernoudt 2004; Bøllingtoft & Ulhøi 2005), thus the focus of our study is on those that target "weak-but-promising" firms and aim at increasing actual firm quality through 'value-adding intervention', sometimes referred to as 'business incubators' (Hackett & Dilts 2004a).

Together with the increase of high-tech and knowledge-based companies after the explosion of the internet, a new model of incubation emerged, in which access to knowledge and intangible assets have become increasingly important (Grimaldi & Grandi 2005). This type is typically a private, for-profit, seed capital incubator, meaning they support their tenants with financial and non-financial support in exchange for equity that they aim to capitalize on (Bøllingtoft & Ulhøi 2005). They can be set up and financially backed by both large corporations or by single individuals that invest their own money in the portfolio companies. These incubators are sometimes called 'accelerators', as they have the ability – and perhaps also an objective – to speed up the time to market through injections of capital and know-how (Grimaldi & Grandi 2005).

Bergek & Norrman (2008) have defined a framework of dimensions that distinguish different incubator models, regardless of being for-profit or non-profit. Dimensions include *business support*, meaning mentoring and consulting, *mediation*, referring to how incubators connect firms to the outside world (or to each other) and *selection*, meaning the entry criteria and selection process.

The content of the *business support* can be divided in administrative business matters, such as accounting and legal matters, and coaching or mentoring on business development. Instead of providing access to sources of technological or managerial expertise outside the incubator, private incubators often have such

knowledge in-house (Grimaldi & Grandi 2005). Another dimension of business support is how the support is provided: it can be provided as (1) episodic, entrepreneur-initiated counseling, (2) episodic, incubator-initiated counseling or in (3) a continuous, proactive manner (Rice 2002). An important distinction has to be made between whether the incubator (management) sees itself as the manager of the incubation process itself, or as a facilitator of a process that is primarily managed by the portfolio companies (Bergek & Norrman 2008). Private incubators are typically characterized by strong involvement in their portfolio companies, even from the early concept-definition phase.

Private incubators also tend to have a particular focus on creating strategic partnerships, with whom they *mediate* their portfolio companies with (Grimaldi & Grandi 2005). Incubators also typically provide network to potential customers, employees or other potential funding sources (Bøllingtoft & Ulhøi 2005).

Regarding the *selection* process, private incubators may apply a «picking the winners» strategy, in which the incubators aim to select a few promising companies post incubation, as opposed to a «survival of the fittest» approach, in which incubators accept quite many companies, and rely on markets to distinguish the winners from the losers. Incubators with strong selection typically have screening procedures that resemble those of venture capitalists (Bergek & Norrman 2008).

Venture capital and investor readiness

Traditional venture capitalists conduct a rigorous screening process with several stages that the companies must go through, including comprehensive due diligence (Fried & Hisrich 1994). Furthermore, they apply a risk/reward assessment of potential ideas, in which the market attractiveness and product differentiation are proxies for expected return, while managerial capabilities and environmental threats are factors that represent perceived risk (Tyebjee & Bruno 1984).

Douglas & Shepherd (2002) use the term “investor readiness” to explain venture capitalists assessment of investment opportunities. It is defined as *the ability to attract significant external investor funding from Business Angels and/or venture capital funds*. Investor readiness is decomposed to market readiness, technology readiness and management readiness.

- *Technology readiness* refers to whether the technology actually works, if a prototype has been built and successfully tested, if the new product or service can be mass-produced at a cost that enables a significant profit, and if the venture has sufficient intellectual property.
- *Market readiness* refers to whether the concept has been tested towards the customers and a demand for the product or service is proven. Ideally, initial sales signal market readiness, but significant market research can also reduce the market risk.
- *Management readiness* refers to whether the management team has relevant experience, which often includes experience from management, start-ups, and related industries and technologies.

The above is by Mason & Harrison (2001) considered as the “investability” of the venture and argues that this is the most important aspect of becoming investor ready. However, they also address two other aspects. The first is the owner’s attitude towards external equity financing; giving away equity implies less ownership and control of the company. Information asymmetries increase the cost of capital, leading the owners of a firm to give away more equity. The second aspect is the presentational skills of the entrepreneurs when presenting the business case to the investors through business plans or oral presentations at investor forums (Mason & Harrison 2001).

To be perceived as an attractive investment opportunity for venture capitalists, the venture must be “ready” along all dimensions of technology, market and management (Douglas & Shepherd 2002). Indeed, many of the most promising investment opportunities are rejected because of a single fundamental “flaw” (Mason et al. 1996), meaning ‘almost ready’ is still not sufficient. Investors can require that obvious flaws are “corrected” before an investment is made, such as the appointment of a new CEO to correct management deficiencies (Douglas & Shepherd 2002).

Research questions

It is argued that much of the incubator research fails to move beyond “*long lists of critical success factors*” and that research must turn attention from ‘what’ to ‘how’ and ‘why’, and ‘in what context’ these factors are interrelated. Furthermore, while the physical incubator facilities are well covered in research, more attention is needed on the incubation process and the incubatees involved (Hackett & Dilts 2004b). As some governments use incubators as a tool for demand-side intervention to promote high growth firms, there is a need to understand how these well documented activities target the market failure leading to financial constraints for these firms. Indeed, Lundström & Stevenson (2005) argue that demand-side programs should apply a bottom-up approach, addressing the underlying deficiencies leading to a market failure by isolating the problems experienced by the firms and design schemes that target these specific problems. Theoretically, uncertainty related to companies and information asymmetries between companies and investors are hampering the investment process, making it irrational for private investors to invest in the early stages. Thus, incubators, used by governments for demand-side intervention, should address information asymmetries and uncertainty in order to improve the financing problems for the firms it supports.

Identifying which companies to support at an early stage, the stage in which governments usually intervene, is recognized as a highly challenging task – something that even experienced investors fail at (Shane 2009; Mason & Brown 2013). Incubators need to be able to select the firms that are promising, but weak due to a lack of resources, and distinguish them from the ones that do not need or cannot be helped through support programs (Hackett & Dilts 2004b). These incubators are therefore in the same position as other private investors, as high uncertainty and information asymmetries make it difficult to distinguish these firms from other ‘lemon’ firms. Therefore, it is appropriate to ask:

Q1 ‘Picking’ winners: *How can incubators, as demand-side initiatives, «pick winners» at such early stages of the firm’s life cycle?*

Incubators with the aim of creating high growth firms will need to develop them to become ‘investor ready’. This implies reducing the uncertainty of their portfolio companies to a level in which investors perceive them as having a sufficient level of market readiness, management readiness and technology readiness. Incubator activities are quite well documented, but how these are associated with reducing company uncertainty is not. Hence the following research question:

Q2 ‘Making’ winners: *How can incubators, as demand-side initiatives, reduce uncertainty related to new ventures, so that they become investor ready?*

In addition to reducing its inherent uncertainty to a level that private investors can accept, a company must also be perceived as an attractive investment opportunity in the eyes of investors. A company can signal quality through its own achievements or through affiliations with other organizations, such as an incubator. At the same time, an incubator will have more information about the quality of its portfolio companies than other investors, making the lemons problem applicable for the incubator-investor relationship. Therefore, it is appropriate to ask:

Q3 ‘Selling’ winners: *How can incubators, as demand-side initiatives, reduce information asymmetries between new ventures and investors, thus increasing the investors perceived quality of the firm?*

Methodology

Theory-building case study research design

The objective of our research is both to try to explain the causal links between how activities in incubator demand-side programs manage to reduce uncertainty and information asymmetries, but also to explore how they manage to select the promising firms. Due to the both explanatory and exploratory nature of the research questions, a qualitative approach was chosen for the study (Yin 2009). Little research has been conducted on demand-side initiatives (Rasmussen & Sørheim 2012b), which makes a qualitative approach capable to make a significant contribution to theory development (Eisenhardt 1989b). In this research, a multiple case study of two demand-side programs was chosen. A multilevel approach was applied to each case, which included several interview subjects that covered different roles and relations to the programs.

The first research question (Q1) was approached with an exploratory strategy: since incubators select companies at a much different stage than venture capitalists, the authors looked for dimensions in investment-decisions that differed from traditional theory on venture capital decision making (Tyebjee & Bruno 1984; Douglas & Shepherd 2002). For the other two research questions (Q2) and (Q3), the authors relied on existing theory on market deficiencies and incubator activities to specify variables, without considering the relations between them (Eisenhardt 1989b).

Theory development

Developing a conceptual model of how governments can bridge the financial gap required the authors to get a grasp on a broad range of existing theory, both to identify research questions and to compare with emerging concepts from the study (Yin 2009; Eisenhardt 1989b). The authors started out by examining grand theory (Bryman 2008) to understand the concepts of market failure (information asymmetries and uncertainty) in new venture financing. Based on this understanding, the authors developed an initial conceptual model of the capital gap, illustrating how it may be bridged in different ways. The focus was thereafter narrowed down to demand-side programs, where middle-range theory (Bryman 2008) on various governmental demand side intervention mechanisms was examined. Finally, research questions were created to explain and explore the connections between demand-side programs and the market deficiencies that essentially provide the purpose for the programs existence.

Case Selection

Given the limited number of cases available, two cases that claim to have promising results were chosen. The governments in Israel and Finland have created programs targeting potentially good firms that are unable to get financing from private investors (Wylie 2011; Autio et al. 2013), and both programs engage private, for-profit incubators, to target potential high-growth firms. As advised by (Eisenhardt 1989b), the case selection is not random, but driven by theory.

Multi-level Data Collection¹

The program as a whole is considered as the unit of analysis. However, the study is an embedded case (Yin 2009), in which data is extracted from various sources and interviews are conducted with people with different roles in or relations to the program: we used a *multilevel* approach, interviewing government officials, incubator/accelerator managers and CEOs of participating companies, thereby being able to reveal inconsistencies between purpose and reality. Thus, the risk of interview bias affecting the results is reduced (Yin 2009), which would have been more likely if for example only program management had been interviewed. Many previous studies of demand- and/or supply-side intervention tend to collect data solely from program managers, thus creating a risk to miss out on important nuances, therefore not being able to perceive and describe the 'authentic picture'. Consequently, it was important to take a multi-level approach in this study.

¹ In total these interviews lasted 13 hours and 10 minutes and all interviews except one were tape recorded and transcribed. The transcriptions totaled 186 single spaced pages and just above 86,000 words.

Interviews

Three interview guides were created, one for the program management, one for incubator management, and one for company CEOs. The interview guides were based on the authors' knowledge from literature reviews as well as available documentation (reports, evaluations and presentations).

Case 1. The Israeli Technological Incubator Program

	<i>Interviewee</i>	<i>Industry</i>	<i>Time in program</i>
Program Management	Program Manager	Governmental	4 years
Incubator Management 1	CEO+VP	Lifescience	7 Years
Incubator Management 2	CEO	Medical	7 Years
Incubator Management 3	COO	Cleanweb	3 Months
Company 1	CEO	Lifescience	1.5 Years
Company 2	CEO	Lifescience	1.5 Years
Company 3	CEO	Lifescience	3 Years
Company 4	CEO	Medical	1.5 Years
Company 5	CEO	Medical	1.5 Years
Company 6	CEO	Medical	1 Year
Company 7	CEO	Cleanweb	3 Months

Case 2. The Finnish Vigo Accelerator Program

	<i>Interviewee</i>	<i>Industry</i>	<i>Time in program</i>
Program Management	Profict	Private	3 Years
Program Management	TEM	Governmental	4 Years
Program Management	TEKES	Governmental	4 Years
Program Management	Finnvera	Governmental	4 Years
Incubator Management 1	CEO	Software	2 Years
Incubator Management 2	CEO	Software	4 Years
Company 1	CEO	Software	Exit
Company 2	CEO	Software	1.5 Years
Company 3	CEO	Software	0.5 Years
Company 4	CEO	Software	2 Years

Data analysis

The authors employed an iterative process to determine the final categories in which the data was analyzed after. First, the authors 'played' with the data, by organizing quotes in a spreadsheet based on both theoretical solutions to uncertainty and information problems, and activities performed in incubators. The data was thereby reorganized into categories that were closely related to the research questions. Working with the data in this manner helped the authors to become intimately familiar with the data and to be able to make useful causal connections (Eisenhardt 1989b; Yin 2009). After arriving at an initial set of categories for data coding, it was compared with theory and then revised. The final categories for data coding are provided below.

Data coding		
Q1: Picking winners	Q2: Making winners	Q3: Selling winners
<ul style="list-style-type: none"> Investment criteria Timing and fit 	<ul style="list-style-type: none"> Approach to support Reducing technology uncertainty Reducing market uncertainty Reducing management uncertainty Focus 	<ul style="list-style-type: none"> Establishing information flow Improving information flow Transferring information about quality

Each case was independently analyzed as described above, before performing a cross-case analysis (Eisenhardt 1989b; Yin 2009), searching for patterns based on the findings in the individual analysis. Findings from each of the cases were put in tables to highlight similarities and differences, from which theoretical considerations were derived.

Transferability considerations

To be able to increase the transferability of the results, the authors strived to apply replication logic to the investigation of the two cases (Yin 2009). Thus, due to logistic issues, it was not possible to have interview subjects with the same set of roles in the two programs. However, all roles were filled in both investigations, but the amount of subjects at each level differed (program management, incubator management and company CEOs).

The context in which the programs are implemented is also not completely replicated between the programs. Indeed, contextual aspects can make it inappropriate to transfer 'good practice' policy measures from one country to another (Lundström & Stevenson 2005). However, it can be argued that similar observations in programs that are implemented in different environments makes the context, as a rival explanation (Yin 2009), less accountable for the observed results. Therefore, the authors argue that the provided results can be universal for a wider range of contexts than those of the two cases in this study. Still, even though in-depth contextual investigations are not performed in study, some considerations of contextual similarities and differences are provided for policy makers to make their own assessments on whether findings in this study can be replicated elsewhere.

Data Analysis

Case 1 – The Israeli Technological Incubators Program (TIP)

Case description

Rational and purpose

The Israeli Technological Incubator Program (TIP) is a governmental response to a ‘market failure’. The program was introduced by the Office of the Chief Scientist in the Ministry of Industry and Trade in 1991, as an effort to employ high-educated Soviet immigrants and hundreds of laid-off engineers from the Israeli military industry. Prior to the incubator program, policies had emphasized R&D and it was clear that the government needed to enhance start-up formation and growth. Governmental efforts to promote entrepreneurial high-tech activity was initiated through the incubator program alongside policies developing the VC-industry (Yozma program) (Avnimelech et al. 2007). The incubators were originally run by municipalities and academic institutions, but the program management realized that such shareholders lacked the commercial orientation to provide sufficient value to the portfolio companies. Between 2002 and 2010, all incubators were privatized, and are now owned by private actors such as private investors, high-tech companies or multinational corporations (Interview Program Manager 2014).

The program has evolved since its origin as the characteristics of the market failure have changed. The present market failure is that Israeli early-stage, high-risk, innovative, technological enterprises fail to raise money from the private sector. The main objective of the program is to create new startups that would not have been started otherwise. The idea is to provide funding and support activities through specialized incubators to these high-risk firms. Through this, the firms are developed over a 2-year period with the ultimate goal being to lead them towards private equity investments at the end of the period.

Governmental subsidizing

The privately owned incubators invest in their portfolio companies from their own pockets when admitting a company to their incubator, and receive 30-50% equity in return. The revenue model of the incubators is based on divesting their equity at a higher value through an exit. Every company has a budget for the incubation period: the government will grant 85% of the budget, whereas the incubator’s investment represents the remaining 15%. The budget for most projects is 0.5 million USD, while budgets of up to 0.7 million USD can be approved for projects in industries that are characterized by higher risk and more costly development, such as clean-tech or life sciences. The grant is given directly to the companies, but must be paid back after the company has started to generate revenues, through royalties of 3% per year until the full amount is paid back (Interview Program Manager 2014).

The program has an annual budget of 50 million USD, which is distributed to companies in 20 different incubators. From 1991 to 2012, the Israeli government spent 690 million USD on the Technology Incubators Program. The portfolio companies of the program have during the same period attracted 3.5 billion USD from private investors. Thus, each governmental dollar spent has triggered five private dollars in portfolio company investments (Interview Program Manager 2014).

Incubator activities

All incubators provide a similar set of services. The incubators provide office space and infrastructure for R&D such as labs that the companies can use when developing their product (Smoler 2010). The size of the incubator staff usually counts between 8-10 people, providing both administrative services such as accounting and legal services, but also business mentoring and technical assistance. The management of the incubators normally has industry experience, such as from starting companies, raising money or working as private equity investors. Both the shareholders and management of the incubators provide a network of potential customers, partners and investors to the portfolio companies (Interview Program Manager 2014). The incubators can charge a monthly sum for overhead costs, for which the OCS has set an upper limit. However, according to an incubator manager, this does not fully cover their monthly

expenses. Thus, increasing the value of the portfolio companies is the only way the incubator can profit from their activities (Interview Incubator CEO 2014b).

Tender

To receive a license to run an incubator in the Technological Incubators Program, the shareholders need to participate in a competitive tender process controlled by the Office of the Chief Scientist. If approved, the shareholders receive a license to run an incubator for eight years, in which they can compete in a new tender process for a new license in their seventh year. The licensee model was recently changed from three years licenses to eight years licenses, as a three-year period was too short to evaluate the performance of a high-risk incubator (Interview Program Manager 2014). As of today, the main criteria that are evaluated are the proposed managements' ability to add value to the portfolio companies, financial strength to make post-incubation follow-on investments, and an ability to support companies to penetrate outside markets. Some multinational corporations have therefore received licenses to run an incubator, and The Office of Chief Scientist is welcoming more to compete. In 2014, large corporations such as GE, Phillips and Microsoft were planning to participate in the tender process (Weinreb & Shelach 2014).

Screening of portfolio companies

The technological incubators program has a thorough and competitive screening process, in which only 5% of those who approach the incubators are approved for incubation. The selection process involves both the incubator and the Office of the Chief Scientist, however incubators conduct the majority of the screening. The incubators make recommendations of which companies they would like to approve, and the Office of the Chief Scientist controls that the recommendations are aligned with the purpose of the program.

Case 1. 'Picking winners'

Approximately 200-250 projects are screened per year at each incubator. The screening process, as described by one of the incubators, starts by a short assessment of the technology, market and whether the incubator can add value to the company. This is followed by a brainstorming session with the incubator team to outline a likely development process of the company. The next step is a more thorough due diligence, in which the team puts down efforts to understand the technology, the need for the product, market issues and financials, as well as obtaining opinions from experts in the respective field. Then the gaps and risks that should be addressed through the incubation are identified. This is translated into a two-year work plan and presented to the investor committee, which consists of the founders and management team of the incubator (Interview Incubator VP 2014). The recommendations of the incubator investment committee are sent to the Office of the Chief Scientist, which nominates an expert from a pool of experts to perform due diligence and write a report to the program manager of the incubator program. Then the incubator presents the projects in front of the “technological incubator committee”, which includes representatives from the government, investors and industry experts from a variety of fields. This committee takes the final decision on whether to accept or reject the project (Interview Program Manager 2014).

Investment criteria	<p>The incubator managements are looking for investment opportunities that represent a significant potential return: the market must be large and business ideas should have the potential to disrupt existing solutions.</p> <p><i>«We are looking for game changers; and we're willing to take a risk.» (Incubator VP)</i></p> <p>The incubator managers indicated that they require a (theoretical) proof of concept for the technology. The incubators use personnel with technological experience to verify that the technology 'makes sense'.</p> <p><i>«We wouldn't invest in a company that would come to us without a proof of concept, but then again – a proof of concept can be theoretical proof of concept.» (Incubator COO)</i></p> <p><i>«The screening process usually starts by our CTOs just because he's seen so many technologies, just to understand whether the technology makes sense, because we invest in technologies.» (Incubator CEO)</i></p> <p>Companies with even less developed technology may be accepted if the team appears to be experienced.</p> <p><i>«We know the market of orthopedic surgery very well. We know the market gaps, because we've done this for 20 years. We came here with just an idea of a solution to one of the gaps.» (Company CEO)</i></p> <p>In general, the management team is considered an important element when selecting companies, but not a prerequisite. The incubators can recruit new management to supplement or replace the existing team.</p> <p><i>«We have had one or two cases where we said that we can take the project, but you're not a good fit to be the CEO.» (Incubator CEO)</i></p> <p><i>«We want the cardiologist to be a cardiologist. We will recruit someone new to run the project, it's pretty easy to do so as well.» (Incubator CEO)</i></p>
Timing and fit	<p>The incubator management needs to see if the company has the potential to raise money post-incubation. They 'plan backwards' to see if this goal is reachable during incubation. This 'timing factor' seems to be more important than the actual company life cycle stage.</p> <p><i>«After 18 months they should be at the point where they can really pitch their startups to investors for an A-round.» (Incubator CEO)</i></p> <p><i>«Sometimes, you could have a very early stage technology, but with the right scientific basis to reach that fundable milestone within 18 months, the project could be eligible for incubation. For other projects you could be beyond proof of concepts but the path to your milestone is so long... you could not incubate such a company in this kind of structure because it requires too much.» (Incubator VP).</i></p> <p><i>«We sometimes tell them that there are three big unknowns, three big questions... So go back to the lab, try to get some governmental funding maybe, to answer one of those questions. Maybe we can provide some funding to help answer another of those questions, even in a pre-clinical model before incubation, and then we know what one big question we have for incubation. And that's acceptable.» (Incubator VP)</i></p> <p>The incubators emphasize that they need to have the right competencies to increase the value of the company.</p> <p><i>«We decide whether we have an added value for the project or not.» (Incubator VP)</i></p>

Case 1. ‘Making winners’ through reducing uncertainty

The incubator management provided hands-on support and indicated that they spend a lot of time supporting the companies. The support appears to be of a consulting nature, in which the entrepreneurs approach the incubator management for advice, but there are also regular meetings with the incubator staff.

«We really do provide hands-on managerial support. Even the CEO himself will walk down this corridor and visit the project leaders on a daily basis, talking about their concerns and milestones.» (Incubator VP)

«We have meetings, but we also interact with the companies via telephone and in the corridor, and we try to build the interaction to mostly consist of informal meetings.» (Incubator CEO)

Reducing technology uncertainty	<p>The incubator management had technical competence in-house, which provided technical guidance to the companies on a daily basis. (At least) two of the incubators also had in-house labs for R&D.</p> <p><i>«We have a CTO that works with the companies to see that we’re on track and that they make reasonable technical decisions.» (Incubator CEO)</i></p> <p><i>«The CTO here can build everything in terms of technology, so when they need help to build something he is here for that. They can consult with him on daily basis.» (Incubator CEO)</i></p>
Reducing market uncertainty	<p>The incubators provide know-how on how their portfolio companies should approach and interact with market stakeholders, as well as market specific information. They utilize their network to connect companies with information providers or possible strategic partners.</p> <p><i>«They can get all the insight they need about establishing strategic partnerships, doing contracts, revising the business model, how to approach potential clients, partners, etc.» (Incubator COO)</i></p> <p><i>«We provide our experience, our insight, our connections... So if he needs to be connected to someone overseas, to establish partnerships [...] He gets all our connections, that’s our aim.» (Incubator COO)</i></p> <p><i>«We could support with industry specific services related to such as regulation, Q&A... So we have people that specialize in this area.» (Incubator CEO)</i></p>
Reducing management uncertainty	<p>In many cases, there was a strong presence of experienced management teams in the portfolio companies.</p> <p><i>«It’s not people who we think we will need to extensively ‘train’. You need to have the potential already when you start.» (Incubator CEO)</i></p> <p>The incubators were somewhat strengthening the management of the portfolio through coaching activities.</p> <p><i>«I came with management skills, so I think I know what I should do. Of course I always listen to advice from the incubator management. However, every-day decisions are made internally, while I may ask for advice when facing more complicated issues.» (Company CEO)</i></p> <p>However, adding and/or replacing members seem to be a more significant contribution to the quality of the management team.</p> <p><i>«We want the cardiologist to be a cardiologist. We will recruit someone new to run the project, it’s pretty easy to do so as well.» (Incubator CEO)</i></p>
Focus	<p>Through providing a wide range of professional ‘administrative’ services, the companies are able to focus on developing their businesses.</p> <p><i>«We provide an ‘umbrella’ of professional services. Book keeping, legal, and so forth. To really have our project leaders focus on their tasks whether it’d be in the beginning of product development or the beginning of business development.» (Incubator CEO)</i></p> <p><i>«I have the opportunity to focus on the technology, on the work itself, on the engineering and moving forward, and less with bureaucratic things.» (Company CEO)</i></p>

Not all portfolio companies reported that they used the available support as extensively as they could. Companies in different incubators indicated that they had the necessary experience to develop and grow companies, more so than they believed other companies had. As described by one of the portfolio companies: «We don't need the coaching they provide some of the teams, because we've been launching projects every year for 20 years. So we know our way». Other, less experienced teams, reported that they first and foremost perceived the incubator as an investor in their company, secondly as a mean for non-financial support.

Case 1. 'Selling winners' by reducing information asymmetries

The incubators had a somewhat different approach to how they supported the firms in the fundraising process towards the end of the incubation period. Two of the incubators provided follow-on financing to promising portfolio companies post-incubation, either from a traditional venture-fund or from a parent company. However, they preferred to syndicate with other private investors, in which they took the role as lead investor. The last incubator in the case study did not provide follow-on financing, and put more emphasis on their role in fundraising process of their portfolio companies.

Establishing information flow	<p>The incubator connects their portfolio companies with investors. Investors approach incubators to identify new opportunities and the incubator management proactively approach investors on behalf of their portfolio companies.</p> <p>«Often, investors approach us to get company introductions [...] and we're also very proactive, we go to investors, I talk to them, I talk with every VC in Israel.» (Incubator CEO)</p> <p>«One of our current investors was introduced by the guys from this incubator.» (Company CEO)</p> <p>«We had a road show in the United States that brought me some of the investors. I got very significant assistance.» (Company CEO)</p> <p>«They are very, very helpful to engage you with potential investors.» (Company CEO)</p>
Improving information flow	<p>The incubator staff was involved in preparing investor presentations.</p> <p>«We are helping the companies with building their investor presentations.» (Incubator CEO)</p> <p>«They helped me by arranging the Power Point presentation.» (Company CEO)</p>
Transferring information about quality	<p>The reputation of one of the incubators was emphasized by both the incubator management and company CEOs.</p> <p>«I think in terms of the medical devices we're one of the prominent investors in early stage in Israel... in medical devices we are pretty good name internationally.» (Incubator CEO)</p> <p>«The reputation that [the incubator] has in Israel is very, very high.» (Company CEO)</p> <p>Incubators appear to be a trusted source of information about investment opportunities to investors.</p> <p>«The investors trust us. They know that if we say it's a good company, it's a good company.» (Incubator CEO)</p> <p>The same incubator manager could easily connect its companies to VCs.</p> <p>«I can get a meeting for any company to any VC in Israel.» (Incubator CEO)</p> <p>There were indications that incubator support and 'robustness' could increase the investors' confidence of the project's viability.</p> <p>«It shows the investor that it is part of a bigger organization. Even from a very simple perspective of having a CFO so people know that the money is managed in a proper way. It gives the company an added value that would be very hard for the company to achieve on its own.» (Incubator CEO)</p>

Case 2 – The Finnish VIGO Accelerator Program

Case description

Rational

Traditionally, Finland is internationally renowned for being one of the most successful innovation economies with one of the highest R&D-investments per capita in the world. Despite this, a joint evaluation by the public sector and venture capital industry in 2007 revealed that the country was producing very few international high growth firms. Public sector funding, including the existing incubator system, were wasting too much resources to “lifestyle” companies (i.e. firms without growth ambitions), thus creating a large number of companies with inadequate resources for growth. Existing incubators were a component in real estate management, in which real estate companies were subsidized to build facilities with incubators, and were therefore incentivized to increase the number of tenants (Ruohonen & Oy 2007; Interview TEM 2014). For a long time, the majority of governmental funding was supporting the venture capital market, however it became clear that the main issue for the venture capitalists was the quality of the startups, not the amount of available capital (Interview TEM 2014). The competence base in the high-growth ecosystem was also insufficient due to a lack of serial entrepreneurs and managers with international business experience that were willing to engage in startup activities (Ruohonen & Oy 2007). Instead of modifying existing programs, the VIGO accelerator program was launched in 2009 to target these perceived gaps (Autio et al. 2013).

Government intervention

The VIGO program is set to last for a six-year period, through which the government is facilitating the creation of business accelerators. The accelerators are private companies consisting of 3-5 people with experience as serial entrepreneurs, VC-investors or large-firm managers with international experience. They raise and invest their own funds (as well as the ones of other private investors) for an equity stake in very early stage companies. Thus, their main revenue model is based on the growth of company valuations towards an exit.

The government launched a number of mechanisms to facilitate the emergence of the accelerators:

- A private company was hired by the government to coordinate the program, which put together principles and guides for the accelerators and do PR activities to create brand-awareness around the VIGO program (Interview Program Coordinator 2014).
- VIGO portfolio companies receive preferred treatment and brand acceptance by Tekes and Finnvera, which are public institutions providing grants and equity investments, loans and guarantees respectively (Autio et al. 2013). Within Tekes, each accelerator has a ‘key account manager’ that provides hands-on advice on how to secure governmental funding and who strive to provide a faster application process than for non-VIGO applicants (Interview TEKES 2014).
- Management fees as compensation for services provided by the accelerator management are eligible costs for the Tekes grants. An agreement between the accelerator and portfolio company is required, in which the maximum management fee is 9000 EUR per company per month. However, this incentive mechanism is disputed as it entails certain agency problems (Autio et al. 2013). As of today, approximately half of the accelerators do not collect any fees, while those who do collect significantly less than the upper limit (Interview Program Coordinator 2014).

Activities

The accelerator itself must invest a minimum of 30,000 EUR in a portfolio company, besides that, there are few, if any, restrictions from the government or the program coordinator on how the accelerator should operate or in what kind of companies they should invest in. In fact, there is no formal contract between the government or project coordinator and the accelerators. Having the VIGO brand represent a certain ‘way of doing things’, and may be withdrawn if operations differ adversely from the intention of the program coordinator (Interview Program Coordinator 2014).

The accelerator teams typically consist of 2-4 partners. In terms of the degree of ‘hands-on’ support, there is clear variation in how the accelerators support their portfolio firms. Some accelerators diverge towards effectively being a venture capital fund, raising money from external parties and investing in very early stage companies. Others are more involved, providing managerial services such as fundraising and networking, whereas some are heavily involved on the operational side, even taking a management role in the portfolio companies (Autio et al. 2013). There is however no indication that accelerators converge to one model or another, nor is this an ambition of the program coordinator. Regardless the model of operation, the accelerators are supposed to make a distinct contribution in the companies over the course of about two years (Interview Program Coordinator 2014). This primarily translates into developing startups that receive an A-round investment (>2 million EUR) from a professional investor (Interview TEM 2014). However, there is no clearly defined acceleration period. The project coordinator encourages accelerators to give intensive support for as long as needed, which can last between six months and two years, and take a less active role as the companies move forward (Interview Program Coordinator 2014).

Interlinkage with public funding sources

No new public funds were set up in relation to the VIGO-program. It was designed to utilize existing funding mechanisms that already were in place (Interview Program Coordinator 2014). One year before VIGO was launched, Tekes established a new fund called “Funding for Young Innovative Growth Companies” (YIC) (Tillvaxanalys 2011), targeting the most promising startups that are set for international growth. The fund grants a maximum of 1 million EUR, covering 75% of eligible costs, and is granted in stages based on milestones (Maijanen 2014). In addition, Tekes provides R&D support consisting of a mix of grants and loans.

For the YIC grant, Tekes has a comprehensive screening process, in which the international growth potential is emphasized: (1) a proficient team or a clear plan on how this shall be acquired should be in place, (2) the market size should be above 100 million EUR unless it is a niche market, and (3) the technology or product should be somewhat ready to scale. To be able to identify the most promising firms, Tekes has recruited a pool of experts, typically from the venture capital industry, that provides input and advise on whether the companies are eligible for funding or not (Interview TEKES 2014).

All though the same official entry criteria and procedures count for VIGO companies, they enjoy a ‘fast track’ to governmental funding through speedy handling of applications. Furthermore, every VIGO accelerator has a designated ‘Tekes contact advisor’, available at any time to offer hands-on advise on Tekes funding. It is also acknowledged that VIGO firms enjoy a ‘mark of quality’ within Tekes (Interview TEKES 2014). Between 2009 and 2013, a total of 60 million EUR of Tekes funding was provided to VIGO companies.

Finnvera Venture Capital can also provide a maximum of 1 million EUR in equity investments. The VIGO companies must go through a separate screening process to get funds from Finnvera Venture Capital. However, in the future the VIGO program coordinator is seeking to package funding from Tekes and Finnvera through a single screening process for both institutions (Interview Program Coordinator 2014).

Even though no new governmental bodies or new public funds were created as the VIGO-program was initiated, it was estimated that the VIGO-program would impose an extra expenditure of 100 million EUR for government funds during the six years that the program is being run. Over the course of the same period, 100 million should be raised by private investors, which was achieved after the four first years (Interview Program Coordinator 2014). According to the Finnish Ministry of Employment and Economy, the VIGO program has led so a significant increase of international private investors and VC investments in Finnish startup companies (Interview TEM 2014).

Case 2. 'Picking winners'

Approximately 200-250 projects are screened each year by each incubator (Interview Incubator CEO 2014a). The screening process, as described by one of the incubator managers, involves the following steps: when being approached by a company, it is decided whether or not the company meets the investment focus of the incubator. Secondly, the idea is discussed in a weekly meeting with the rest of the team, and it is decided if further screening should be conducted. If so, the company meets the entire incubator team, all existing materials are scrutinized, in which the execution plan and financing needs over the next few years are emphasized. How negotiations and due diligence are conducted depends on the current stage of the company, however, external actors are rarely used in this process. A final decision is based on the deal terms and potential syndication partners. All though there may be a difference in particular screening steps, this appears to be the 'general' due diligence approach of most incubators.

Investment criteria	<p>Incubators are implicitly considering the potential return of their investments, as they require business ideas with a large, global market. Disruptive ideas seem to be preferred.</p> <p><i>«We invest in companies who can become dangerous. It has to have the potential to become a global leader, a 'category winner'».</i> (Accelerator CEO)</p> <p>It appears as if incubators are more concerned about whom they invest in rather than what they invest in. Although not a definite prerequisite, a good team may supersede high technology and market uncertainty.</p> <p><i>«We didn't have anything else but a slide deck, and actually [the incubator] never even saw the slide deck. So they saw our team and they said "okay, this is the team for this one, so we'll take a chance with you guys"»</i> (Company CEO)</p> <p>Incubators invest from their own balance in firms that are significantly uncertain.</p> <p><i>«Through the accelerator we invest into companies that are just ideas [...] they are just projects for us, they are in the form of a company, but they are looking for a market, a business mode, a product-market fit.»</i> (Incubator CEO)</p> <p><i>«We basically might invest in you just having an idea.»</i> (Incubator CEO)</p>
Timing and fit	<p>The incubator needs to see that the company has an unreleased potential that can be utilized to increase the value of the company. This is typically recognized as a 'flaw' in the companies.</p> <p><i>«When the companies come to us they need to have a good upside, but nearly all of them have something wrong... there must be something wrong in the plan, the team, the business model, or on the technological side, so that there is a role for the accelerator to actually grow the case.»</i> (Incubator CEO)</p> <p><i>«When evaluating projects, we try to find what is 'wrong' and how to change that. That's the core.»</i> (Incubator CEO)</p> <p>The incubator management needs to believe that they have the capabilities to «fix the flaw» in the companies.</p> <p><i>«We require that there's a 'match', so that we can help the companies.»</i> (Incubator CEO)</p>

Case 2. ‘Making winners’ by reducing uncertainty

The management staff in the incubators provided hands-on support and could in the early phase of the acceleration period spend up to two days a week with a portfolio company. The support appears to be of a strategic and operational nature, in which the incubator managers work on the actual tasks of the companies. Support for specific issues could also be initiated by the entrepreneurs.

«We want to be active in the company, spend one or two days a week sitting with the company and taking charge. Typically we are very active for a year, taking the role as head of product development, head of strategy, head of business development [...] We have a set of goals, for instance getting the next customer, so that we can raise the next funding. And we work on these goals every day.» (Incubator CEO)

Reducing technology uncertainty	<p>Generally technical support does not seem to be a focus in the program. However, one of the incubators had a technical expert who could provide support that could enhance the scalability, thereby preparing for internationalization.</p> <p><i>«We have a «CTO guy», he often changes the architecture of the company’s product to scale it.» (Incubator CEO)</i></p> <p><i>«They connect the dots and have really good inputs on the product in the early phase.» (Company CEO)</i></p>
Reducing market uncertainty	<p>Both incubators appear to mostly focus on market activities, particularly by turning attention to-, and working on how to, approach international markets. This was done through identification and co-selection of potential markets and partners.</p> <p><i>«During the incubation period we take some key role that really accelerates the sales, finishes the product or starts the internationalization.» (Incubator CEO)</i></p> <p><i>«I work mostly on internationalization, getting partners and doing international sales. This week I’m helping a company with selecting 10 cities in Europe to which they will expand to.» (Incubator CEO)</i></p> <p><i>«We started expanding to international markets much earlier than what we would have done otherwise.» (Company CEO)</i></p> <p><i>«They are now helping us with finding distribution channels and partners. We are now in a stage where our technology is very stable, and it is all about sales and marketing.» (Company CEO)</i></p> <p>The incubator provided significant strategic support, for example by changing the business model to ease the customer acquisition process.</p> <p><i>«We are good at making the damn change. For instance, we totally changed one company’s business model. When we came in they had an IT system, which they tried to sell to taxi companies. But taxi companies don’t have money and they don’t know IT. We said okay, don’t go to taxis. Let’s use the IT system ourselves and bring rides to the taxi companies. Instead of asking money from them, we bring money to them because we’re operating the IT system to consumers to pre-book their rides.» (Incubator CEO)</i></p>
Reducing management uncertainty	<p>All companies interviewed had a strong team before joining the incubator. However, the incubators provided valuable connections and introductions to strengthen the management team, with special emphasize on sales and internationalization expertise.</p> <p><i>«One of our field guys was brought in to an introduction by them, he was recommended, I met him, and he’s now one of our best sales guys.» (Company CEO)</i></p> <p><i>«They are introducing us to very, very interesting people that could be part of the management in the future. We are now scaling up, so we are looking for sales and marketing people.» (Company CEO)</i></p> <p>The incubator management could also strengthen the management team by taking on a managerial role (typically CEO/CMO) in the companies themselves, although (mostly) on a preliminary basis. In addition, they typically take permanent board positions in their portfolio companies.</p> <p><i>«We are really an extension of the team.» (Incubator CEO)</i></p> <p><i>«Typically we are very active the first year, taking the role of head product development, head of strategy, head of business development, etc. Also, we take board seats.» (Incubator CEO)</i></p>
Focus	<p>The incubator managers can take care of emerging company tasks when their portfolio companies are too ‘busy’.</p> <p><i>«We are their ‘extra hands’ so they call anyone of us and ask “hey can you assist me with this”, and we will do it if we can. We don’t bill for everything we do.» (Incubator CEO)</i></p>

Case 2 ‘Selling winners’ by reducing information asymmetries

Supporting the companies to receive financing, both from international and domestic funding sources, is one of the most important value-added contributions from the incubators (Autio et al. 2013). In Finland, the incubators have a special role to support their companies to secure governmental funding from Tekes, considering they have a ‘key account manager’ there. Some of the companies in this study also mentioned that securing this funding was one of the main reasons for joining the incubator, and generally put less emphasis on the operational support. However, companies also reported significant support related to obtaining private investments as well.

<p>Establishing information flow</p>	<p>Incubator managers have extensive networks with potential investors, both in Finland and internationally, which they utilize to bring investors to the table. Fundraising support was emphasized as one of the most important value-adding support activities.</p> <p><i>«One of our guys has spent time in Silicon Valley and made investments there [...] He has a huge network of angel investors.» (Incubator CEO)</i></p> <p><i>«The idea is that we have like a «virtual fund»: we have 30 – 40 business angels who are close to us and we typically raise 150k-300k as a seed round.» (Incubator CEO)</i></p> <p><i>«They main value is really the connections to the possible future investors. They really helped us with that.» (Company CEO)</i></p> <p><i>«They have really good VC connections in the United States and Europe. We ended up getting our VC from London.» (Company CEO)</i></p>
<p>Improving information flow</p>	<p>In addition to helping with building presentation decks, the incubator managers also joined meetings and negotiations with investors.</p> <p><i>«For example, we are now closing a round raising 200k. So I was helping the company with negotiating with those investors. I would join meetings and help with presentations. (Incubator CEO)</i></p> <p><i>«When pitching to investors, the incubator management did some of that convincing, making the business look more serious.» (Company CEO)</i></p>
<p>Transferring information about quality</p>	<p>One of the incubators had previously enjoyed significant success, which they believed provided them credibility in the eyes of investors.</p> <p><i>«The incubator has been very successful, and there’s a comment ‘if one could only put some money in all of the companies [Incubator] has invested in, one would make so much money’. It adds credibility.» (Company CEO)</i></p> <p><i>«In the VC round it was a very good sign in terms of robustness having the incubator on board.» (Company CEO)</i></p> <p>Being associated with a specific incubator made it also easier to obtain governmental funding, as it led the company to be put under less scrutiny than other companies:</p> <p><i>«So our process with getting the Tekes funding was ‘okay you’re part of the VIGO, you’re part of ‘Incubator X’, and the idea kind of makes sense, let’s move forward’.» (Company CEO)</i></p>

Cross-case analysis

How incubators ‘pick winners’

Policy makers argue that governmental schemes promoting entrepreneurship cannot focus on a small number of high-growth firms, because we do not know which firms will become high growth businesses and which won’t (Shane 2009). The vast uncertainty affiliated with early-stage, high-growth startups, imposes a considerable challenge when selecting likely winners from losers and the ‘lemons’ problem (Akerlof 1970) applies for incubators the same way as for private investors.

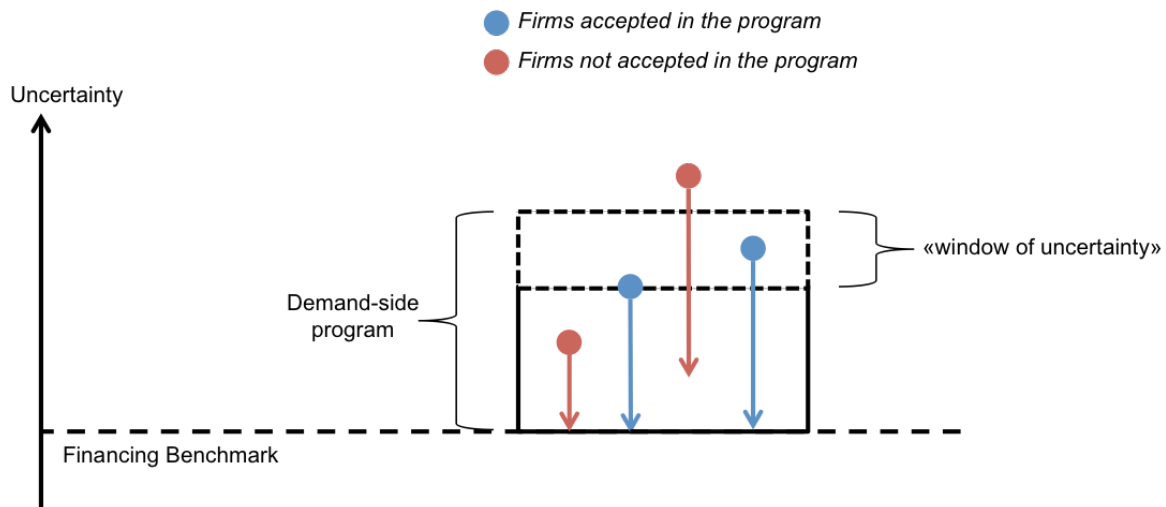
	Case 1. Technological Incubators Program	Case 2. VIGO Accelerator Program
Screening	<ul style="list-style-type: none"> • Conducted by private, for-profit organizations, approved by government • Standardized procedures • Assisted by external experts 	<ul style="list-style-type: none"> • Conducted by private, for-profit organizations • No standardized procedures • External expertise is not used
Investment criteria	<ul style="list-style-type: none"> • Large market, disruptive idea • Some technology confirmation preferred • Emphasis on team 	<ul style="list-style-type: none"> • Large market, disruptive ideas • Emphasis on team
Timing and fit	<ul style="list-style-type: none"> • Companies should have a ‘flaw’ that incubators can target • Companies should become ‘investor ready’ within incubation period • Incubator-company match required 	<ul style="list-style-type: none"> • Companies should have a ‘flaw’ that incubators can target • Incubator-company match required •

There were some slight differences in the two programs in terms of screening, in which the Israeli program appeared to utilize a more rigid process. However, both screening procedures were quite comprehensive and mainly undertaken by individuals in the incubators. Risk/reward assessments were also implicitly present in both programs: large market potential and a differentiated product represent possible reward, while uncertainties in management and technology (mostly Israel), were factors affecting the perceived risk. Such assessments are somewhat consistent with venture capital evaluations methods (Tyebee & Bruno 1984). Thus, aligned with Shane (2009) and Mason & Brown (2013), using similar methods and having comparable expertise, incubator managers are likely to be *as capable* evaluators as venture capitalists, but not necessarily any better. However, it seemed apparent that both programs could tolerate a high degree of uncertainty, especially as experienced teams can be accepted based on a slide deck alone. This raises the question of why the incubators can select likely winners from a pool of firms that is perceived as ‘too risky’ by venture capitalists.

It can be argued that governmental funding functions as leverage to allow the incubators to operate at the same level of risk as venture capitalists, but it does not affect the inherent uncertainty of the companies. However, incubators seem to be more concerned about how post-investment activities can grow the companies, rather than what is certain and what is not. Whereas investors in later stages would ask, ‘*is this venture a likely winner*’ (Mason et al. 1996), incubator managers reasoning is better explained as ‘*can we make this venture a winner*’.

Therefore, the potential post-investment activities serve as an entry criterion in the pre-investment phase. Incubator managers are deliberately looking for ‘flaws’ for which they can make a contribution, and these flaws are related to the level of uncertainty within the dimensions of market readiness, technology readiness or management readiness. For example, for cases in which investors would say, «Ok, this seems all good except this *one* fundamental ‘flaw’. Go fix it, then come back again» (Mason et al. 1996), incubator managers might be willing to tolerate this. However, the incubator managers need to believe that, given available financial resources and their own capabilities, the company can reach its next fundable milestone within the incubation period. Thus, it needs to be a right level of uncertainty related to the companies and a fit between this uncertainty and the capabilities of the incubator managers.

This might imply that there is a ‘window of uncertainty’, in which the timing is right for incubation. If a company has too many ‘flaws’, it may not become investor ready along all dimensions of investor readiness, thereby failing to bridge the financial gap.



Note that a lower limit of accepted uncertainty was observed. This is apparent due to the fact that (1) ventures at such ‘low’ risk level appear not to have the need for specialized capabilities the incubators have to offer, and (2) that the cost of acquiring shares in ventures close to the financing benchmark are not affordable for incubators.

It is likely that the acceptance of a ‘flaw’ affects the agency problems that is acknowledged to impede the investment process for new ventures (Sahlman 1990; Hall & Lerner 2009). The incubators outspoken risk-tolerance may allow firms to adopt a more ‘honest’ approach, making it less necessary to engage in opportunistic behavior that can adversely affect the perceived quality of the venture. If the entrepreneur’s information about the firm is perceived as more realistic, thereby more credible, it will help the investors to distinguish between good firms and ‘lemons’. This is aligned with the underlying purpose of both programs, as the governmental funding is supposed to increase incubator managers’ risk tolerance. Furthermore, more open communication in the pre-investment phase can reduce the risk of unpleasant surprises about the situation of portfolio companies in the post-investment phase, thus reducing the need for extensive monitoring (Van Osnabrugge 2000).

How incubators ‘make winners’ by reducing uncertainty

Entrepreneurial activities and rent seeking lead to a need of investments that are characterized by uncertainty, in which the outcomes and distribution are unknown (Alvarez 2007; Knight 1921 referred in Sørheim et al. 2011). New, especially technology based ventures, have problems raising funding because of the vast uncertainty (and information asymmetries) present in the financing process (Sørheim et al. 2011). Therefore a need is present for entrepreneurs to reduce the uncertainty in their company to a level that investors can accept, thereby becoming ‘investor ready’ (Douglas & Shepherd 2002).

Both programs reduce uncertainty in their portfolio companies through provision of business support and network mediation, which contribute, and often aim to, make these ventures investor ready. The support provided generally targets the ‘flaw’ of the companies when they enter the program. Typically, there is uncertainty related to whether the technology works or whether there is a market. Through milestone achievements, the tailored support contributes to generate trustworthy information about the state of the portfolio company.

	Case 1. Technological Incubators Program	Case 2. VIGO Accelerator Program
Resource allocation	<ul style="list-style-type: none"> • 8-10 employees per incubator • ~8 firms per incubator • 24 month incubation period 	<ul style="list-style-type: none"> • 2-4 employees per incubator • 6-8 firms per incubator • 18-24 month incubation period
Approach to support	<ul style="list-style-type: none"> • Pro-active and continuous • Consulting support • Strategic advise 	<ul style="list-style-type: none"> • Pro-active and continuous • Operational support • Strategic support
Reducing technology uncertainty	<ul style="list-style-type: none"> • Technical facilities in-house • Technical experts in-house 	<ul style="list-style-type: none"> • Not generally emphasized
Reducing market uncertainty	<ul style="list-style-type: none"> • Provide network to market stakeholders • Provide market specific information 	<ul style="list-style-type: none"> • Specific focus on international markets • Strategic support
Reducing management uncertainty	<ul style="list-style-type: none"> • Incubator recruiting managerial supplements or replacements 	<ul style="list-style-type: none"> • Assist in recruitment of management supplements • Incubator management takes company management roles.
Focus	<ul style="list-style-type: none"> • Administrative services 	<ul style="list-style-type: none"> • An ‘extra hand’

In essence, the overall *focus* and *content* of the provided business support was very much alike in both cases. The most substantial difference between the cases appeared to be in the actual *approach* of the support.

Approach of support

Both programs provide proactive and continuous support, meaning incubator management would proactively engage in the firm’s activities, focusing efforts on the ongoing development needs of the firm and providing continuous “business critique”. However, there appeared to be a clear distinction in terms of how involved the incubator managements were in the companies: the Israeli incubator managers provided mostly consulting and strategic advice, whereas the Finnish incubator managers provided ‘hands on’ operational support, for example by taking a managerial role in the company for a limited time period, taking charge of the company as a whole or specific strategic areas such as internationalization or sales & marketing. Drawing on Bergek & Norrman (2008), we can describe the distinction between the two approaches: the incubator managers in Israel would see themselves as ‘external facilitators of a process that is primarily managed by the firms themselves’, whereas the Finnish incubator managers would see themselves as ‘managers of the incubation process itself’.

Incubators in both programs tend to focus on a similar, relatively low number of companies, which might indicate that they spend a similar amount of time on supporting each of their companies. This can be explained by the Finnish incubators in periods spending up to half a week on a single firm, while the Israeli support seem to be more continuous support throughout the incubation period, interacting with and providing counseling to a larger number of firms on a daily basis.

Activities reducing uncertainty

In both cases, contributions from the incubators were present along the dimensions of technology, market, and management uncertainty. There was greater focus on technology support in the Israeli program, which can be explained by the nature of the technical development in medical- and life science industries, as opposed to the nature of technical development in the software-industry observed in the Finnish program. Market uncertainty was in both programs reduced by providing access to market information, or (indirectly reduced) by connecting the portfolio companies to market actors, thereby getting the companies closer to market confirmation. Rather than undertaking management coaching, incubators in both programs reduced the management uncertainty through supplementing (or replacing) team members.

Therefore, it seems that the incubators can be regarded as a version of an investor readiness program (Mason & Harrison 2001), as it reduce uncertainty in technology, market and management, thereby increasing the level of investor readiness in these dimensions (Douglas & Shepherd 2002). In general, there was a strong emphasize on focusing all activities, whether performed by the company or incubator management, on conducting tasks that would increase the quality and value of the company in the eyes of potential investors.

Focus

Common for both cases is that incubator managers were able to *identify* the most important activities needed to become investor ready, thereby ‘focusing’ on what is required to become investor ready. In that way, scarce resources are allocated in an efficient manner.

The importance of focus was explicitly emphasized in both cases, especially in the Israeli program. Providing a comprehensive ‘umbrella of professional services’, the Israeli portfolio companies were able to focus on developing the company. The Finnish incubators tried to achieve this as well through providing an ‘extra hand’ when the companies were busy with value-creating activities. Such services thereby contribute to faster reduction of uncertainty in the companies.

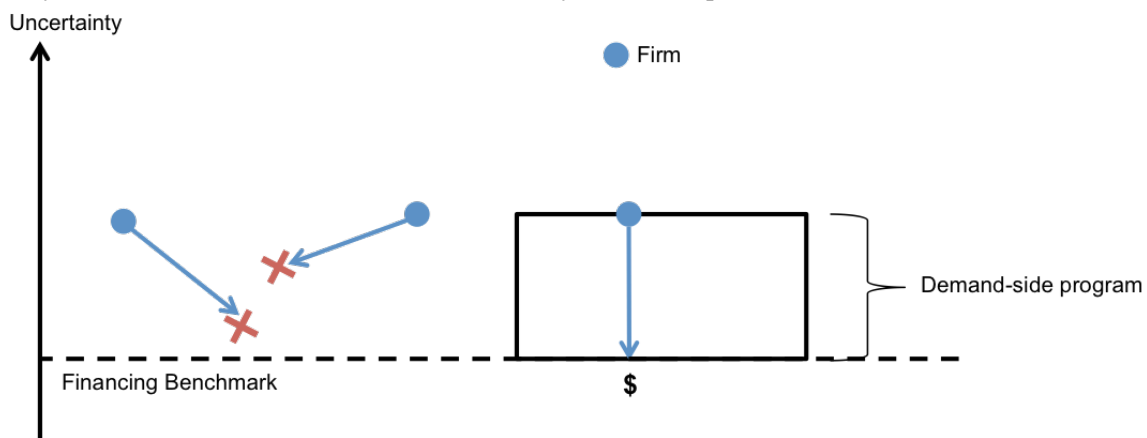


Figure 2: Companies receiving focused support inside a demand-side initiative are able to become investor ready more efficiently. The length of the arrow illustrates resource expenditure. Firms outside the program may ‘crash’ because of resource constraints; all though the move in the right direction, they are not focused enough to bridge the ‘gap’ with the available resources.

Therefore, portfolio companies in the incubators were able to become investor ready more efficiently than firms outside the program. Firms outside the program are more likely to spend their resources less efficiently, typically over-emphasizing technology readiness, not recognizing that the firm must be ready on all dimensions to be attractive to investors (Douglas & Shepherd 2002).

Relating the support to ‘Knightian uncertainty’ (Knight 1921 referred in Sørheim et al. 2011), the activities conducted contribute to companies either obtaining more information (e.g. about external market factors) or to achieve milestones that create information about the viability of the company (e.g. through prototype testing or initial sales). Thus, information is made available, or even generated, so that uncertainty is transformed to risk that investors can relate to.

How incubators ‘sell winners’ by reducing information asymmetries

Information asymmetries are hampering the investment process for potentially good firms, either because of entrepreneurs and investors unawareness of new ventures, or because of investors difficulties with interpreting the quality or intentions of the new company (Sahlman 1990; Hall & Lerner 2009), thereby causing the ‘lemons’ problem (Akerlof 1970). After having picked the most promising firms, reduced their uncertainty and made them investor ready through incubation, it is in the interest of the incubators that the company receives new investments for further growth. In this role, the incubators have more information about the quality of the portfolio companies than the investors. Our study of the programs in Finland and Israel indicate that incubators, or incubator managers in particular, play a key role in reducing these information asymmetries.

	Case 1. Technological Incubators Program	Case 2. VIGO Accelerator Program
Establishing information flow	<ul style="list-style-type: none"> • Connect portfolio companies with investors 	<ul style="list-style-type: none"> • Connect portfolio companies with investors • International focus
Improving information flow	<ul style="list-style-type: none"> • Assist preparation of presentations 	<ul style="list-style-type: none"> • Assist preparation of presentation • Incubator managers join investor meetings and negotiations
Transferring information about quality	<ul style="list-style-type: none"> • Incubator managers are a trusted source of information • Incubator program is well reputed • Easy access to VCs (meetings) • Support provided give investors confidence of a projects viability 	<ul style="list-style-type: none"> • Incubator reputation lead to increased credibility for company • Incubator reputation allow for less scrutiny when obtaining public funding

Establishing and improving information flow

In both programs, both incubator managers and companies expressed that the incubators provided significant value to the companies by connecting them to possible investors in their network, thereby reducing the transaction costs related to the search for an investor (Nightingale et al. 2009). The Finnish program appeared to have a stronger emphasis on international investors.

Both programs were also involved in preparing presentations. Some were in fact even holding presentations on behalf of and/or together with their portfolio companies. In this way, assuming the incubator management is more proficient at presenting than the entrepreneurs, the information flow between companies and investors are improved and clarified, thereby reducing information asymmetries.

Information about quality

Investors do utilize social ties as a mean to transfer information about investment opportunities. The Israeli incubators in particular, expressed that they were a trusted source of information to the investors, which might be a result of their track record or their personal social ties. Regardless, the agency problems are reduced if the information that the incubator provides about the quality of the venture is more trustworthy than the information the company could provide on its own (Shane & Stuart 2002).

The VIGO accelerator companies clearly expressed that the accelerator companies added credibility to the companies when interacting with investors. Such clear observations of the company perspective were not made in the Israeli program, nor where they rejected. The track record of the Israeli program and the indication that the incubators easily could get the attention of other investors may indicate a certain status. Then the Israeli portfolio companies will benefit from this status, as the status of a company can be derived from the status of the exchange partner (Podolny 1994). The reason for this spill-over effect is however not apparent:

As Stuart et al. (1999) suggest, if there is a perceived association between evaluative ability and prominence, being selected by a prominent incubator will in itself be an endorsement to a portfolio company. This association can be assumed to be present as both VIGO-accelerators and Israeli incubators

are investors whose business models rely on being able to choose potential good firms. On the other hand, it may also be the result of the incubators' recognized 'way of doing things'; the quality of the support provided to their portfolio companies that leaves investors with an impression of the companies being part of a larger organization.

Both countries have a track record of producing successful startups: The Israeli program generates high amounts of private investments and some incubators have enjoyed numerous exits. The VIGO program in Finland is starting to see that their efforts are bearing fruit through some large international successes and increased investments from international companies. Such a track record, regardless of it being a result of the ability to pick the promising companies or the ability to develop these, has a positive effect on the status of the incubator companies. If there is an association between the status of a new venture and how an investor interprets its quality, being associated with an incubator with a track record will signal quality that reduce the adverse selection problem arising from information asymmetries.

Both incubation programs reduce information asymmetries through functioning as a mediator, connecting companies with investors or improving the information flow between them through presentational assistance. However, less obvious findings revolve around how the prominent incubators have an effect on the lemons problem: through explicitly providing (trusted) information or implicitly signaling the quality of the portfolio companies, the investors can more easily interpret the abilities of these firms compared to other less able firms. In this way, the prominent incubator has the role as a *guarantor of quality*, thereby mitigating the lemons problem.

Cultural and contextual considerations

Many governmental programs have failed because of policy makers incautiously replicating successful programs from elsewhere by framing their goals such as «how do we replicate the success of Silicon Valley» (Armour & Cumming 2006), failing to considering the context in which it is implemented (Rasmussen & Sørheim 2012a).

The Israeli people have an entrepreneurial mindset, which is grounded in both history and culture. First of all, the country has had very little natural resources. This has given the people a notion of a need to “think outside the box” in order to survive. Children are from an early age encouraged to challenge the existing and obvious. In entrepreneurship, failure is perceived as an opportunity to learn and is not something that should be avoided. Secondly, hostile countries surround Israel, which has generated a need for sophisticated military technology, also applied for non-military purposes. The neighbors are excluded as potential partners or markets, which have created a need to direct attention to international markets and to technologies that do not have high shipping costs. These factors have put Israel in an excellent position to excel in the growing knowledge and innovation based economy (Senor & Singer 2011). As stated by an incubator manager in the TIP-program: «*The DNA of the Israeli entrepreneur would be quite hard to replicate*».

The Israeli problem-solving mindset and efforts to develop sophisticated technology in the military are factors that, in addition to significant governmental intervention since the early 90s, have contributed to Israel becoming one of the most intensive hi-tech clusters in the world (Avnimelech et al. 2007). Very high R&D expenditure (#1 globally as percentage of GDP, (The World Bank 2011)), combined with entrepreneurial-friendly people, generates a sufficient deal-flow for the incubators. The incubators also get access to sufficient human capital to run the incubators. As described by the TIP-manager «*It's not difficult to find good people for incubator staff. We have lots of them in this market, people have already been in a few startups, they were VCs, they have gained the necessary experience*».

Finland does not have an equally strong culture for entrepreneurship as Israel. Before the VIGO-program was established, a study used the word «paradox» to explain Finland's unsatisfactory performance in high-growth entrepreneurship, despite the presence of structural conditions that usually favor such activity (Autio 2009). Finland ranks 2nd after Israel in terms of R&D expenditure as percentage of GDP and has had an emphasis on engineering-intensive industries (The World Bank 2011). However, Finns are typically risk averse, and entrepreneurs has generally had low growth-aspirations (Ruohonen & Oy 2007;

Autio 2009). There was also a lack of people with business experience that were willing to support aspiring companies with growth ambitions. As described by a representative in the Ministry of Employment and the Economy: «...we analyzed that in Finland, we do have enough experienced business people, but they are not interested in startups. They want to sit in boards of big companies, but not in startups».

Both countries have the structural conditions, in terms of emphasize on R&D and technology, for high-growth entrepreneurship in place, which would imply that both programs would enjoy a sufficient deal-flow to the incubators. However, as the culture differs significantly, the Israeli program should have better access to qualified people, both to run high-growth companies and to run incubators. This explains that, in addition to promoting high-growth entrepreneurial companies, the VIGO program has a specific objective to link these companies to internationally experienced business professionals and strengthen the high growth capabilities in Finland in general (Autio et al. 2013). In Israel, as it is today, there does not seem to be a need for the government to facilitate the development of international growth capabilities, as these exist as a result of the context and culture of the country. However, despite the major contextual differences in these countries, the two programs appear to be very similar.

The importance of industry experts

Based on findings in this study, the incubator management appears to be a critical success factor for the programs. First, they need to be able to distinguish the firms that can become high-growth ventures from the ‘lemons’, which in itself is a difficult task (Shane 2009; Hackett & Dilts 2004b). This study has revealed that incubator managers, since investing at such an early stage, identify and accept a ‘flaw’ in the business concepts and recognize whether something can be done with this flaw, and whether they have the capabilities to do so. Secondly, the incubators have a clear objective to develop the companies to become investor ready. They know what investors expect in terms of market readiness, technology readiness and management readiness, and recognize what their portfolio companies should focus on to reach this level of readiness. Finally, the incubator managers leverage personal networks to identify and approach potential investors for their portfolio companies. Experienced individuals with a track record or a certain status will also improve how investors perceive the quality of the portfolio companies.

It seems apparent that, in order to successfully conduct these tasks and to make a contribution, the incubator management will need to understand business, have experience as an entrepreneur or investors, and have a network to utilize. It seems doubtful that someone without such experience, for example government officials, will be able to successfully make the necessary assessments and contributions. As put by a representative in the Finnish Ministry of the Employment and Economy: «Government agency officials, like me, if they start to make direct investments in companies, it would be disastrous.»

The importance of government funding

This study has emphasized the importance of the activities conducted by the incubators in the two programs. However, financial resources are crucial for companies that wish to grow (Carpenter & Petersen 2002b). It is therefore important to point out that the incubators are not just measures to obtain finance at a later stage, but also direct sources of funding. The activities undertaken in the incubators in order to achieve milestones that trigger funding from other sources require access to finance. The incubators in both programs invest money from their own balance in the companies, but it is not enough to make a significant contribution. The governments provide the additional funding that is necessary to develop the companies to a level, from which the market can finance the companies on its own.

How this is done differs between the two programs. The companies in the Israeli TIP-program receives funding as a direct result of being accepted to an incubator, although with the Office of Chief Scientist approving the incubators decision, while being accepted by a VIGO-accelerator provides a fast-track to governmental funding through TEKES. These governmental funding sources provide a significant amount of finance to the companies, up to 600 000 USD in the Israeli program and up to 1M EURO in the Finnish. In Israel, in which the deal-flow experienced by incubators is very high, the program manager in the OCS believed that up to four times as many companies than currently accepted for incubation were of a quality that made them eligible for incubation. However, sacrificing the size of the grants each company receives to be able to support more firms was deliberately avoided. As stated by the program manager:

«You have to be careful here. I will go to the extreme: Take the 50M USD that I have and divide it to 1000 companies. The amount of money that each company will get is not enough to do anything significant. Half a million USD is the minimum if you want a company to reach a real milestone that will attract private investors.»

Significant funding also appeared to be one of the main reasons for why entrepreneurs applied to the incubator programs:

«To be bluntly honest, I think the main thing that got us interested in the system was the ease and access to the government funding through Tekes.» (Company CEO)

«Nothing can be done without the money.» (Company CEO)

Furthermore, in accordance with the objectives of the programs, many of the entrepreneurs did in fact try to raise money elsewhere prior to joining the incubator program, however unsuccessfully:

«We tried to raise money from venture capital [prior to joining the incubator], but were not able to.» (Company CEO)

The governmental funding is not only important for the companies to meet their milestones. It also serves as an incentive structure to attract experienced individuals to get involved and invest in early stage companies. It is not rational for private investors to invest in the earliest stages of new ventures (Murray 2007). Significant governmental funding makes industry experts perceive running an incubator and invest in early stage companies as a good business opportunity. Regardless of whether the governmental funding is granted directly upon incubator admission or made available through a fast-track to a grant later on in the process, it provides the incubators the possibility to invest early on without being extensively diluted. The provision of “free money” makes it possible to reduce the uncertainty in the companies, thereby increasing the value of the companies to an extent that would not be possible without governmental funding. This was confirmed by two of the Israeli incubator managers:

«I think again they (government) give very, very generous matching financing in the incubators and our investment has leveraged a lot. But to do this without the leverage is very difficult considering the high risk we have.»

«The money from the government is the game changer if the industry we love will survive or not.»

Holistic value chain

Many policy makers create funding systems based on ad-hoc initiatives rather than holistic planning, failing to consider the value chain of public and private actors they are trying to copy (Rasmussen & Sørheim 2012a). In both cases the incubator program was interlinked with other programs, forming a holistic ‘value chain’ of governmental instruments. This ensures that if a project succeeds one step in the value chain, the necessary support to move it further down the chain is accessible, effectively until uncertainty is reduced sufficiently to attract private venture capital.

Figure 3 and **Error! Reference source not found.** illustrate the value chains of funding schemes in Finland and Israel. Each box represents a program; its vertical position represents the uncertainty of the companies it targets and the width of the boxes represents the relative amount of companies that are included. Both Finnish and Israeli government agencies offer public proof-of-concept funding as a first step in the value chain. In Finland, TEKES provides a «Planning for global growth» grant, typically at \$70.000 and 75% of total costs, as well as an R&D grant/loan. Public seed funding is offered through the YIC program, where VIGO projects enjoy priority treatment via an exclusive fast track (Maijanen 2014).

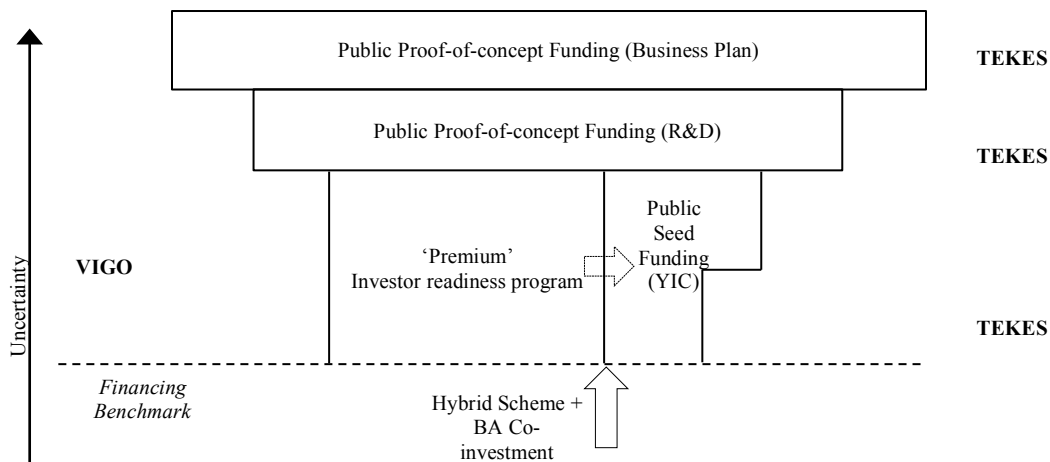


Figure 3: Value Chain of governmental funding schemes in Finland

In Israel proof-of-concept funding was offered through the TNUFA grant, typically \$50.000 covering 85% of eligible costs. Public seed funding is exclusively offered through the TIC program. Furthermore, public/private seed funding is offered through the HEZNEK seed fund, in which government grants of up to 50% are given to match private investments (not limited to TIP companies) (Ministry of Economy 2014).

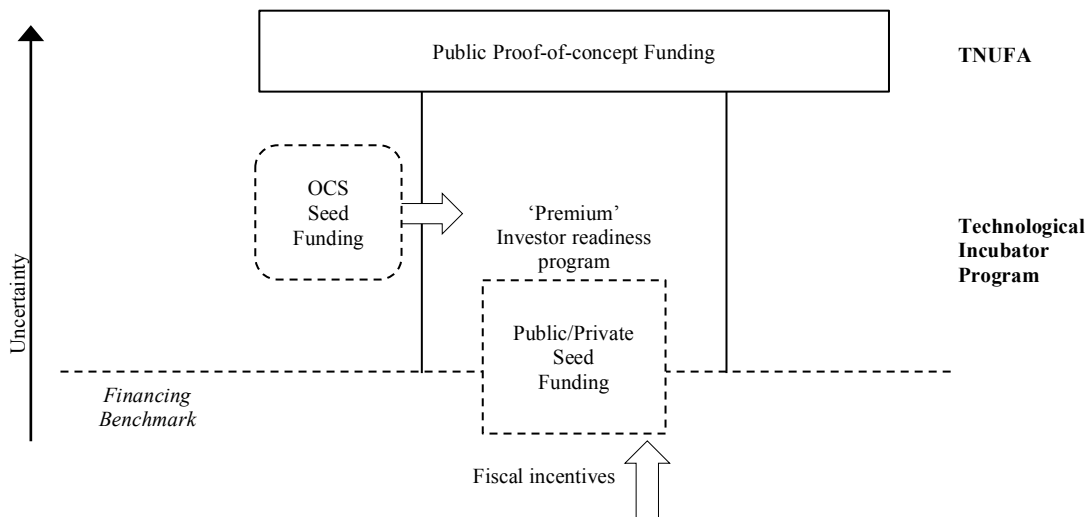


Figure 4: Value chain in Israel.

In both cases supply-side measures were implemented, thereby ‘pushing’ the financial benchmark to an appropriate level. In Finland, hybrid VC schemes and BA co-investment programs were launched, whereas fiscal incentives were given to private investors in Israel. Some might argue that governmental funding, as incentives for private investors to run incubators, make it appropriate to classify the two programs as supply-side programs instead of demand-side program. Indeed, the government increases the available pool of finance to early stage start-ups and increases the uncertainty tolerance for private investors (that invest through incubators). However, the purpose of the program is to increase the attractiveness perceived by private investors that invest without governmental leverage, and private incubators are used as a mean to achieve this. Thus, the authors argue that the program should be classified as a demand-side program.

What is important to notice is the *interdependence* of the initiatives. The incubator programs, or ‘premium investor ready schemes’, make up the very core of the value chain. However, they would not be able to function without the risk-reducing financial governmental support from OCS/YIC. Furthermore, they would most likely not enjoy a high quality deal flow of projects if it were not for the early-stage public proof-of-concept grants offered in both countries. On the other hand, the early-stage grants would not make any large impact if it was not for the premium program to take the best projects and continue to reduce uncertainty. Furthermore, all initiatives in both countries are *staged*, meaning that for each new initiative, fewer firms are accepted, and more resources are spent per accepted firm, ensuring that enough uncertainty is reduced to tell whether the firm is good or a ‘lemon’.

A model for governmental intervention

Promising high-growth companies, which have the potential to produce considerable benefits for the domestic economy (Murray 2007), face impediments raising an adequate amount of funding because of information asymmetries and uncertainty (Sørheim et al. 2011; Carpenter & Petersen 2002a; Alvarez 2007). Thus, governmental intervention is justified in order to close the financial gap, which can be done through both demand-side and supply-side intervention (Cressy & Olofsson 1997). It is important to find the right balance between focusing on producing high quality start-ups and making sure the private equity market has enough financial strength to obtain and further grow the high quality start-ups (Nightingale et al. 2009). However, governments have recently recognized that financial market seem to have a sufficient amount of investable capital, but is unable to find enough high-quality companies to invest in (Lundström & Stevenson 2005; Mason & Kwok 2010). Thus, existing demand-side initiatives fail to reduce the uncertainty to a level that investors can accept. This gap can be illustrated as in Figure 5: The companies in existing programs are by investors perceived as question marks. Apart from the few obvious good companies, it is not possible to distinguish the good companies from the bad.

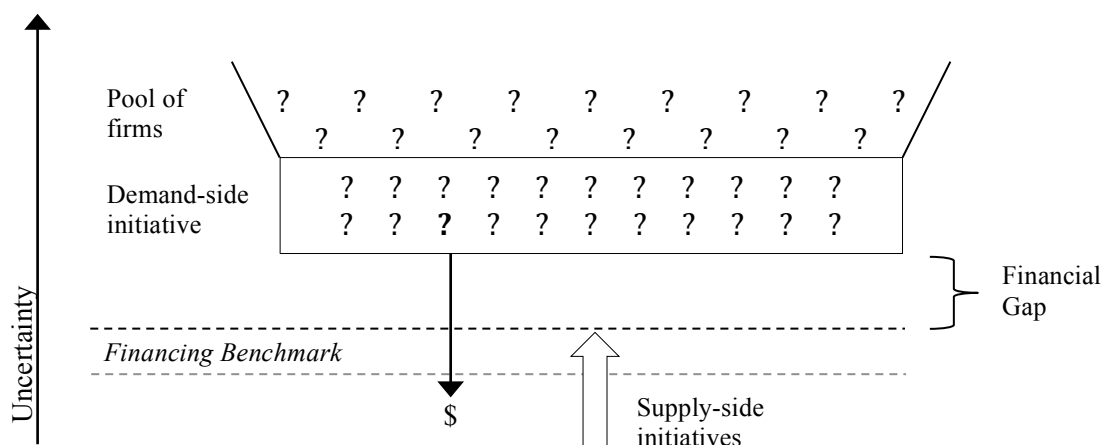


Figure 5: The financial gap. Demand-side initiatives are unable to reduce the uncertainty in start-up companies to a level that investors can accept.

This study has illustrated how demand-side programs can bridge the financial gap through leveraging for-profit private incubators. These incubator programs function as “premium” demand-side programs, which focus on developing the most promising companies to a point where the market can obtain and further develop the firms without governmental intervention. The incubators in this study do so by being able to select promising firms, identifying and addressing the uncertainties that must be reduced for investors to perceive them as attractive, and finally reducing the information asymmetries between their companies and potential investors. To successfully conduct these activities, the incubators need to be run by individuals with business experienced, preferably as entrepreneurs or as investors. The catalyst for this process is significant governmental funding, that first reduces the risk for experienced individuals and attracts them to operate and invest through incubators, and secondly, makes it possible for companies to achieve significant (uncertainty-reducing) milestones that trigger additional private investments. The incubator programs were typically implemented in a chain of programs, in which other programs provided smaller grants to a larger number of more uncertain companies.

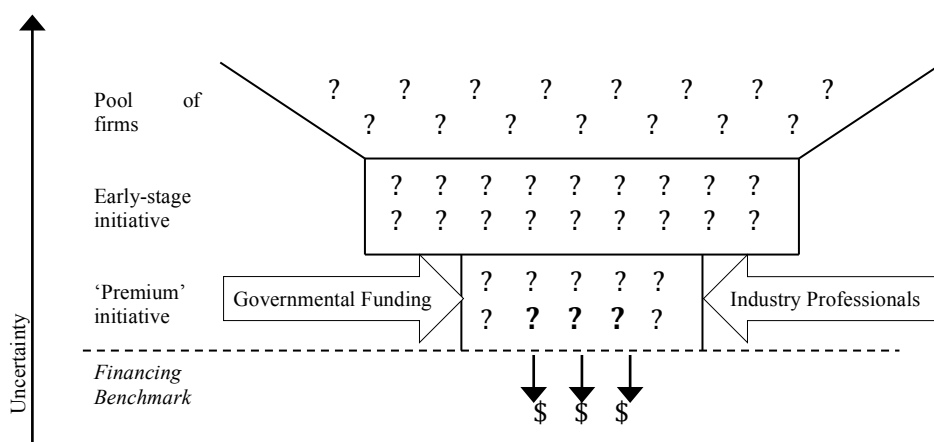


Figure 6: ‘Premium’ initiatives bridging the financial gap through a combination of significant governmental funding and competence from experienced professionals.

Implications

Policy makers

First, policy makers need to adopt a holistic perspective, and assess whether a lack of high growth firms is a result of a lack of financial strength on the supply side, or a lack of quality firms on the demand-side. We have provided a conceptual model that can help policymakers understand demand/supply-side dynamics, identify constraining factors and design schemes thereafter.

Second, there should be a value chain of programs that address different stages in the life cycle of early stage companies. Only implementing incubator programs that focus on promising companies, such as those in Israel and Finland, will not necessarily produce the desired outcome. The incubators need a deal flow of a certain quality to choose firms from, which, for example early-stage governmental grants, can contribute to providing.

Third, incubators with an objective to develop high growth firms need to be able to reduce the uncertainty for companies and information asymmetries between companies and investors. This requires capabilities that government officials, or others without business experience, are unlikely to possess. Policy-makers should appreciate the need of business capabilities in demand-side programs, and build incentive structures that attract experienced individuals to get involved and invest in start-up companies in a very early stage.

Fourth, policy makers need to acknowledge that a significant amount of funding is necessary to produce significant contributions for the companies supported by public funding. This suggests that it is necessary to prioritize a smaller number of firms, even if this exclude a group of companies that seeks governmental funding. If policymakers are unwilling to prioritize, there is a risk that the existing resources are spread too thin, ending up with a large group of companies without resources to develop their companies to become “investor ready”.

Investors

First, investor input can help policymakers make better and well-informed decisions on how to allocate resources. If there is a lack of quality firms, investors should promote allocation of resources to demand-side initiatives, instead of asking for more investable and risk reducing capital to invest in existing firms.

Second, this study shows that if considerable public funding is available, investments in early stage companies combined with significant managerial involvement can represent a viable business model.

Implications for the Norwegian context

The Norwegian VC-industry may be categorized as relatively active investors in both the ‘venture’ and ‘expansion’ stage of the firm life cycle. Since 1998 the Norwegian government has set up several national and regional seed funds, attempting to increase investment activities in this stage. In 2014, two new private/public seed funds were created, managed by private seed fund ProVenture (oil & gas) and Alliance Venture Spring (ICT). Each fund has a total size of 500 MNOK (Innovation Norway 2013). These governmental supply-side measures should imply that the supply-side does have the financial strength to obtain a larger number of promising companies.

However few ‘seed’ stage investments are being conducted by Norwegian investors. In recent years, Norwegian seed funds have been criticized for not following their ‘mandate’ of investing in early-stage ventures, but rather investing in firms on the same terms as traditional venture capitalists (Tillvaxtanalys 2011). In 2013, 17 MNOK was invested in seed stage firms by Norwegian investors (NVCA 2014).

There are several governmental agencies supporting the demand-side, including Innovation Norway, The Norwegian Research Council and SIVA. These actors provide firm support at the very beginning of the firm life cycle, typically through proof-of-concept grants and infrastructure. In theory, these initiatives are claimed to cover the ‘value chain’ from firm birth until the private equity market takes over.

In essence, the Norwegian context is characterized by considerable governmental supply-side intervention as well as early stage demand-side support in the form of grants and infrastructure. However, no firms are particularly prioritized in any of the schemes. Therefore, there is reason to believe that there is enough financial strength in the market place, but Norwegian investors perceive a lack of quality firms to invest in. On the other side, Norwegian startups are lacking resources to reduce uncertainty beyond early-stage proof-of-concept grants.

Therefore, there is a reason to believe that the implementation of a ‘premium initiative’, which priorities the most promising companies and provides incentives for involvement of private actors in the very early stages, can improve the financing situations and enhance the growth of promising new ventures. The authors recommend that a pilot project should be initiated.

Further research

This case study has had a holistic focus to reveal different aspects of the incubation process, of which some can be investigated in detail in further research. An important finding is that the incubators in this study reduce uncertainty and information asymmetries for their portfolio companies. However, the weighed impact of each of these contributions, on the probability to receive investments are however uncertain.

Another interesting finding is that incubators seem to signal on behalf of their incubator companies, something the companies may benefit from when interacting with investors. However, both the reason for this effect, and the actual outcome of it, is somewhat unclear:

- Companies may believe that they receive credibility through their affiliation with a prominent incubator. But how does this actually influence the decision making of potential investors?
- Is the signaling of quality a result of the track record of the individuals in the incubator, of the incubator itself, or is it a result of how outside actors perceive that the provision of support increase the robustness of the companies? What is the weighted impact on perceived quality for these potential reasons?

The programs studied provide significant funding to a small number of promising firms. However, there were indications that many firms were perceived to be good enough for the program, but were declined incubation due to budget limitations and an emphasis on providing enough funds to those that get support. It is therefore likely that opportunities are lost when only the most promising firms are supported. Finding the optimal balance between providing enough support to each firm, so that it is significant, and supporting enough firms, so losing opportunities is avoided, can serve as an interesting issue for further research.

The incubators are profit-seeking organizations that are likely to pick the most promising firms, even though they are co-investing with public funds, which might imply a risk for admitting companies that would have succeeded without their contributions. There were mixed signals in this study on whether this is the case or not: Some companies reported that their experience made them less dependent on the support that was available, some incubator managers said they would accept firms that they perceived as less risky, while others insisted that high risk was required. Further research could investigate more thoroughly if companies in such “premium”-programs are of a quality that the market would have financed them without government intervention.

Conclusion

This study has examined how incubators, as a demand-side initiative to foster high-growth companies, (1) are able to “pick winners” at a very early stage of the venture process, (2) “make winners” by reducing the uncertainty of the venture, making them “investor ready”, and (3) “sell winners” through reducing information asymmetries between the ventures and the companies. The incubators select companies for incubation based on a fit between company weaknesses and their specific capabilities. They identify and address uncertainties in the companies through value-adding activities, and signal venture quality so investors finally are able to distinguish the good companies from less able firms. This is enabled through significant amounts of governmental funding that enable uncertainty-reducing activities as well as attract the required expertise to get involved and invest in the new ventures.

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