MENON ECONOMICS

PAPER

DO GOVERNMENT SUBSIDIES BOOST SUPPLY OF EQUITY TO STARTUPS?

NEW POPULATION EVIDENCE FROM NORWAY

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Preface

This report contains an econometric study of the links between government entrepreneurship policy instruments and private sector supply of equity capital. The main question we raise, is whether supply of government funds through grants, loans and other financial support mechanisms tends to increase supply of private equity capital in subsequent years. The project was initiated and financed by the Norwegian Ministry of Trade, Industry and Fisheries and the study was started in early June 2007. We are thankful to Mattias Gripsrud and Knut Røed for valuable comments and to Marcus Gjems Theie for data work. All conclusions and representations are the sole responsibility of the authors.

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Content

Sammendrag på norsk

Statlig støtte til entreprenørskap:

Hvordan påvirkes investorenes vilje til å tilføre ny kapital?

I denne artikkelen ser vi nærmere på hvordan offentlige virkemidler som retter seg mot bedrifter i tidlig fase påvirker private investorers tilbud av kapital til selskapene. Fokuset er med andre ord på hvordan virkemiddelapparatet samvirker med private investorer. Vi er særlig opptatt av de entreprenørene som enten har klart å skape vekst eller som forventes å skape vekst.

Vi tar utgangspunkt i Brønnøysundregisteret og ser på alle private foretak som startet opp i tidsrommet mellom 2006 og 2010. Til sammen var det 126.058 oppstartsselskaper i denne perioden. Videre har vi definert begrepet vekstentreprenør på to ulike måter. Dette er foretak som har oppnådd vekst og foretak med et potensial for vekst. De to typene vekstentreprenører er gjensidig utelukkende. Vekstentreprenører som har oppnådd vekst karakteriseres ved at de oppfyller to kriterier, basert på regnskaps-historikk. Disse kriteriene er:

- En gjennomsnittlig årlig omsetningsvekst på minst 10 pst. i femårsperioden fra oppstart.
- I tillegg har foretakene en målt verdiskaping per sysselsatt på minst 500 000 kroner i år fem etter oppstart.

Vekstentreprenører med potensial for vekst karakteriseres ved at foretakene enten er innovasjonsrettet, kunnskapsintensive, teknologirettet eller har satset mye på investeringer i starten (såkalte J-kurve-selskaper). I tabellen under rapporterer vi antall vekstentreprenører i første kolonne. Drøye 5000 (4 %) har oppnådd vekst, mens knappe 30 000 (23 %) har potensial for vekst.

	Antall	Fått virkemiddel	Andel med virkemiddel	Andel tilskudd	Andel lån og garantier	Andel andre virkemidler	Andel av alle
Grupper							
Totalt	126 058	5 010	3,97 %	2,19 %	0,41 %	1,38 %	100 %
Oppnådd vekst	5 051	492	9,74 %	4,93 %	0,59 %	4,22 %	4 %
Potensiell vektst	29 006	1 770	6,10 %	3,25 %	0,35 %	2,51 %	23 %

For å identifisere foretakenes bruk av virkemidler har vi tatt i bruk NFDs og Samfunnsøkonomisk Analyse sin «Samspilldatabase» som er en sammenstilling av informasjon fra en rekke norske virkemiddelaktører som Innovasjon Norge, Forskningsrådet, Siva, Eksportkreditt og Enova. Utover å gi informasjon om hvorvidt og når ulike foretak har fått tilsagn på et virkemiddel, fremkommer det også hva slags virkemiddel foretakene har fått. Vi har kategorisert virkemidlene inn i tre typer: tilskudd, lån og garantier, og andre/multiple. I tabellen over rapporterer vi andelen av oppstartselskapene som har fått tildelt ulike typer virkemidler. Den mest utbredte formene for støtte til oppstartsselskapene er tilskudd. Lån og garantier tildeles en relativt liten andel av bedriftene. I tabellen ser vi også at bedrifter som har oppnådd vekst og som har potensiell vekst har en langt høyere sannsynlighet for å ha samspill med virkemiddelapparatet.

For å måle samvariasjonen mellom virkemiddeltilførsel og tilførsel av privat kapital, har vi studert utviklingen i innskutt egenkapital etter at virkemidlene er tildelt. Vi har etablert en kontrollgruppe av matchede eller parrede bedrifter som ikke har fått virkemiddel men som ellers ligner på de bedriftene som har fått.

Analysen viser at tildeling av virkemidler til oppstartsbedrifter etterfølges av et kraftig oppsving i tilførsel av innskutt egenkapital. Denne egenkapitalen kan komme fra eksisterende entreprenører eller fra eksterne eller nye investorer. VI har ikke skilt mellom disse to gruppene.

Effekten er særlig sterk blant de oppstartsbedriftene som blir betegnet som potensielle vekstentreprenører. Her øker tilførselen av innskutt egenkapital med 50 prosent mer enn lignende bedrifter som ikke har fått tildelt virkemidler.

For oppstartselskaper som allerede har oppnådd vekst, finner vi ingen signifikant positive sammenheng mellom tildeling av virkemidler og påfølgende tilførsel av innskutt egenkapital. Dette kan være fordi slike bedrifter i større grad kan finansiere nye prosjekter med tilbakeholdt overskudd, noe som gjerne fortrekkes fremfor å hente inn ny eierkapital.

Våre analyser viser videre at alle typer virkemidler påvirker kapitaltilførselen positivt, når vi ser på samtlige oppstartsselskaper. Den sterkeste effekten kommer i kjølvannet av tilførsel av multiple virkemidler.

Det har ikke vært mulig å identifisere noen entydig kausalitet i den nokså sterke og stabile samvariasjonen mellom virkemiddeltildeling og privat egenkapitaltilførsel. For å belyse kausale sammenhenger har vi gjennomført en liten surveyundersøkelse rettet mot investorer i næringslivet. Undersøkelsen viser at investorene tolker tildeling av virkemidler som et viktig signal om prosjektkvalitet. Det gir noe grunnlag for å hevde at det finnes en kausal retning i dette materialet.

Abstract

This paper presents an empirical analysis of the links between public support to startups in Norway and subsequent supply of new private equity capital to these firms. We apply a unique database covering all startups in Norway during the period 2006 and 2010 and have linked the database to a recently established public policy database for Norway covering all firm level state support schemes during the same period. We find that public support to startups is followed by significantly higher growth in new equity capital in the years following treatment. This result is robust for alternative econometric specifications, yet it is not robust for choice of startup characteristics. Startups that already have obtained growth do not display any stronger growth in supply of new equity capital post treatment. This finding may indicate that firms that have obtained growth already have sufficient access to private capital. Their financial track record is a clear signal of quality to the market, hence a signal through a public support scheme does not affect private willingness to invest. Other startups to experience significantly stronger growth in access to new equity capital if they have been awarded government support. One may argue that this result is consistent with the idea that participating in a public sector support scheme is viewed as a sign of quality among private investors. Our small-scale early stage investor survey provides strong support for this hypothesis.

1. Introduction

Lately, entrepreneurship as an engine for economic growth has received a lot of attention both in developed and developing economies, partly driven by the need to find new channels for growth after the financial crisis (see e.g. OECD 2009). The idea is that innovation is fostered more efficiently in new companies than in older and larger companies. The finding by Acs and Audretsch's (1988) that small firms were effective as innovators has motivated governments to support innovative new firms through various policy schemes, (see Autio and Rannikko 2016). Yet entrepreneurs may face large obstacles due to market imperfection. The presence of substantial imperfections in the market for early stage capital is well documented and it relates mostly to the existence of information asymmetries between the entrepreneur (the agent) and the investor (the principal), reducing access to capital. In markets with imperfections, there is potentially a case for government intervention. This is the rationale for government support schemes for entrepreneurs.

Nevertheless, there is mixed evidence on whether government support schemes for firms in an early stage do contribute to higher firm growth or not in the long run. This mixed experience is outlined in Josh Lerner's famous book "Boulevard of Broken Dreams" from 2009 that sums up several decades of research on entrepreneurship policy. One finding is that bureaucrats are not able to distinguish between good and bad cases, leading to the misallocation of supporting capital. Moreover, Acs, Alstebro, Audretsch and Robinson (2016) express strong skepticism towards policies that provides incentives to start new companies. Their main argument however, rests on the fact that entrepreneurs on average earn less than employees (ceteris paribus) in most countries. Thus, support schemes only attract labour away from the more productive activities in the economy towards less productive entrepreneurship. In Norway, the country which we study in this paper, the growth effects of subsidies offered to startups are found to be insignificant in a recent study by Cappelen et al (2016).

One important question in this debate is to what extent entrepreneurship policies tend to propel additional private sector funding for the companies. If they do, limited public financial resources may become more potent, contributing to reduce the market failure. On the other hand, in the case where bureaucrats are unable to identify the quality of projects, the ability to spur more private investments in companies may simply magnify the misallocation of capital. Yet, unless policy actually contribute to increased private sector investments in startups, the policies only remove the symptoms and not the market failure in itself. Hence it is important to investigate the links between access to public support schemes and the subsequent supply of private capital. There exists a limited literature on the capital additionality of such policy schemes, and the results are mixed. We review the literature in chapter 2.

This paper presents an empirical analysis of the correlation between public support to startups and subsequent supply of equity capital to these firms. We concentrate equity capital as it is reported in the company balance sheets under the post "Accumulated Equity Issue Proceeds (AEIP)". This implies that we are less concerned about the supply of capital through retained earnings. In other words, we are interested in studying the links between public support schemes and access to new private equity capital. We apply a unique database covering all startups in Norway during the period 2006 and 2010. We then follow their activity, their accounts and their balance sheets to 2015. This population of startups is described in chapter 3. Furthermore, we link the database to a recently established public policy database for Norway covering all firm level state support schemes during the same period. The database is presented and discussed in chapter 5. Linking these two datasets allows us to investigate firm level differences between those that receive support and those who do not. The empirical design, the methods and the results are presented in chapter 5 and 6.

A positive correlation between government subsidies towards startups and subsequent private equity investments may have at least four alternative explanations.

1. The subsidy is viewed by private investors as a signal of project quality
2. The subsidy enables entrepreneurs to invest in activities, IPR or equipment that subsequently may attract the interest of private investors to the firm
3. The subsidy makes the entrepreneur more willing to invest capital in the company
4. The subsidy requires that private investors finance a given share of the project. In that case, private capital is a prerequisite for subsidies and not the effect of subsidies.

In this study, we are unable to distinguish between these four mechanisms linking government subsidies to the subsequent supply of private capital. To pin down a mechanism, and to claim a clearer causal relationship, we would either need experimental data or the presence of a specific policy reform that randomly affects some of the startups. Since we do not have access to data on such reforms, our analysis will predominantly identify correlations which are consistent with all explanations 1-4 listed above. However, to gain further insight into causal mechanisms, we have conducted a brief investor survey, asking investors to what extent subsidies is viewed as a signal of firm quality and to what degree they are inclined to invest more if government subsidies are offered to a firm. The survey results are presented in chapter

The econometric tests indicate that public support to startups is followed by significantly higher growth in new equity capital in the years following treatment. This result is robust for alternative econometric specifications, yet it is not robust for choice of startup groups. Startups in the group “obtained growth” do not display any stronger growth in supply of new equity capital post treatment, whereas all other startups do. This finding may indicate that firms that have obtained growth already have sufficient access to private capital. Their financial track record is a clear signal of quality to the market, hence a signal through a public support scheme does not affect private willingness to invest. Alternatively, one should expect that firms that already run operational surpluses chose to finance their projects with a combination of public subsidized capital and retained earnings. In that case, they do not need new equity capital. This is consistent with the pecking order theory Myers and Majluf (1984) of project finance. In both ways, one should not find a significant correlation between public support and subsequent supply of equity capital.

2. A brief survey of earlier findings

Lerner (2009) and Parker (2009) have recognized the lack of "knowledge based practice" in the area of promoting entrepreneurship. As pointed out by Lerner (2009), there is evidence that innovation is important for economic growth, and that entrepreneurship is important for innovation; the big question is then whether public intervention can promote entrepreneurship. During the past 5-10 years, spurred by the financial crisis in 2008-09 and the increased popularity of public interventions in capital markets, a growing number of studies have investigated public SME finance in the innovation space. The financial assistance provided by policy schemes aiming at promoting entrepreneurship is offered in various forms: Credit guarantees, grants, equity investments and tax credits are common instruments. In this chapter we present results from recent empirical evaluations of different types of policy schemes. The survey does not exclusively focus on new firm, as it also includes policy measures directed towards SMEs. Yet the lessons learned are still highly relevant for this study.

Before we turn the attention to the international literature, we report the findings of a recent Norwegian study covering a wide range of government funded industrial policy measures. The study conducted by Cappelen et al. (2016) provides estimates for early stage companies. The study does not focus on the effect of policy measures on private supply of equity, but rather on the effect on employment, sales, value added and returns to capital. If that subsidies are large, both grants, loans and guarantees have a significant effect on sales and employment, but there is no significant effect on value added or return on capital in the startup companies. If subsidies are small, there are no significant effects at all. On the other hand, R&D tax credits appear to have a significant and positive effect on employment, sales revenues and value added in startups. The effect on productivity and returns on capital are, however,not statistically significant.

2.1. Loans and guarantees

The most common type of financial public policy measures directed towards entrepreneurs and SMEs is credit guarantees. Credit guarantee programs trigger bank credit by providing insurance to the bank against the risk of firm default. There are a number of studies from various countries such as Canada, UK, France, Italy, Japan and South Korea that investigate the performance of national credit guarantee programs in terms of their additionality in the capital market (Riding et al., 2007; Cowling, 2010; Lelarge et al., 2010; Boschi et al., 2014; Uesugi et al., 2010; Ono et al., 2013a). In general, the results tend to be positive with respect to the credit guarantee schemes' effect in improving access to finance for small firms. Boschi et al. (2014), however, find that the additionality is only positive above a certain lower treshold of the guarantees' coverage ratio. Ono et al. (2013a) find that if the loan with the public guarantee is provided by a bank that already has an established relationship with the firm, the loan is offset (partially or completely) by a decrease in other loans from the same bank. As emphasized by Riding et al. (2007), the schemes tend to differ in motivation and scope, making it hard to compare and interpret the results across countries. Although credit guarantee schemes often benefit innovative firms with limited collateral, most credit guarantee schemes are not directly targeted towards young and innovative firms. An exception is the Korea Technology Credit Guarantee Fund (KOTEC), targeted at technology-based newly founded firms promoting the growth of technologically advanced SMEs and venture businesses. Oh et al. (2009) find that the credit guarantee helped firms maintain their size and improved survival during the financial crisis. However, the credit guarantee program did not increase R&D activities or investments, and they found no growth in productivity.

2.2. Grants

Direct subsidies, in the form of grants, are a commonly applied instrument to promote young and innovative firms. Quite a few recent studies analyze the effectiveness of such policy schemes, most of them applying matching techniques to identify a comparable group of firms i.e,. a control group. Autio and Rannikko (2016) find that a Finnish policy scheme targeted at high growth entrepreneurship more than doubled the growth rates. Investigating a program providing R&D subsidies to Korean SMEs, Cin et al. (2016) conclude that the subsidies increase the expenditure on R&D as well as firm productivity. In the UK, Foreman-Peck (2013) finds that firms which received support from the UK state support programmes for innovation grew significantly faster than other innovative firms. The state-supported innovation programmes typically involved grants from the state, but in addition, a system of tax credits for innovative activities was also implemented. Lerner (2000) finds that the Small Business Innovation Research Program in US was additional in terms of private capital, and that the program increased the sales and employment growth for high-technology firms. In contrast, based on an effect study of a program providing subsidies to early stage innovative ventures in Sweden, Norrman and Bager-Sjögren (2010) conclude that the program has not been additional, and moreover that the scheme has not been successful in identifying potentially successful firms.

2.3. Venture capital

In the private market, venture capital funds are the most professionalized capital instrument targeted at financing early stage innovative companies with high growth professionals. Venture funds offer capital, professional business advice as well as a business network in return for equity stakes in companies. The business model is that the fund should exit the company at the point where the largest growth potential is revealed to the market, hopefully with a high return on its investment. Kortum and Lerner (2000) find that venture capital accounts for a large share of investments in industrial innovations in the United States. The venture capital market in Europe is, however, far less developed (Bottazzi and Da Rin, 2002). Thus, public policy schemes creating hybrid venture funds or co-investment venture funds are popular financial instruments to promote high growth entrepreneurship. Hybrid refers to funds backed by both private and public funding, while co-investment funds are publicly backed funds whose mandate is to match private venture capital investments. The results from evaluations show that the effects of such public policy initiatives are ambiguous.

Wonglimpiyarat (2016) is one of several papers that emphasize the establishment of the Yozma venture funds, a public backed fund co-investing in private venture funds, as a key factor in triggering the currently thriving venture industry in Israel. Investigating the sales growth of close to 800 European venture portfolio companies, Grilli and Murtinu (2015) find that government administrated venture capital funds underperform compared to private funds. However, when investigating the performance of young venture portfolio companies they find no statistical significant differences between government- and privately administrated funds. Based on the same data set, Cumming et al. (2014) find results indicating that private funds are more likely to have positive exits than government-backed funds. The authors do not find any statistically significant differences in the likelihood of a positive exit between private funds and that of mixed syndicates of private independent and governmental venture capital. Studying six UK hybrid venture funds, Nightingale et al. (2009) identify a modest positive effect on portfolio company performance measured in terms of sales, employees and fixed assets relative to a matched a control group. While they identify an interesting J-curve pattern over time with respect to the development in profit margins and labor productivity, the effect on these variables are not statistically significant. In a comparative analysis of public and private venture capital funds in the UK, Munari and Toschi (2015) find that a significant reduction in private venture capital has been offset by increased access to public venture capital. However, their results indicate that the public venture funds are less likely to lead to a positive exit of the

portfolio company, as well as less effective in attracting additional venture capital investments to the company. This goes in particular for public venture funds that have constraints with respect to which geographical regions they may invest in.

In a study of the Australian public Innovation Investment fund, Cumming (2007) finds that the program has improved the access to capital for innovative firms. Moreover, he does not find any statistically significant differences between the public venture capital and private venture capital in the likelihood of positive exits. Still, the conclusion with regards to exits is premature as the majority of investments have not been exited. In Norway, the State Audit Institution found that none of the 15 seed and venture funds, partly funded with subsidized governmental loans, have succeeded in bringing forward high growth companies with more than 50 employees over the 16 year period 1998- 2014 Riksrevisjonen (2016). In an effect study of eight Swedish co-investment venture funds backed by public funding, Damvad (2016) finds that the portfolio companies have moderately higher growth in sales, productivity and employees than the matched control group four years after the initial investment. The funds started investing as late as 2009, so the evaluation emphasizes that it is too early to conclude on performance.

2.4. Tax credits

Some countries also use the tax system to give incentives to early stage firms and innovative projects in SMEs. Based on a country level panel data study of nine OECD countries over a period of 19 years, Bloom et al. (2002) find evidence that tax incentives, reducing the cost of capital of R&D, are effective in increasing R&D intensity. Recent firm level effect studies of country specific R&D tax credit schemes provide more ambiguous results. Cowling (2016) investigates the effect of the UK tax credit scheme to promote and support R&D. He finds that the progam seems to have a positive effect on radical process innovations, while it does not seem to have any effect on the level of product and service innovations. In a similar study based on the Norwegian tax credit scheme for R&D activities, Cappelen et al. (2012) find the opposite, that the tax credits have a positive effect on process and (to some extent) incremental product-service innovation, but no effect on radical innovation or patenting. Evidence from Canada, however, points to that R&D tax credits have a positive impact on innovation outputs including product innovations and sales growth, as well as radical innovations Czarnitzki et al. (2011). Lokshin and Mohnen (2012) find that the Dutch tax credit scheme leads to an increase in R&D investments, but that the crowding-out effect can only be rejected for small firms.

Tax credit policy schemes are typically allocated automatically, meaning that every firm that fulfils the requirements indicated by law, is eligible for the tax credit. In comparison, credit guarantees, grants and venture capital investments are typically selective schemes, in the sense that they provide R&D subsidies directly based on careful assessment of an application for financial support. In a study of Italian young innovative firms, Colombo et al. (2013) compare firms' employment growth in firms that have received support from selective schemes, with firms receiving support from automatic schemes. They find a statistically significant higher employment growth for firms with selective support given that the finance is provided in the very early period of the firms' lives. The authors point out that one explanation of the differences could be that selective schemes have an additional certification effect for young firms, improving their access to finance. A challenge with this type of study is that most firms have received support via the automatic scheme, making it hard to find a proper control group.

3. Startups, and growth entrepreneurs in Norway

In this chapter we define startups and explore alternative definitions for startups with high growth, also labelled growth entrepreneurs. There exists a large variety of definitions for a startup, and entrepreneurs as well as growth entrepreneurs, like gazelles or high-growth firms, yet no definition is viewed as preferred or superior in the literature on entrepreneurship. Definitions are chosen on the basis of relevance.

In this paper we are focusing on the effect of public sector subsidies on private investments, given certain characteristics of the firms. Moreover, we are considering whether such subsidies have a stronger effect on firms that already have **obtained** a certain growth rate in revenues as compared to firms that grow slow or not at all. Alternatively, we formulate specific characteristics of firms that resemble what normally is viewed as providing a **potential** for future growth.

Our definitions are based on characteristics that are identifiable using accounting variables and firm information provided by the Norwegian firm account registry. This way, our definitions are operational, enabling us to count the number of startups that sort under the alternative definitions.

3.1. The definition of a startup

We define a startup in the following way. A startup company is a company that has registered economic activity for the first time during the period 2006-2010.With first year economic activity (start up), we require that at least one of the following criteria is reached

1. The first year with registered revenues
2. The first year with registered operational costs

The reason why we use activity as a startup definition and not the date of firm establishment is that a large number of firms in Norway are started up for other purposes than economic activity. For several reasons, entrepreneurs may also wait a long time after registering before they actually start up a new venture. The cost of establishing a new firm is relatively low, increasing the likelihood of a startup that sleeps the first years. Finally, several companies are made inactive for a longer period and then restarted with a new entrepreneur. If firms are inactive for 3 years or more, a new year of activity is treated as a startup here.

We apply a unique database covering all startups in Norway during the period 2006 and 2010. By focusing on this period, we can follow their activity, their accounts and their balance sheets to 2015, i.e at least 5 years after startup.

In figure 1 below, we report the number of startups. All together we have registers 126.342 startups during these five years. The reason for a falling number of startups over time is that companies being inactive for more than two years, and then becoming active are picked up the first time in 2006. Hence such startups become less frequent later in the period.

Table 1: Number of startups in Norway 2006-2010

Number of startups per year		
Year	Number	Percent of all
2006	42 353	34
2007	26 318	21
2008	23 546	19
2009	17 138	14
2010	16 987	13
Total	126 342	100

3.2. Definition of growth entrepreneurs

This paper is guided by a research mandate that requires a focus on startups or early stage firms that display a strong ability to grow in terms of economic activity. Hence, we have chosen to focus on two aspects of growth:

- Obtained growth
- Potential growth

The two categories of startups are mutually exclusive. If a startup has obtained growth, it can not be a potential growth firm.

3.2.1. Definition of startups with obtained growth:

We define start ups having "obtained growth" if they report an annual growth rate of 10 percent over the first 5 years. In addition, they must report at least 500 000 NOK in value added per employee in year 5. This way we exclude companies with strong but unsustainable growth, and companies that grow fast in percentage terms but are extremely small. This definition is based on a study of entrepreneurship in Norway where startups were categorized according to growth and productivity (See Menon, 2015).

3.2.2. Definition of startups with potential growth

Due to the research mandate, we are also searching for startups that are expected to grow faster. Such expectations do not necessarily correlate with subsequent growth, yet industrial policies often rest on such criteria: We identify startups with potential growth according to the following criteria:

a. *J-curve startups 1: Operational loss of minimum 1 mill. kroner (accumulated) over the first 5 years, and no revenues*

b. *J-curve startups 2: Operational loss that amounts to the double of accumulated revenues over the first 5 year,*

c. *Innovative startups 1: Firms that have been awarded R&D tax credits (Skattefunn) at least once during the first 5 years.*

d. *Knowledge intensive startups: All startups that sort under NACE-codes (5 digit) where the share of employees with more than a bachelor degree exceeds 30 percent.*

e. *High-tech startups: Startups that belong to industries (NACE-codes) that are categorized as high tech according to definitions by Statistics Norway*

f. *Innovative startups 2: Startups that figure in the portfolios of seed and venture funds (both state supported and pure private early stage investment funds)*

In figure 2 below, we present the number and fraction of startups during the period 2006 to 2010 that qualify as companies with obtained growth and potential growth.

Table 2: The number of growth startups in the population

Summary statistics			
	Criteria	# of startups	Share of all startups
Obtained growth		5 078	4,0 %
Potential growth	a) J-curve criteria 1	1 575	1,2 %
	b) J-curve criteria 2	3 634	2,9 %
	c) Has received R&D tax credits	1 635	1,3 %
	d) Knowledge based industry	13 227	10,5 %
	e) Tech-industry	14 076	11,1 %
	f) Seed and Venture capital	136	0,1 %
	Total	34 283	27,1 %

Approximately four percent of all startups have obtained growth according to our criteria. Our definitions of potential growth includes approximately 1 out of 4 startup companies, thus fulfilling the criteria for being a potential growth entrepreneur is much easier than actually obtaining growth. Most of the potential growth startup companies are qualified because they are a part of the knowledge based industry or tech-industries. Over 20 percent of all startups belong to these industries.

4. Government subsidies for startups

4.1. Data source and selection of schemes

As outlined in the literature survey, there are broadly speaking four types of policy schemes that are relevant for entrepreneurs: Grants, loans/guarantees, equity investments/venture capital and tax credits. In Norway, the government offers all these measures to the business sector. Most of the measures are aimed at subsidising R&D and innovation activities, but startups are also offered project support that may not require investments in R&D and innovation.

The Ministry of Industry and Fishery has established a new database covering all government support schemes directed towards the business sector over the period 2000 – 2016. The database is labelled «the Interplay DataBase» and covers measures administered by 16 government agencies directed towards 650 000 firm-year combinations[1].

By combining the interplay database with the firm accounting database, we can study the distribution of subsidies at the firm level, based on a population panel of startups.

4.2. The distribution of subsidies to startups

In total 6079 of the startups identified have been offered one or more government support treatments during the period 2006-2015. Since we have applied participation in tax credit schemes as a selection criteria for being defined as a potential growth entrepreneur, we cannot view this this tax credit as a policy treatment. Consequently, the number of firms treated is cut further to a 5010. As outlined in Table 1 below, this amounts to 4 percent of all startups during this period.

Table 3: Number of firms with treatment in the dataset

	All startups	Obtained growth	Potential growth
# of firms	126058	5051	29006
Share of all startups	100 %	4 %	23 %
Treatment	5010	492	1770
Treatment share	3,97 %	9,74 %	6,10 %
Grant share	2,19 %	4,93 %	3,25 %
Loan & Guarantee share	0,41 %	0,59 %	0,35 %
Other treatment share	1,38 %	4,22 %	2,51 %

Grants	2 755
Advice	718
Profiling	50
Loans and guarantees	519
Equity schemes	71
Multiple treatment	897
Total with treatment	5 010
No treatment	121 048
Total	126 058

In the group of startups that have obtained growth, the treatment share is more than doubled as compared to the share in the total population of startups, while the treatment share in the group of potential growth entrepreneurs is approximately 50 percent higher. A large number of firms have received multiple treatments

[1] The interplay database covers government activities administered by Argentum (2001-2016), Eksportkreditt (2011-2016), Enova (2002-2016), EU 7. framework (2007-2016) , FHF (2001-2016), Counties (2007-2016), Giek (2011-2016), Horizon 2020 (2016), Innovasjon Norge (2000-2016), Investinor (2009-2016), Research council of Norway (2000-2016), Norwegian Space Agency (2014-2016), Regional research funds (2010-2016), Siva (2009-2016), SkatteFUNN (2002-2016), Seed funds (1998-2016)

after starting up. We have sorted the treated firms into four broad treatment groups. The first three categories are

a. Grants
b. Loans/guarantees
c. Other treatments (advice, profiling, equity)

If a firm has been treated once, it falls into one of the categories a-c. If a firm has been treated more than once, by obtaining for example both grants and loans/guarantees, it falls into the fourth and final group:

d. Multiple treatments

In the case of multiple treatments, where one treatment is much larger in terms of financing than the others, and also is registered as the first treatment, we chose to keep the startup in one of the treatment groups a-c-.

In table 3 (right side panel) we report the distribution of treatments, The most common treatment is a single grant, representing half of the firms.

5. Empirical modelling of treatment effects

Our objective is to measure the effect of a firm receiving subsidies (treatment) on subsequent equity investments in the firm. We concentrate on the supply of Accumulated Equity Issue Proceeds (AEIP) as we are less concerned about the supply of capital through retained earnings. In other words, we are interested in studying the links between public support schemes and access to new private equity. In this study, we do not distinguish between equity investments from existing investors and equity investments from new investors, sltough this would be a highly interesting aspect to look into.

It would be possible to attack this question by analyzing the level (or flow) of equity into the firm in the period before the subsidy is received with the level after the subsidy is received. However, as new firms are likely to have an upward trend in equity investments, such a before-after comparison would yield results that are difficult to interpret. In order to take into account trends in equity investments for startup, we define a control group of "similar" startups that have not receive subsidies (not treated). The empirical question we try to answer is whether the before-after differences for treated firms is larger than the before-after differences for control firms. To conduct such a test, we use a difference-in-difference (DiD) estimator.

There are different ways to define a control group of firms. One way is simply to run a DiD regression using all the non-treated firms in our database, but controlling for firm characteristics such as size, industry, age etc. In order to have a control group that is more directly comparable to the treated group as our benchmark specification, we use a propensity matching approach, where we for each treated firm find a similar control firm (a "twin"), and then run a DiD regression only on the treated firms and the matched controls. We require control firms to be started up in the same year as the treated firms.

Also, we must construct a "treatment year" for a control firms using the treated year for the treated firm. This way we compare the flow of equity to two similar startups, before and after the year that one of the firms was treated. In the matching procedure we use treated firm characteristics in the year before the subsidy was received. We do this to avoid contaminating our "treatment effect" estimates with potential pre-treatment effects.

In order to assess our results for robustness we also apply two other DiD approaches. In the first alternative approach we use all the non-treated firms in our database, not only the matched firms. In the second approach we assess for robustness is a matching approach where we allow each control firm to be used more than once in the matching. It turns out that our results are highly similar across these three methods. Consequently, we report only the benchmark regressions. The other regression results are available upon request.[2]

One potential worry about this procedure is that as a treated startup firm per definition is active in the year of treatment, the matching procedure does not ensure that the "twin" firm is active, because the matching procedure selects on year t-1 characteristics. To ensure that our results are not driven by this mechanic attrition effect, we have run specifications where we match both on t-1 characteristics and on whether the firm is alive in the treatment year or not. These regressions yielded very similar results and are not reported, but are available upon request.

[2] In the benchmark regressions, for each potential control firm we sample a firm-year randomly before running the matching procedure. This ensures that a control firm is used only once. The alternative approach is to match on firm-years, which implies that a control firm can be used more than once. We use the psmatch2 procedure in Stata.

Another issue we are confronted with in the benchmark procedure is that almost a third of treated firms are started up in the treatment year, and thus do not have year t-1 characteristics available in the database. To deal with these firms, we run separate regressions where we match on characteristics in year t. The results for this group of firms are very similar to the main group of firms (where we do have t-1 characteristics).

In the DiD regressions (i.e., after matching, so that only treated and matched control firms are included) we include as control variables the same variables that we used in the matching stage. This 'bias-corrected' matching has been found in Abadie and Imbens (2006) to work well in practice. As the matching yields two groups of firms, treated and matched controls, that are very similar, dropping these control variables yield very similar results to the ones reported.

In the benchmark matching procedure, we have identified relevant matches for 4157 treated startups out of 5010 treated startups overall. In the table below we report some key characteristics of these firms. The median turnover in the treated firms is close to 1 million NOK, which is a fairly small size. AEIP is no more than 200 000 NOK, and the median firm employs less than 1 person. The firm that represents the 10 percent largest activity (p90), has a sale of 22,5 million NOK, and 11 employees. Such a distribution is well known for startups, as most firms never grow much.

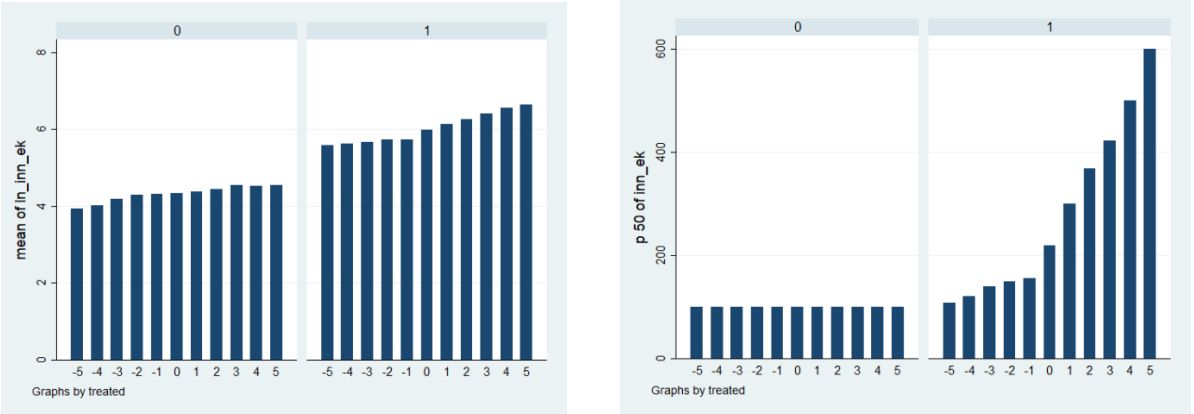
Table 4: Summary statistics of matched treated firms

	p10	Median	p90
Turnover (NOK)	0	1 051 000	22 557 000
AEIP (NOK)	100 000	200 000	5 762 000
Employees	0	0	11

6. Results

In this chapter we report the results of our tests on the links between government support schemes and the supply of new equity to startups in Norway. As an introductory illustration, we present a visual presentation of the average and median growth in such equity capital (AEIP) from 5 years before to 5 years after a treatment is given to the treated startup. The left side in both figures represents the control firms (not treated) while the right side figure represents the treated firms. We see a clear shift in the growth of AEIP after treatment which is not observed in the control group. The difference is clearly stronger for the median firm than for the average firm.

Figure 1: Left) Average AEIP for control group (0) and treated firms (1) before and after treatment year.
Right) Median AEIP for control group (0) and treated firms (1) before and after treatment year.



6.1. Estimates

In table 4 below we report estimated effects of public support on Accumulated Equity Issue Proceeds (AEIP) when we lump all types of treatments together. AEIP is in logarithms, allowing us to interpret coefficients as percentage change due to treatment. The regression for group 1 compares treated startups with matched startups selected from all startups in Norway during the observation period. In the second row we conduct tests only on startups that are classified as growth entrepreneurs (either obtained or potential growth). In the third row, we limit the startup universe further, focusing solely on startups categorized as "potential growth entrepreneurs". The fourth row reports effects of treatment only for firms that have obtained growth.

Table 5: Econometric tests for AEIP using baseline matching procedure

	Group 1	Group 2	Group 3	Group 4
	All startups	All growth startups	Potential growth	Obtained growth
VARIABLES	Equity (AEIP)	Equity (AEIP)	Equity (AEIP)	Equity (AEIP)
Treatment effect	0.373***	0.507***	0.593***	0.0824
	(0.0514)	(0.0706)	(0.0761)	(0.150)
Constant	4.468***	2.270***	5.600***	1.749***
	(0.545)	(0.109)	(0.107)	(0.0960)
Observations	46,267	20,094	14,221	5,450
R-squared	0.042	0.084	0.105	0.057
Number of treated firms	4,157	1,870	1,428	487
Year FE	YES	YES	YES	YES
Sector FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Sample	1	4	2	3
Method	match_soph	match_soph	match_soph	match_soph

Treatment is found to contribute strongly to the supply of new equity to the startups in three out of four models. The results are highly significant and they are stable for alternative matching procedures (see chapter 5 for a discussion).[3] Interaction with the government through a support scheme raises the supply of AEIP with close to 50 percent. However, the effect varies considerably depending on what group startups are classified under. The strongest effect is reached in the group with potential growth entrepreneurs.

The only group where treatment is not significantly related to subsequent supply of AEIP is the group of startups that have "obtained growth" during the first 5 years. One may interpret this as if treatment does not affect supply of equity capital to firms that are successful. However, there is ample reason to expect that firms that already run operational surpluses chose to finance their projects with a combination of public subsidized capital and retained earnings. This is consistent with the pecking order theory Myers and Majluf (1984) of project finance.

[3] *The coefficients underestimate the marginal effect of treatment.*

Table 6 Econometric tests for AEIP specified for types of public sector support scheme

	Group 3	Group 4
	Potential growth	Obtained growth
VARIABLES	Equity (AEIP)	Equity (AEIP)
Multiple treatments	0.992***	0.527**
	(0.124)	(0.261)
Grants	0.473***	-0.122
	(0.0831)	(0.156)
Loans/Guarantees	0.693***	-0.233
	(0.216)	(0.224)
Other	0.224**	0.350
	(0.0954)	(0.246)
Constant	5.591***	1.641***
	(0.107)	(0.0996)
Observations	14,221	5,450
R-squared	0.112	0.063
Number of treated firms	1,428	487

In Table 5 above we report the estimates for alternative treatments (support schemes). Here we concentrate on the group of startups that are labeled "obtained" or "potential" growth entrepreneurs. Notice though that the results for all treated startups are similar to the results for the potential growth startups. The tests show that all forms of treatments have a statistically significant effect on AEIP when we look at the potential growth entrepreneurs. The strongest effect is reached with multiple treatments. For those startups who have obtained growth (reported in the second row) only multiple treatments appear to have a positive effect, and the significance level is weak.

Table 7 Econometric tests for AEIP: Only public sector support scheme without private matching requirements

VARIABLE	Equity (AEIP)
Treatment effect	0.474***
	(0.0746)
Constant	4.873***
	(0.0427)
Observations	21,815
R-squared	0.047
Number of treated firms	2,235
Year FE	YES
Sector FE	YES
Firm FE	YES

Several government support schemes require that firms provide private financing that matches the government subsidy. Such conditionality represents a problem of reverse causality since the supply of private capital is the condition for government subsidies. In order to accommodate the possibility of such reverse causality, we have performed the analysis on entrepreneurship grants from Innovation Norway, where such conditionality is not a part of the selection criteria, although it is normally considered as an advantage. This limitation cuts the number

of startup firms that are included in the study to approximately half. As shown in table 6, the treatment effect remains large and significant. This indicates that the reverse causality is not driving our results.

6.2. Results from a brief investor survey

In the statistical analysis outlined above, we are unable to identify strong causal mechanisms linking government subsidies to the subsequent supply of private capital, as mentioned in the introduction. Our econometric tests are merely designed to establish empirical correlations between subsidies and subsequent flows of private equity capital. To claim a clear causal relationship, we would either need experimental data or the presence of a specific policy reform that by chance randomly affects some of the startups. Since we have not identified such a reform, we have conducted a brief investor survey, asking early stage investors in Norway to what extent subsidies is viewed as a signal of firm quality and to what degree they are inclined to invest more if government subsidies are offered to a firm.

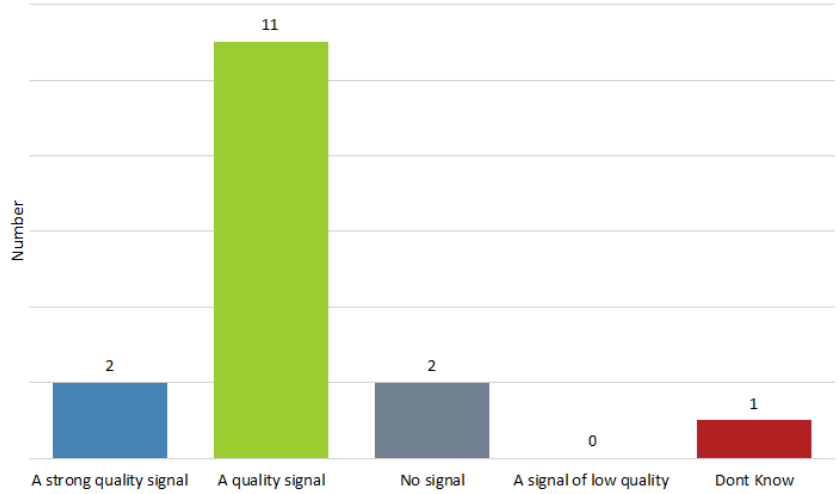
The survey was directed towards 34 investors that operate in private venture/seed funds and TTO-organization. We received answers from 16 investors.

Table 8: Summary statistics for early stage investor survey

Respondents	Number of answers	Response rate
Venture/seed	9	36 %
TTOs	7	78 %
Total	16	47 %

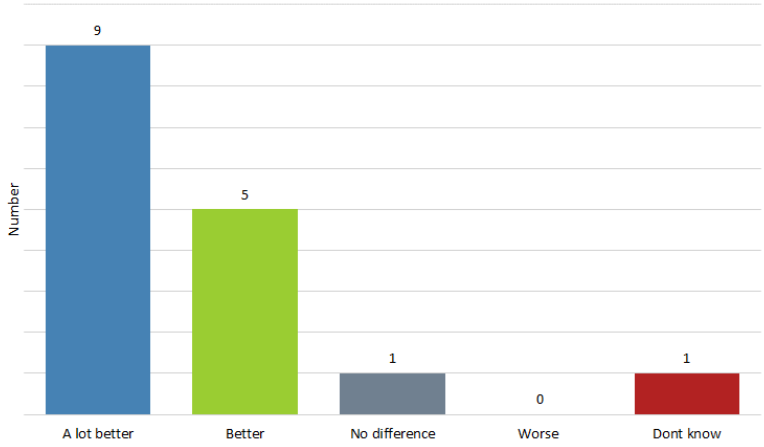
11 out of 16 investors claimed that government supported policy schemes are to be viewed as a signal of quality for the startup firm (see the figure below). This rather limited survey indicates that government grants, loans, guarantees etc. may raise the interest among investors due to a signal of higher project quality. The answers are in other words consistent with the empirical findings in the econometric exercise.

Figure 2: Do you regard being awarded a government grant, loan or guarantee as a signal of startup quality?



In addition, we asked the investors to what extent startup firms that are awarded such subsidized capital do better in terms of performance. 14 out of 16 investors claim that startup firms that are part of one or more policy schemes do better. Based on this response, one should expect to find a strong correlation between government support and subsequent growth in key performance indicators. This question is left to be discussed in a later paper.

Figure 3: What is your experience as to whether startups with government grants, loans or guarantees perform better than others



7. Conclusions and policy recommendations

This paper has presented an empirical analysis of the links between public support to startups in Norway and subsequent supply of new private equity capital to these firms. Moreover, we are considering whether such subsidies have a stronger effect on firms that already have **obtained** a certain growth rate in revenues as compared to firms that grow slow or not at all. Also, we formulate specific characteristics of firms that resemble what normally is viewed as providing a **potential** for future growth, and test whether startups with such characteristics receive more equity capital after obtaining public support as compared to other startups. We have applied a unique database covering all startups in Norway during the period 2006 and 2010 and have linked the database to a recently established public policy database for Norway covering all firm level state support schemes during the same period.

The econometric tests indicate that public support to startups is followed by significantly higher growth in new equity capital in the years following treatment. This result is robust for alternative econometric specifications, yet it is not robust for choice of startup groups. Startups in the group "obtained growth" do not display any stronger growth in supply of new equity capital post treatment, whereas all other startups do. This finding may indicate that firms that have obtained growth already have sufficient access to private capital. Their financial track record is a clear signal of quality to the market, hence a signal through a public support scheme does not affect private willingness to invest. Alternatively, one should expect that firms that already run operational surpluses chose to finance their projects with a combination of public subsidized capital and retained earnings. In that case, they do not need new equity capital. This is consistent with the pecking order theory Myers and Majluf (1984) of project finance. In both ways, one should not find a significant correlation between public support and subsequent supply of equity capital.

Other firms that have not obtained similar growth appear to experience significantly stronger growth in access to new equity capital if they have been awarded government support. This is especially so for the potential growth startups. One may argue that this result is consistent with the idea that participating in a public sector support scheme is viewed as a sign of quality among private investors. Our small-scale early stage investor survey provides strong support for this hypothesis. However, one cannot rule out that there exists channels though which a reversed causality plays a central role. Many public support schemes require a preannounced willingness among private investors (either internal or external) to cofinance a project before funds are offered. In this study, we have tried to control for such reversed causality by excluding support measures that explicitly operates with such requirements. Nevertheless, such requirements may also be expressed indirectly in other schemes. Neither can one rule out the possibility that the subsidy allows the entrepreneur to initiate a project that he or she is able to partly finance. Hence, it is not a question of public support as a signal of quality for external investors, but rather a financial opportunity to fund a project.

The study gives support to early stage government funding as a tool for enlarging the supply of private sector equity capital. In this way, these instruments may resolve some of the market failures that startups struggle with. It is however a significant problem that firms with a certain track record of growth do not appear to need such support. Hence the government is left with a large group of potential growth companies that is hard to select from. From a research perspective, it is necessary to refine this study in order to split between supply of new internal and new external capital. This way, we can further explore where the market for early stage capital hurts the most, and whether different support schemes actually propel the supply of external equity capital.

List of references

Abadie, A. & G. W. Imbens (2006). Large Sample Properties of Matching Estimators for Average Treatment Effects. *Econometrica*, 74, 235–267.

Acs, Alstebro, Audretsch and Robinson (2016): *Small Business Economics*, 47 (1), 35–51

Autio, E. and Rannikko, H. (2016). Retaining winners: Can policy boost high-growth entrepreneurship? *Research Policy*, 45(1):42_55.

Becker, S. O. and Hvide, H. K. (2013). Do entrepreneurs matter? Available at SSRN 2199645.

Berglann, H., Moen, E. R., Røed, K., & Skogstrøm, J. F. (2011). Entrepreneurship: Origins and returns. *Labour Economics*, 18(2), 180-193.

Bloom, N., Gri_th, R., and Van Reenen, J. (2002). Do r&d tax credits work? Evidence from a panel of countries 1979_1997. *Journal of Public Economics*, 85(1):1_31.

Boschi, M., Girardi, A., and Ventura, M. (2014). Partial credit guarantees and SMEs financing. *Journal of Financial Stability*, 15:182_194.

Bottazzi, L. and Da Rin, M. (2002). Venture capital in europe and the financing of innovative companies. *Economic Policy*, 17(34):229_270.

Cappelen, Å., Raknerud, A., and Rybalka, M. (2012). The effects of r&d tax credits on patenting and innovations. *Research Policy*, 41(2):334_345.

Cappelen, Å, E. Fjærli, D.C. Iancu, M. Klemetsen, A. Moxnes, Ø.A. Nilsen, A. Raknerud og M.Rybalka (2016): Innovasjons- og verdiskapingseffekter av næringspolitiske virkemidler. Rapporter 2016/12, Statistisk Sentralbyrå.

Cin, B. C., Kim, Y. J., and Vonortas, N. S. (2016). The impact of public r&d subsidy on small firm productivity: evidence from korean smes. *Small Business Economics*, pages 1_16.

Colombo, M. G., Giannangeli, S., and Grilli, L. (2013). Public subsidies and the employment growth of high-tech start-ups: assessing the impact of selective and automatic support schemes. *Industrial and Corporate Change*, 22(5):1273_1314.

Cowling, M. (2010). The role of loan guarantee schemes in alleviating credit rationing in the UK. *Journal of Financial Stability*, 6(1):36_44.

Cowling, M. (2016). You can lead a firm to r&d but can you make it innovate? UK evidence from smes. *Small Business Economics*, 46(4):565_577.

Czarnitzki, D., Hanel, P., and Rosa, J. M. (2011). Evaluating the impact of r&d tax credits on innovation: A microeconometric study on Canadian firms. *Research Policy*, 40(2):217_229.

Damvad (2016). Underlagsrapport 1 kvantitativ studie - deskriptiva data och modell för effektutvärdering av portföljföretag. Underlagsrapport till Rapport 2016:03.

Fjærli, E., Iancu, D. og Raknerud, A. (2013): Facts about entrepreneurship in Norway: Who become entrepreneurs and how do they perform? Report nr 52/2013

Foreman-Peck, J. (2013). Effectiveness and efficiency of SME innovation policy. *Small Business Economics*, 41(1):55_70.

Grilli, L. and Murtinu, S. (2015). New technology-based firms in Europe: market penetration, public venture capital, and timing of investment. *Industrial and Corporate Change*, 24(5):1109_1148.

Grünfeld, L., Grimsby, G., Høseth-Gilje, Hvide, H., Lian, K. O., Steinsvik, H., and Vinogradov, E. (2013). En statlig bro i kapitalmarkedet: Evaluering av Innovasjon Norges låne- og garantiordninger. Menon publication, (42/2013).

Jacob, Brian and Lars Lefgren (2011). The Impact of Research Grant Funding on Scientific Productivity. *Journal of Public Economics*. 95(9-10), 1168-1177.

Kortum, S. and Lerner, J. (2000). Assessing the contribution of venture capital to innovation. *RAND journal of Economics*, pages 674_692.

Lelarge, C., Sraer, D., and Thesmar, D. (2010). Entrepreneurship and credit constraints: Evidence from a french loan guarantee program. In International differences in entrepreneurship, pages 243_273. University of Chicago Press.

Lerner, J. (2000). The government as venture capitalist: the long-run impact of the SBIR program. *The Journal of Private Equity*, 3(2):55_78.

Lerner, J. (2009). Boulevard of broken dreams: why public efforts to boost entrepreneurship and venture capital have failed and what to do about it. Princeton University Press.

Lerner, Josh (1999). The Government as Venture Capitalist: The Long Run Impact of the SBIR Program, *Journal of Business*, 72(3), 285-318.

Lokshin, B. and Mohnen, P. (2012). How effective are level-based r&d tax credits? evidence from the Netherlands. *Applied Economics*, 44(12):1527_1538.

Menon (2012): Akademikere som entreprenører i Norge: Omfang og betydning for vekstbedrifter, Menon Publikasjon nr 10/2012, Oslo

Menon (2015): En million ideer: Veien fra drøm til å lykkes som gründer, Rapport for DNB. http://www.menon.no/wp-content/uploads/20en-million-ideer.pdf

Menon (2016): Selvstendig næringsdrivende i Norge. Hvem er de og hva betyr de for fremtidens arbeidsmarked? Menon-publikasjon nr 14/2016

Munari, F. and Toschi, L. (2015). Assessing the impact of public venture capital programmes in the United Kingdom: Do regional characteristics matter? *Journal of Business Venturing*, 30(2):205_226.

Myers, S. C. and Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of financial economics*, 13(2):187_221.

Norrman, C. and Bager-Sjögren, L. (2010). Entrepreneurship policy to support new innovative ventures: Is it effective? *International Small Business Journal*, 28(6):602_619.

OECD (2009). The impact of the global crisis on SME and entrepreneurship financing and policy responses.

Oh, I., Lee, J.-D., Heshmati, A., and Choi, G.-G. (2009). Evaluation of credit guarantee policy using propensity score matching. *Small Business Economics*, 33(3):335_351.

Ono, A., Uesugi, I., and Yasuda, Y. (2013a). Are lending relationships beneficial or harmful for public credit guarantees? evidence from Japan's emergency credit guarantee program. *Journal of Financial Stability*, 9(2):151_167.

Riksrevisjonen (2016). Riksrevisjonens undersøkelse av såkornfondenes resultater. Dokument 3:8 (2015_2016).

Wonglimpiyarat, J. (2016). Government policies towards israel's high-tech powerhouse. *Technovation.*

Appendix

Definition overlap in population of startups

		J-curve 1		
		0	1	Total
Obtained growth	0	98,7 %	1,3 %	100 %
	1	100 %	0 %	100 %
	Total	98,75 %	1,25 %	100 %

		J-curve 2		
		0	1	Total
Obtained growth	0	97,01 %	2,99 %	100 %
	1	99,90 %	0,10 %	100 %
	Total	97,12 %	2,88 %	100 %

		Knowledge industry		
		0	1	Total
Obtained growth	0	90,10 %	9,90 %	100 %
	1	75,97 %	24,03 %	100 %
	Total	89,54 %	10,46 %	100 %

		R&D tax credits		
		0	1	Total
Obtained growth	0	98,83 %	1,17 %	100 %
	1	95,79 %	4,21 %	100 %
	Total	98,71 %	1,29 %	100 %

		Tech-industry		
		0	1	Total
Obtained growth	0	88,52 %	11,48 %	100 %
	1	96,85 %	3,15 %	100 %
	Total	88,86 %	11,14 %	100 %