



# Sources of capital for innovative startup firms

An empirical study of the Swedish situation

Anna Söderblom & Mikael Samuelsson



ENTREPRENÖRSKAPS  
FORUM

# **SOURCES OF CAPITAL FOR INNOVATIVE STARTUP FIRMS**

AN EMPIRICAL STUDY OF THE SWEDISH SITUATION

Anna Söderblom  
Mikael Samuelsson



NÄRINGSPOLITISKT  
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# Förord

Näringspolitiskt forum är Entreprenörskapsforums mötesplats med fokus på förutsättningar för det svenska näringslivets utveckling och för svensk ekonomis långsiktigt uthålliga tillväxt. Ambitionen är att föra fram policyrelevant forskning till beslutsfattare inom såväl politiken som inom privat och offentlig sektor. De rapporter som presenteras och de rekommendationer som förs fram inom ramen för Näringspolitiskt forum ska vara förankrade i vetenskaplig forskning. Förhoppningen är att rapporterna också ska initiera och bidra till en allmän diskussion och debatt kring de frågor som analyseras.

Näringspolitiskt forums nionde rapport beskriver resultaten från en studie om kapitalförsörjningen av svenska innovativa startupföretag. Då innovativa startupföretag anses spela en viktig roll i samhället är dessa centrala för tillkomsten av nya arbetstillfällen och ekonomisk tillväxt. Bristen på finansiering utpekas ofta som ett hinder för framväxt och utveckling av dessa företag.

I denna rapport presenteras de olika typer av finansieringskällor och aktörer som finns tillgängliga för startupföretag samt resultat från ett antal internationella studier som undersökt hur unga och små företag finansieras. I rapporten ges även en överblick av de teorier som är vanligt förekommande i forskning om vad som förklarar unga företags finansiering.

Den svenska staten har en framträdande roll för finansiering av svenska startupföretag och kan även förväntas ha det framöver. Författarna föreslår initiativ som underlättar för privatpersoner att investera i företag, att antalet statliga institutioner, program och initiativ som tillhandahåller statlig eller regional bör ses över samt att investeringar i större utsträckning bör tillgängliggöras för företag i något senare faser.

Rapporten är författad av Anna Söderblom och Mikael Samuelsson, båda ekonomer samt forskare och lärare vid Handelshögskolan i Stockholm. Författarna svarar själva för de slutsatser och den analys som presenteras.

Stockholm i maj 2014

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# Sammanfattning

Innovativa startupföretag anses spela en viktig roll i samhället, både för den ekonomiska tillväxten och för samhällsutvecklingen i övrigt. Dessa företag lyfts fram som centrala för tillkomsten av nya arbetstillfällen och innovation. Bristen på finansiering utpekas ofta som ett hinder för framväxt och utveckling av dessa företag. I ett antal, primärt nordamerikanska men även europeiska, studier har forskare undersökt hur unga små företag finansieras. I denna rapport presenteras resultaten från en studie om kapitalförsörjningen av svenska innovativa startupföretag. Baserat på analyser av enkätdata undersöks primärt följande områden:

- Vilka finansieringskällor som används,
- Om det finns skillnader avseende kapitalförsörjning i företagens olika levnadsfaser,
- Hur kapitalförsörjningen av denna typ av företag i Sverige förhåller sig till situationen i andra länder,
- Hur kapitaltillskotten används, samt
- Entreprenörernas inställning till olika typer av finansiärer.

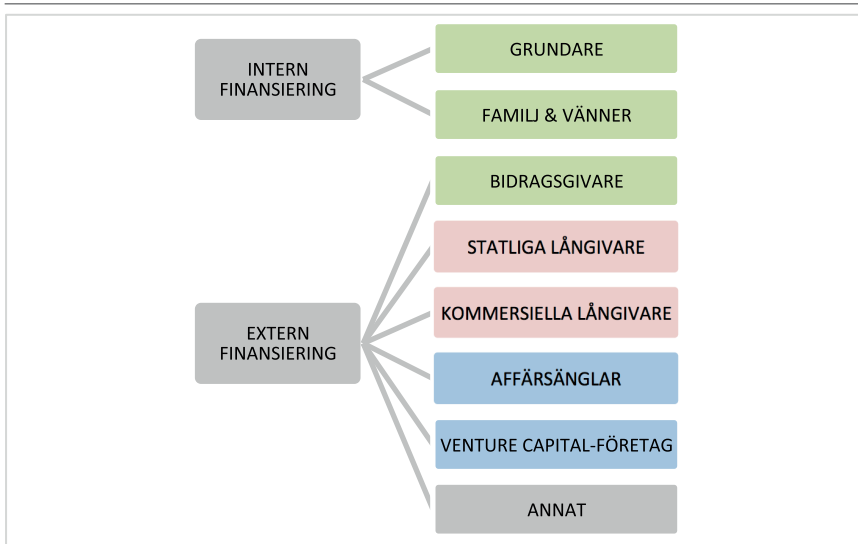
## Startupföretags finansieringskällor

Det finns olika typer av finansieringskällor tillgängliga för startupföretag. Ofta grupperas dessa till (i) interna källor, dvs finansiering som härstammar från grundaren eller från dennes familj och vänner, samt (ii) externa källor, dvs finansiering från aktörer utan nära anknytning till grundaren såsom bidragsgivare, statliga långgivare, kommersiella långgivare i form av banker och andra kreditinstitut, affärsänglar samt venture capital (VC)-företag (se Figur 1). I rapporten presenteras definitioner av dessa aktörer och finansieringskällor samt resultat från ett antal internationella studier som undersökt hur unga och små företag finansieras. Andra sätt att finansiera en verksamhet såsom genom företagsinterna aktiviteter, så kallad bootstrapping, crowdfunding eller börsintroduktioner, presenteras kortfattat men undersöks inte



närmare i studien. I rapporten ges även en överblick av de teorier som är vanligt förekommande i forskning om vad som förklarar unga företags finansiering.

**FIGUR 1.** Finansieringskällor till startupföretag



## Kapitalförsörjning av svenska innovativa startupföretag

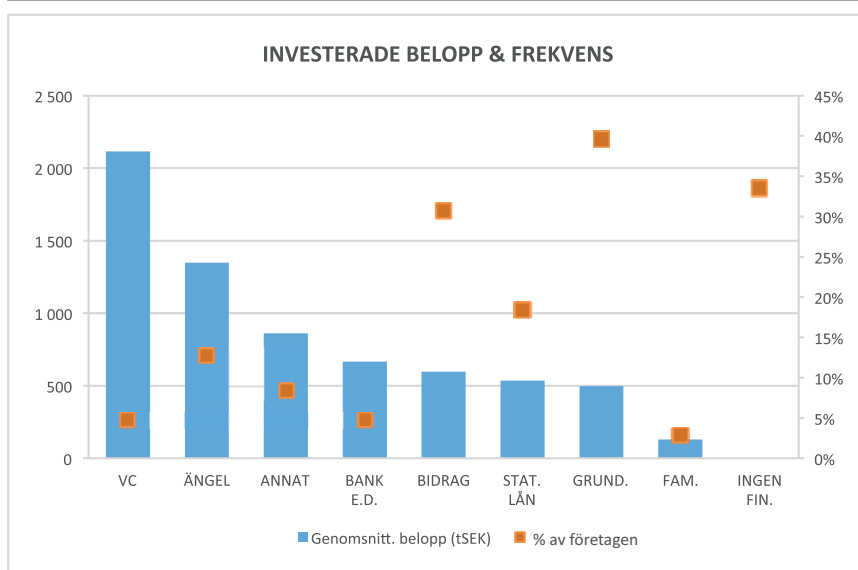
Merparten av rapporten ägnas åt att presentera resultaten från en studie av svenska innovativa startupföretags kapitalförsörjning. Sammanlagt undersöks 113 företag samt årsdata för 212 företagsspecifika observationer gällande olika typer av finansiering. Företagen klassificeras i analysen till fyra grupper beroende på företagsfas: (i) seed, vilket inkluderar företag som är yngre än ett år, (ii) startup, företag som är ett år gamla, (iii) early development, företag som är mellan två och fyra år, samt (iv) expansion, företag som är mellan fem och 12 år gamla. Några av de mer framträdande resultaten från studien är som följer.

### *Frekvens och investerade belopp*

En relativt stor andel av de undersökta företagen, ca en tredjedel, använder sig inte av någon form av finansiering utan utvecklar sina företag enbart genom företagsinternt genererade medel (se Figur 2). Den vanligaste förekommande finansiären är grundaren själv, där ca 40 procent av företagen genom ägartillskott eller lån helt eller delvis finansieras av denne. Detta är i linje med studier från andra länder, där just kapital från grundaren utpekas som den källa som används av flest nystartade företag. Vad som däremot särskiljer situationen i Sverige i jämförelse med andra regioner är de

mycket begränsade kapitaltillskott som kommer från familj och vänner. Istället är statlig finansiering, primärt i form av bidrag men också statliga lån, vanligt förekommande och utgör sammantaget en tredjedel av det totala kapitalet som investeras i dessa företag. Det är en betydligt högre nivå jämfört med andelen statlig finansiering i t ex USA-baserade startupföretag. Ett fåtal av de svenska företagen använder sig av affärsängelfinansiering och ännu färre av venture capital. När sådana investeringar görs är dock de genomsnittliga nivåerna jämförelsevis höga, vilket överensstämmer med studier från andra länder. Finansiering från banker och andra kommersiella låneinstitut är relativt ovanligt, även i de något senare faserna, vilket antyder att kommersiell lånefinansiering till unga företag i Sverige är mer sällsynt än i t ex USA.

**FIGUR 2.** Investerade belopp och användning av olika finansieringskällor. Genomsnittligt investeringsbelopp i tSEK för de företag som använt en specifik finansieringskälla. Andel av företagen som använt en specifik finansieringskälla under det senaste året. N=212.

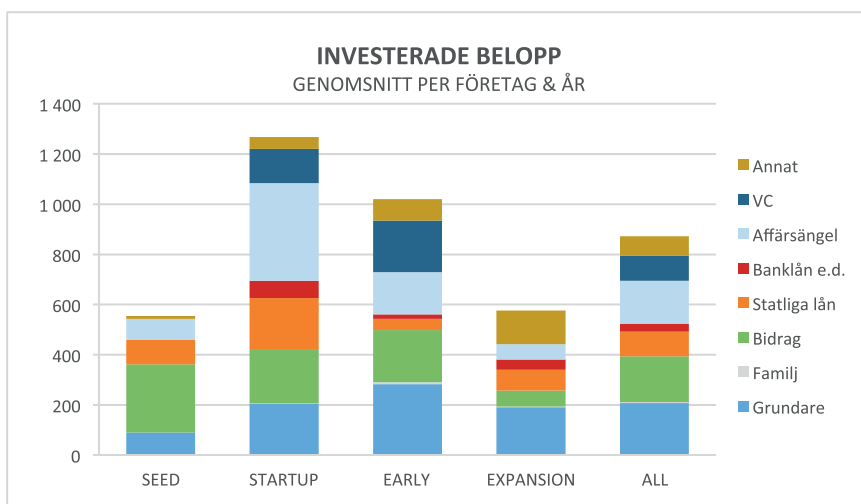


### *Olika företagsfaser*

En slående iakttagelse från denna studie är att tillgången till kapital tycks någorlunda god i företagens absolut tidigaste faser, medan bristen på finansiering är tydlig i något senare faser och speciellt så i expansionsfasen (se Figur 3). Företag i startupfasen attraherar mest kapital i genomsnitt per företag, medan de investerade beloppen eller lånenivåerna till företag i de senare faserna sammantaget är lägre. I den tidigaste företagsfasen domineras företagens finansieringsportföljer av bidrag, följt av statliga lån och kapitaltillskott från grundare. I den påföljande startupfasen ökar inte

bara antalet finansieringskällor utan också det sammanlagda beloppet. I detta skede förekommer många olika typer av finansiärer, där affärsänglar, statliga långivare, statliga bidragsgivare samt grundare står för merparten av kapitalförsörjningen. I den så kallade early development-fasen är det kapital från grundaren som är vanligast förekommande, följt av bidrag, venture capital och affärsängelinvesteringar. I expansionsfasen, där företagen alltså erhåller betydligt mindre kapital, dominerar grundarna i än större utsträckning som finansiärer genom privata kapitaltillskott medan övriga källor är relativt små.

**FIGUR 3.** Investerade belopp per företagsfas. De genomsnittliga investeringsbeloppen anges i tSEK för respektive finansieringskälla.  $N_{Seed} = 38$ ,  $N_{Startup} = 45$ ,  $N_{Early} = 73$ ,  $N_{Expansion} = 56$ ,  $N_{All} = 212$ .



### *Hur kapitaltillskotten används*

Studien visar att mer än två tredjedelar av företagen primärt använder investerade medel för att rekrytera personal för forsknings- och produktutvecklingsändamål. En tredjedel av företagen anger att de förstärker sin marknads- och säljorganisation samt investerar i aktiviteter som rör marknadsbearbetning. Rekryteringar och aktiviteter inom områdena produktion, supportfunktioner, inköp av maskiner och inventarier, etc., tycks mindre prioriterade.

### *Inställning till bank-, affärsängel- respektive venture capital-finansiering*

De företag som inte är användare av kommersiella lån från banker eller andra kreditinstitut uppgav som främsta orsak till detta att företagen är för unga och därmed

har fått eller förväntas få avslag på låneansökan samt att kostnaden för bankfinansiering anses för hög. Anledningar som framfördes för avsaknaden av affärsängelinvesteringar var först och främst oviljan att förlora kontrollen över företaget, att det inte ansågs finnas något behov för affärsänglar eller att processen med att ta in affärsänglar ansågs för komplicerad. De företag som inte hade någon venture capital-finansiering framhöll att de inte visste hur de skulle kontakta ett VC-företag eller inte såg något behov av sådan finansiering som primära anledningar till varför företagen inte använde sig av denna finansieringsform.

## Sammanfattning och rekommendationer

Denna studie undersöker kapitalförsörjningen av unga svenska innovationsföretag – de företag som ofta lyfts fram som centrala i samhället vad gäller framväxt av nya arbetstillfällen, innovation och övergripande samhällsutveckling.

Studiens resultat pekar på att de svenska innovativa startupföretagen generellt (i) är underfinansierade, speciellt i de något senare faserna, (ii) använder ett flertal olika typer av finansieringskällor, (iii) i stor utsträckning är finansierade av statliga institutioner genom bidrag eller lån, medan (iv) kapital från familj och från kommersiella lånefinansiärer är högst begränsat. Studien visar även att många entreprenörer inte är fullt förberedda för kapitalisering eller har tillräcklig god kunskap om alternativa finansieringslösningar. Vad gäller tillgångssidan är det något överraskande att bankfinansiering är så sällan förekommande i de svenska företagen även i något senare faser, medan denna finansieringsform tycks betydligt vanligare i andra länder. Studien visar också att flertalet finansiärer fokuserar på de tidigaste företagsfaserna, inte bara kommersiella aktörer som affärsänglar och VC-företag, utan även de statliga institutionerna.

Implikationer från studien på efterfrågesidan är att entreprenörer bör vara bättre förberedda när de finansierar sina bolag, t ex genom att utforma finansieringsplaner tidigt, skapa en bättre förståelse för olika typer av finansiering, vara beredda att investera tillsammans med externa finansiärer samt söka större belopp när bolagen väl förhandlar med investerare. Vad gäller utbudssidan ser vi ett behov av bättre kommunikation från finansiärer till entreprenörer, där aktörer som banker, affärsänglar och VC-företag ytterligare kan öka informationen om sina tjänster och finansieringslösningar till unga innovationsföretag.

Vad gäller policyrekommendationer är det viktigt att utgå från insikten att staten är den dominerande externa finansiären av dessa företag. Eftersom staten i Sverige har en framträdande roll på många områden är resultatet i sig inte överraskande, men bör tas i beaktande vid utformning av finansieringsprogram för unga innovativa företag. Det vill säga, politiker och beslutsfattare bör utgå från den egna nationella kontexten snarare än att imitera strategier utformade för regioner såsom USA eller europeiska länder med andra förutsättningar. Med utgångspunkt från att staten även framöver kan förväntas ha en framträdande roll vad gäller finansiering av unga innovationsbaserade företag, föreslår vi tre vägar framåt. För det första går det att

anta att grundarnas kapitaltillskott fortsatt kommer utgöra en huvudsaklig finansieringskälla till det egna företaget. Detta är inte bara en förutsättning för att de facto kunna kapitalisera företagen, utan har också ett viktigt signalvärde för andra finansier. Därmed bör initiativ som underlättar för privatpersoner att investera i företag, skattelättnader vid anställningar, etc., som redan implementerats eller diskuteras fortsätta och förbättras ytterligare. För det andra föreslår vi att antalet statliga institutioner, program och initiativ som tillhandahåller statlig eller regional finansiering i form av bidrag, lån eller riskkapital ses över och i viss mån konsolideras till ett färre antal. Detta skulle leda till ökad effektivitet för såväl investerare som entreprenörer. För det tredje ser vi ett behov av att bredda fokus för de statliga investeringarna till att inte endast allokeras till företags absolut tidigaste företagsfaser, utan även i större utsträckning tillgängliggöras för företag i något senare faser givetvis med beaktande att inte konkurrera med det privata kapitalet. Bättre tillgång till kapital även i expansionsfasen skulle snabba på företagets utveckling och därmed inte bara påverka företagen positivt utan även samhället i stort i form av ökade skatteintäkter och fler jobb.

# Executive summary

It is a widely held view that innovative startup firms play a critical role in stimulating economic growth, increasing productivity and contributing to national competitiveness. Financial constraints are often identified as major obstacles for the development of young firms. This is particularly true for innovative startup ventures, since such firms (i) often are built upon intangible rather than tangible assets and thereby the problem of asymmetric information is considered especially acute, and (ii) face a high risk of failure. As such, the matter of how these firms are financed has emerged as a central issue for policymakers and scholars alike, resulting in a growing body of research investigating the capital structures of startup firms. Although the vast majority of studies have focused on the U.S. market, the interest in investigating the financial situation for European startups has also increased. This report seeks to contribute to the stream of empirical studies on sources of capital for innovative startups by studying young Swedish firms. The study has three major objectives: first, to examine how Swedish innovative startups are financed during their earliest stages of development; second, to identify possible determinants of external capitalization of such firms; and third, to analyze the perceptions of innovative Swedish entrepreneurs pertaining to funding from commercial debt providers, business angels and venture capitalists.

In the study, we use an original sample of 113 Swedish innovative startup firms. We find capital from founders to be the primary source of funding, which is in line with existing research. However, in contrast to previous studies, we find that funding from family and friends is more or less non-existent in these ventures. Instead, the studied firms are to a large extent funded by governmental funding in the form of grants, which also differentiates the Swedish situation from many other regions. Public debt is a common source of funding, while commercial debt is relatively rare. Angel funding, and particularly venture capital, is relied upon by few ventures; however, once it has been granted, more substantial amounts of funding are likely to be received from these sources, a finding which is consistent with existing research. Moreover, there are clear variations in the patterns of availability of different types of funding during the various stages of company maturity (i.e., seed, startup, early development, and expansion). A striking finding is that the highest average amounts of capital are

allocated to firms in the startup phase, while the level of external funding decreases considerably in the later phases of firm development. Instead, investments from the founders continue to constitute the largest source of capital for more established firms. This finding was supported when analyzing determinants of external funding, where firm age has a clear negative impact on external capitalization. We suggest that this indicates a funding gap for innovative firms in their early development and expansion phases. In addition, the study shows that it is important for founders to invest own money into their businesses in order to attract external funding. We interpret this as a signaling effect, whereby founder investments signal commitment and thereby a reduction of moral hazard risk to external investors and potential lenders. Finally, both supply- and demand-related reasons were identified as factors in the decision to eschew a particular type of funding. When comparing our results with existing studies, there are both similarities and differences that may be explained by institutional variations across countries.

# Introduction

## 1.1 Financing of innovative startup firms

The role of the young entrepreneurial firm as an engine for economic growth has garnered substantial attention during the last several decades. In particular, innovative startup firms with growth ambitions are considered to contribute disproportionately to innovation, the creation of jobs, and wealth in the larger economy (Storey, 1994; Birch et al., 1995; Kirchoff and Newbert, 2007). As such, fostering the development and success of innovative startup firms has become a major objective in most countries, and policymakers have directed significant amounts of energy and resources toward finding direct or indirect methods to stimulate entrepreneurial efforts.

One area of particular focus for policymakers, practitioners and scholars alike is the nature and structure of the financial markets that fund small firms (Berger and Udell, 1998; Cassar, 2004; Denis, 2004). This interest is related to a general concern among policymakers that such firms often suffer from financial constraints due to 'funding gaps'. Whether such gaps actually exist is debatable; the academic evidence supporting this contention is scant at best (Parker, 2002; Cosh et al., 2009). Indeed, a majority of small businesses seem not to have any particular difficulties surviving by their own means or obtaining external financing (e.g., North et al., 2010). Nevertheless, certain types of small firms apparently face challenges in accessing needed funding, particularly young and innovative ventures (Beck and Demirgüç-Kunt, 2006; Blumberg and Lettierie, 2008; Cosh et al., 2009; Freel et al., 2012). Factors that may contribute to young innovative firms' vulnerability to capital constraints include high R&D costs, high proportions of intangible assets with limited collateral value, and a need for large amounts of working capital due to rapid growth (Carpenter and Petersen, 2002; Denis, 2004; Gabrielsson et al., 2004). As such, the funding of innovative startups continues to be a central concern of policymakers and scholars.

A number of both academic and practitioner-oriented studies and reports have analyzed the funding portfolios of startup firms (e.g., Berger and Udell, 1998; Bozkaya and Van Pottelsberghe De La Potterie, 2008; Robb and Robinson, 2010). The academic



papers typically have been grounded in one of two dominant theories about capital structures. The first of these is the pecking order theory, which posits the existence of a financing hierarchy stemming from information asymmetries between companies and their financiers. In this account, internal funding is preferred over debt funding, which in turn is preferred over external equity funding (Myers, 1984). For startup firms, a reverse pecking order has sometimes been suggested (Garmaise, 2001). The second predominant theory is the life cycle paradigm, which holds that funding portfolios will vary over a company's life cycle (Berger and Udell, 1998).

With only a few exceptions, the literature on this subject is dominated by U.S.-centric studies; comparable studies about the financial situation facing innovative startup ventures in European countries are still scarce. The current study aims to contribute to this small but growing body of empirical studies about the sources of funding for innovative startup firms in Europe, with the specific objective of examining the Swedish situation.

## 1.2 Research questions

Our research is motivated by eight research questions related to the funding of Swedish innovative startup firms with growth ambitions:

- Who is funding these firms?
- What is the funding used for?
- Is there a life-cycle pattern in these firms' funding portfolios?
- What determines external capitalization of these firms?
- Are there any notable differences between funding patterns for Swedish innovative startup firms and the situation facing similar firms in other countries?
- What are entrepreneurs' attitudes towards commercial debt, angel funding and venture capital?
- To what extent do equity investors focusing on Swedish innovative startups use contracts and valuation procedures to exert control?
- What are the implications for policymakers?

## 1.3 Research methodology

In addition to a literature review, the core of this report is the presentation of results from a study of Swedish innovative startup firms' use of funding sources. Data for the study were collected from a survey administered to founders and/or CEOs. The ventures were identified via the Swedish Governmental Agency for Innovation Systems' (VINNOVA) grant-based program VINN NU, which targets young innovative Swedish firms. Data pertaining to the capital sources used, and for what purposes, were collected. Moreover, respondents' attitudes towards various funding types, as well as the balance of power between entrepreneurs and investors during negotiations, were solicited. The survey was conducted via a web-based questionnaire; data were collected during the autumn of 2013. Full responses were received from 113

firms, amounting to a response rate of 34.5 percent. The cross-sectional data were thereafter statistically analyzed. Descriptive and ordinary least squares regression analyses were carried out through the use of the statistical software program SPSS.

## **1.4 Focus**

This study investigates questions related to the funding of Swedish innovative startup firms with growth ambitions, hereafter referred to as 'innovative startup firms'. The types of funding in focus include capital from founders, family and friends, business angels, venture capitalists, and grant sources, as well as from commercial and public debt providers. Funding streams stemming from prepayments from customers, trade credits from suppliers, leasing, factoring or other company-generated sources are not included in the study, nor are other external funding sources such as crowdfunding or IPOs. A glossary of common startup funding terminology is available in Appendix 1.

## **1.5 Organization of the report**

The report is organized as follows. In Chapter 2, a theoretical background is provided that elaborates upon definitions of innovative startup firms, outlines financing sources available to startup firms and presents a review of determinants identified in the literature as exerting influence on the capital structures of these firms. Chapter 3 outlines the methodology applied in the study. Chapter 4 presents the descriptive results of the study, including outlining the funding sources that Swedish innovative firms use in various phases of their development, what the funding has been used for, why certain forms of funding are not utilized, and other findings. The chapter also presents results from the regression analysis, identifying some factors that affect the level of external funding. The final chapter, Chapter 5, elaborates more on the empirical results and provides suggestions for future research, as well as recommendations to policymakers.



# Theoretical background

This chapter establishes a theoretical background for understanding the domain of financing for young ventures. The first section elaborates on how to define innovative startup firms. Thereafter, a discussion of the various funding sources available to startup ventures is offered. Finally, the two dominant theories used to explain capital structures in startup firms are discussed, together with an elaboration of other determinants impacting the funding portfolios of young ventures that have been put forward in the literature.

## 2.1 Innovative startup firms

There is widespread interest in firms that are young, innovative and have growth ambitions. Such firms are considered a particularly important engine for stimulating economic growth, productivity and national competitiveness (Birch et al., 1995; Kirchoff and Newbert, 2007). However, defining what constitutes an innovative startup firm has proven difficult for researchers, as no clear-cut and broadly accepted definition exists. Two major approaches dominate the discussion.

The first approach seeks to identify some kind of objective criteria to measure the level of a firm's novelty, typically based on Schumpeter's definition of innovation: *"What we, unscientifically, call economic progress means essentially putting productive resources to uses hitherto untried in practice, and withdrawing them from uses they have served so far. This is what we call 'innovation'"* (Schumpeter, 1928). Adherents of this approach contend that innovation is deliberate, that is, it must incorporate some form of intentional behavior (Hauknes, 1998). Furthermore, it should be new, exceeding some basic measure of novelty. Finally, it has to be at least partly codified, that is, it must constitute an objective improvement that can be measured and communicated (ibid.). This approach is particularly prevalent in technical innovation research, where researchers seek to establish some technical criteria that could be used to distinguish innovative firms from others, such as the amount of investment made into research and development, number of intellectual

property rights, patent activity, etc. (Almus and Nerlinger, 1999; Coleman and Robb, 2012; Riding et al., 2012). However, with this approach to classification, there is a risk of failing to identify firms that are innovative, but which may not qualify as such from a traditional product-centric perspective. Others have characterized all companies that operate in technology-intensive industries as innovative firms (e.g., OECD, 1997; Bozkaya and Van Pottelsberghe De La Potterie, 2008). The accuracy of this definition could be called into question as well since innovative firms do exist in other industries; conversely, not all firms operating in a high-technology environment are necessarily innovative.

The second approach defines innovation in relation to actors' perceptions and knowledge of supply and demand. For example, Van de Ven (1986) defines innovations as ideas perceived to be new by a particular organization, even though the idea may appear to be an imitation of a product or service that exists elsewhere. This approach has two chief advantages. First, this definition purposefully makes no distinction between 'technical' and 'service/administrative' innovations. This is important because such a distinction often results in a fragmented classification of innovations. Second, it makes it possible to study the opportunity from the point of recognition onward. That is, it enables the empirical observation of the venture from an early point in its development, rather than having to wait for an external event, such as a patent application. Researchers using this approach can also apply more qualitative measures, such as assessing the sophistication of the venture's product or service (e.g., Bruton and Rubanik, 2002). In this report, we adhere to the second approach, which is considered congruent with the purposes of the study.

The focus of this report is Swedish innovative startup firms with growth ambitions. Given the lack of a common definition for innovative startup firms, it is difficult to estimate the prevalence of such firms. However, by combining the findings of a few extant studies with public data, it is possible to arrive at some kind of estimate. According to GEM (2012), one percent of nascent startup firms in Sweden have an ambition to grow to more than 20 employees. The report also shows that 12 percent of Swedish startup firms are classified as being innovative with international growth potential (*ibid.*). The same percentage was identified in the PSED study (Samuelsson, 2004). This is consistent with findings from Europe, showing that between three percent and 15 percent of young firms are considered innovative (OECD, 1999). Taken together, we argue that between one percent and 12 percent of startup firms in Sweden can be classified as being innovative with growth ambitions. The methodology section in Chapter 3 outlines our choice of a representative sample of these ventures.

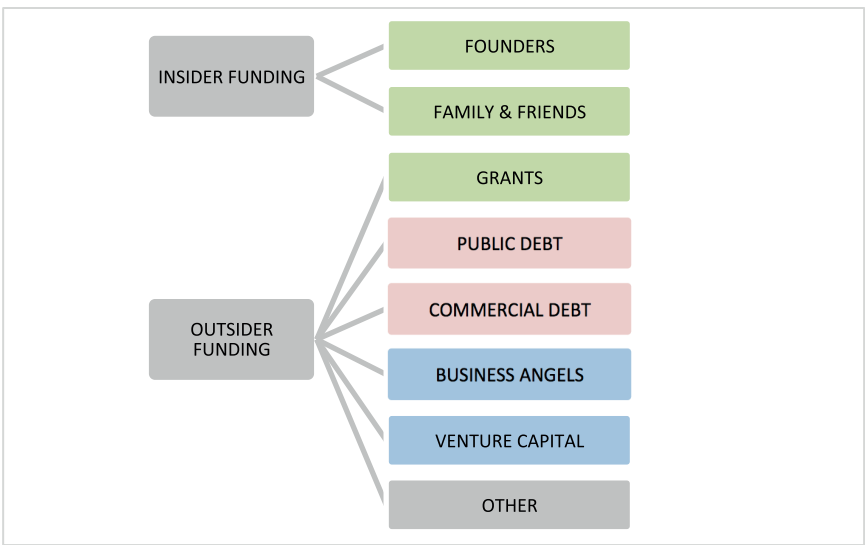
## 2.2 Funding sources for startup firms

There are a number of potential financing sources available for startup firms, including commercial banks, venture capitalists, business angels, government agencies, private individuals, leasing or factoring companies, customers, and suppliers, amongst others. The funding sources can be categorized as: (i) insider funding, stemming from the

founders themselves or from closely associated family and friends, and (ii) outsider funding from actors without close relationships with the founders. The funding may be equity- or debt-based, and is sometimes a mix of the two. Figure 2.1 provides a schematic overview of the common sources of funding available to startup firms that will be covered in this study.

In the following two sections, short descriptions of available funding sources will be provided. Findings from previous studies focusing on the capital structures of young and small companies will also be discussed. Finally, the types of funding sources not included in this study will be identified and discussed. First, a brief elaboration on variations in the empirical studies will be offered.

**FIGURE 2.1.** Major funding sources for startup firms



### *2.2.1 Age, size and other differences*

In the entrepreneurship literature related to capital structures, funding sources for small firms, young firms, and combinations of the two are examined. In a number of these studies, there is not a clear distinction between firm size and firm age, and often, size tends to be used as a proxy for age. This can be problematic because while most young firms are small, the reverse is not necessarily true since many small firms remain small even as they mature and become more established. As such, hypotheses developed to apply to small firms can sometimes turn out to be equally or more applicable to startup firms. For example, hypotheses pertaining to why small firms

might be more sensitive to debt funding may be more readily applicable to young firms (Fort et al., 2013).

An adjacent example in the entrepreneurship literature is the area of research investigating the creation of new jobs. Though recent studies have confirmed the conventional wisdom holding that small firms have higher net growth rates than larger firms, the relationship disappears when firm age is controlled for (Haltiwanger et al., 2013; Lawless, 2014). In other words, it is not firm size *per se* that is driving these results, but rather firm age, insofar as net job creation is largely driven by young firms.

The scope for this study is limited to young firms; in other words, it is company age rather than company size that constitutes this study's focus. In the following sections, studies investigating capital structures that have been drawn from the entrepreneurship literature will be cited and discussed. Some of these studies have investigated funding for young firms, while others have addressed the funding of small firms. There are also other differences among these studies in terms of firm types; for example, some focus on specific industries or on firms with particular characteristics, in specific geographies, and with certain types of funding. The differences are important to keep in mind when making comparisons between studies.

### 2.2.2 Insider funding

#### Founders

Founder funding is defined as capital, in the form of debt or equity, invested in a firm by one or more founder who actually established the venture.

In existing studies about startups' funding portfolios, capital arriving from the founders is often identified as the largest source of financing for startup firms. For example, the GEM study shows that more than 60 percent of the capital going to new ventures stems from the founders (GEM, 2004). Similarly, Berger and Udell (1998) found that the principal owner accounted for around half of the capital utilized in new U.S. ventures. In a study focusing on a group of Belgian technology-based startups, Bozkaya and Van Pottelsberghe De La Potterie (2008) found that owner funding was used to finance more than 80 percent of the firms. Owner funding has been found to be primarily in the form of equity, whereby the owner invests personal savings into the firm (Robb and Robinson, 2010). To a lesser extent, owner debt is used to finance startups, and then mostly in the form of debt carried on the owner's personal line of credit (*ibid.*).

#### Family and friends

In the literature, informal investments from family and friends are often identified as being crucial to startup firms, sometimes referred to as "*the lifeblood of entrepreneurial ventures*" (Bygrave and Hunt, 2008, p. 2). Such funding may be debt- or equity-based. Particularly in studies about the U.S., funding from family and friends

is characterized as significant, representing the second- or third-largest source of funding in some studies (Bygrave et al., 2003; Campbell and De Nardi, 2009; Bates and Robb, 2013). Results from the European market are more mixed; some studies confirm the view that family and friends are frequent providers of funding to young firms, as exemplified by a U.K.-based study (Ullah et al., 2010), while others show that funding from family and friends is more limited, as highlighted in a study about the situation in Belgium (Bozkaya and Van Pottelsberghe De La Potterie, 2008).

### 2.2.3 Outsider funding

#### **Grants and public debt**

Governments intervene in the market in various ways to facilitate the supply of financing to startup firms. The economic-theoretic justification for public intervention addresses the need to correct for two types of market failures: information spillover effects and information asymmetries. The first type refers to situations in which firm knowledge can be copied by competitors, thereby preventing firms from fully capturing the benefits of their investments (Nelson, 1959). The second type occurs when the innovating firm has better information about the nature and potential of a project than do potential investors, and therefore the quality or riskiness of a project cannot fully be understood by the latter group (Stiglitz and Weiss, 1981). Both types of market failures are claimed to result in the undercapitalization of innovative projects or firms. Thus, in order to compensate for such underinvestment, most industrial countries spend significant amounts of effort and funds on programs and activities seeking to promote innovation. However, governments need to perform a balancing act when correcting for these types of market failures in order to avoid situations where public funds introduce inefficiencies or function as substitutes for investments that would have taken place anyway (Georghiou, 2002).

Governmental financial assistance can be indirect in the form of preferential tax breaks, patent laws, credit ceilings, loan guarantee schemes, and other benefits (Mason and Harrison, 2003; Revest and Sapio, 2012). Alternatively, it may be direct, such as when public funds are sourced directly into firms, in the forms of grants, public debt or public equity. In this report, we are particularly concerned with the micro perspective and thus focus on direct funding activities.

Grants are funds that usually do not have to be paid back, but which must be used for predefined purposes. They have been defined as *“a gift that has the aim of either ‘stimulating’ or ‘supporting’ some sort of service or activity by the recipient”* (Beam and Conlan, 2002, p. 341). While governments are major providers of grants, other players, such as private foundations and corporations, also provide grants.

Public debt, also known as soft loans, is another vehicle via which the government, local authorities, or other groups within the community can offer funding to encourage new businesses. Two large players in Sweden offering soft loans are ALMI and Norrlandsfonden. In comparison with conventional bank loans, soft loans have



lenient terms such as lower security demands and extended amortization schedules, and they may be written off, partially or completely, in the case of venture failure (Isaksson, 2006). Soft loans may offer lower interest rates than commercial debt, but in some cases, the interest rates could be higher in order to compensate for the high risk, as well as to help avoid crowding out private investments (cf. González and Pazó, 2008) .

Most studies evaluating young firms' capital structures do not specify the level of funding available from government sources. Those that do are primarily focused on the U.S. and often combine all types of government funding to startups, including grants and debt financing, into a single category. The overall impression is that governmental funding represents only a fraction of the total amount of capital available to startup firms. For example, according to Berger and Udell (1998) less than 0.5 percent of the capital available to young ventures comes from government agencies. Similarly, Robb and Robinson (2010) found that about one percent of young firms' funding comes from public sources. In one of the few studies focusing on non-U.S.-based startup firms, Hogan and Hutson (2005) found that among a group of Irish software firms, significantly larger shares of the companies' funding came from government sources, amounting to seven percent of the total capital.

### **Commercial debt**

One key source of capital to firms, including startups, is commercial banks or other financial institutions offering long-term loans as well as short-dated credits. Collateral, that is all the assets a business can pledge as a guarantee for a loan, is an important determinant of access to debt capital from commercial sources. Moreover, many banks tend to include restrictive covenants in the debt contract to reduce adverse selection and moral hazard problems (Berger and Udell, 1998). Accordingly, conventional wisdom holds that commercial banking products are unlikely to be readily available to startups, especially innovative firms, until they have achieved a measure of success and generated assets that can be used as collateral (*ibid.*). Furthermore, payments of interest and the amortization of loans may be difficult for liquidity constrained startups, and as such conventional debt is often regarded as a less optimal funding source for young businesses.

Nevertheless, several studies show that commercial banks constitute a rather common form of external financing to startup firms. For example, Berger and Udell (1998) found that commercial debt account for around 30 percent of external financing to young U.S. firms. Robb and Robinson (2010) found that more than 40 percent of U.S. startup firms are funded by bank loans and lines of credit. It is particularly interesting to note that also for young firms classified as being high growth and/or technology-based, outside debt is put forward as a significant source of capital in case of limited risk profiles (Vanacker and Manigart, 2010; Minola and Giorgino, 2011). In the Swedish market, it has been found that bank lending is one of the more common ways to finance small companies (Cressy and Olofsson, 1997; Winborg and

Landström, 2001; Klagge and Martin, 2005). How the access to commercial debt looks like for young Swedish companies is more unclear.

The fact that such a large proportion of the funding going to startup firms arrives from external debt from commercial institutions may seem to contradict conventional wisdom. Several factors have been proposed to explain the high level of debt-based funding to startups. From the perspective of the entrepreneur, bank financing is generally considered a low-cost and attractive funding source that, unlike equity, does not impact firm ownership or control of the business. But it is not only the case that entrepreneurs appreciate debt funding – it appears that banks also have an increasing interest in serving young firms. This is due to several factors. First, business loans to startups typically need to be guaranteed by one or more of the owners, that is, the personal assets of the entrepreneurs are used as collateral to back the loan (Berger and Udell, 1998). Hence, loans to startups are also guaranteed, although by the owners and not by the firm itself. Second, providing loans is now just one part of a larger suite of services that most banks offer. Financial institutions have developed a wide range of fee-based non-lending products and financial services for startup firms (de la Torre et al., 2010). As such, cross-selling is a way for banks to maximize their income streams in their dealings with startup firms. Third, banks are likely interested in building long-term relationships that may pay off in the future; for example, a bank may aim to become the principal financial services provider for the firm as it grows (Hellmann et al., 2004; Huyghebaert and Van de Gucht, 2007).

In addition to reducing exposure through guarantees provided by the firm owners, banks use other methods to decrease risk. Huyghebaert and Van de Gucht (2007) note that in cases where the risk of a potential loss is particularly high, banks often opt to finance a smaller proportion of the total amount of financing being sought, or to shorten the duration of the loan, rather than denying the loan request outright. In this manner, the bank can establish potential long-term relationships while minimizing its risk exposure. Furthermore, recent studies show that advances in technology that have reduced banks' transaction costs in their dealings with young businesses, together with increasing global competition among financial institutions, have served to improve access to external debt financing for startups (de la Torre et al., 2010; Korosteleva and Mickiewicz, 2011).

### **Business angels**

Business angels, or informal venture capitalists, are seen as playing an important role in the financing of firms in their early phases of development. A business angel may be defined as (Mason and Harrison, 2008, p. 309):

*“A high net worth individual, acting alone or in a formal or informal syndicate, who invests his or her own money directly in an unquoted business in which there is no family connection and who, after making the investment, generally takes an active involvement in the business, for example, as an advisor or member of the board of directors.”*

In other words, business angels invest their own funds directly into a small number of companies while taking on active roles in the businesses. Unlike venture capital firms that have fiduciary responsibility to other investors, angels tend to use various financial instruments ranging from pure debt to pure equity (Shane, 2012). Many business angels are active or former entrepreneurs or high-ranking managers (*ibid.*). While most business angels work alone, they do sometimes cooperate with others in small investment groups, such as business angel networks.

A description of the traditional business angel's investing pattern is as follows. Angel financing is often, but not always, made in early-stage companies (Wong et al., 2009). On average, firms are about 10 months old when they receive angel funding and have rarely realized any profit at that point. Business angels usually invest in companies within close geographic proximity. Furthermore, the investment sizes are rather small: in the U.S., the average angel investment is less than one mUSD on average (*ibid.*); in Sweden, the average angel investment is only 13.5 tEUR on average (Avdeitchikova, 2008). Business angels tend to undertake investments that formal venture capitalists would likely find unattractive due to the high levels of uncertainty associated with small, early-stage companies. One possible reason for this is that the informal investors commit a smaller portion of their wealth to direct investments into unquoted companies. Mason and Harrison (1994) found that U.K. business angels allocate five percent to 10 percent of their investments into small private firms. Similarly, it has been found that Swedish business angels put aside 11 percent for this type of investments (Månsson and Landström, 2006). It has also been suggested that private investors have lower transaction costs in comparison with formal VCs, allowing for investments in the earlier, and hence more risky, stages of company development (Avdeitchikova, 2008).

The primary motive for business angels to invest in unquoted companies is economically driven, and hence, just as with formal venture capitalists, angels seek to exit their investments primarily through sales of shares to a third party (Riding, 2008). However, given that business angels are not forced to make an exit within a certain timeframe, as opposed to formal venture capitalists typically operating closed-end funds with limited lifespans, the investment duration is usually less critical. In a similar vein, business angels tend to be more willing to accept a stream of dividends from a company that has found a valuable niche, rather than constantly seeking to achieve complete exits. Moreover, in the literature it is often asserted that business angels may have some non-economic motives for their investments, such as investing on 'moral' grounds (*ibid.*).

However, some changes seem to have taken place within the angel community. A new type of business angel has entered the market, one that is still scarcely researched but which has been the focus of intense discussion among practitioners and in the business press: the so-called 'super angel' (e.g., Spencer, 2009, May 21; Deloitte, 2013). The term refers to serial entrepreneurs and investors who are able to invest larger sums into startup firms, either directly or through fund structures, and who are perceived to be particularly sophisticated, skilled, and well-connected. Furthermore,

while traditional business angels tend to limit their investments to a smaller geographic area, super angels typically have a broader, even an international, reach when investing in promising early-stage companies. According to anecdotal evidence, this type of private investor is currently taking on an important role on the startup scene.

It is difficult to precisely quantify the size of the angel market for at least three reasons: (i) informal investors value privacy, and hence, there are no published or comprehensive listings of informal investments, making random sampling difficult; (ii) even when business angels are identified, it remains unclear whether the samples are representative for the full population; and (iii) angels are rare within the general population, making broad studies difficult (Riding, 2008). However, these difficulties notwithstanding, a few studies have managed to approximate the size of the business angel market. In the U.S., the business angel segment has been reported to be somewhat larger than the institutional VC market in terms of capital invested (Sohl, 2005), which is similar to findings from the U.K. (Mason and Harrison, 2000). Avdeitchikova et al. (2008) found that the size of the angel market in Sweden ranges between 385 and 450 mEUR per year, which is approximately one percent of the Swedish GDP, considered a rather moderate figure. According to Tillväxtanalys (2013), this amounts to 30 000 investments into private firms with between 3,000 and 5,000 active business angels in Sweden. This is somewhat less than, but still comparable to, the formal Swedish venture capital market. However, the number of firms receiving angel funding significantly surpasses those financed by formal VCs, because investment sizes are substantially smaller in angel deals compared to their VC counterparts. In previous studies about the level of startup funding that comes from business angels, figures ranging between four percent and 20 percent have been put forward (Berger and Udell, 1998; Bozkaya and Van Pottelsberghe De La Potterie, 2008; Robb and Robinson, 2010; Bhaired and Lucey, 2011).

An active private investment market is of importance to policymakers, and hence, ways to promote private investments on the agenda. One example is tax incentives for angel investors, where Sweden introduced a new investor deduction for private individuals in December 2013 after approval by the European Commission.

### **Venture capital**

Institutional or formal venture capital, hereafter referred to as venture capital or VC, is a type of financial investment targeting privately owned companies with large growth potential currently in their seed, startup or expansion phases. Given the focus on high-growth prospects and scalability, venture capitalists primarily invest in areas where technology and other innovations are being developed, i.e. in knowledge-based sectors, with a preference for applications with exceptional commercial potential. As such, venture capital tends to be concentrated in industries such as telecommunications, IT, life sciences, biotechnology, clean technology or internet-related services (Gompers and Lerner, 2001; Fraser-Sampson, 2007). A venture capitalist would typically seek minority ownership stakes in the firms in which she invests, leaving the majority ownership to the investee firm's management. Despite a

minority ownership, however, a venture capitalist will, through comprehensive contractual restrictions, possess decisive influence over strategically important decisions and thereby maintain close control of her investee firms (Kaplan and Strömberg, 2003; Cumming, 2008).

There are several types of VC firms, where most mainstream firms invest their capital through closed-end funds. Such funds are typically structured as limited partnerships in which the VC firm serves as the general partner (GP) and the investors serve as limited partners (LP). The LPs are mainly constituted of institutional investors and wealthy individuals who provide the bulk of the capital. VC firms may also be independent, owned by its management team and investing its own capital. Another type of VC organization comprises public companies that are listed on a stock exchange. VC firms may also be affiliates or subsidiaries of a bank, insurance company or industrial corporation, making investments on behalf of the parent firm or its clients; these are so-called corporate or captive VC firms. Other venture capital organizations include government-affiliated investment programs that aid startup companies via state or regional funding, functioning as government-funded VC firms.

Two major advantages of equity, i.e., VC and angel, investments have been advanced in the literature. First, venture capitalists, as well as business angels, are considered 'value-added' investors, who in addition to the supply of funding also contribute industry-specific knowledge and access to business networks. Second, equity funding does not increase the probability of company failure due to difficulties in paying interest and amortization or fulfilling covenants (Carpenter and Petersen, 2002). Having said that, the process of issuing new equity tends to be costly, particularly for small, young and unquoted companies, since these forms of funding require entrepreneurs to give away ownership stakes and some control of their ventures.

Only a few firms have the characteristics and high potential needed to attract VC investors, and, hence, venture capital is a relatively rare source of capital. A large number of studies support this contention. Robb and Robinson (2010) suggest that four percent of young U.S. ventures are VC backed, while Berger and Udell (1998) argue that only around two percent of U.S. startup firms are financed by venture capital. Ballou et al. (2008) showed that less than one percent of the approximately 600,000 new U.S. businesses with employees obtain venture capital financing. And the GEM study (2003), arrived at an even lower figure, finding that less than 0.5 percent of entrepreneurs launch their new ventures with formal venture capital. Based on data from the Swedish Agency for Economic and Regional Growth (Tillväxtverket) and the Swedish Private Equity and Venture Capital Association (SVCA), it can be roughly approximated that of the 46,000 firms founded yearly in Sweden between 2002 and 2012, less than one percent were financed by venture capital.

Although the share of firms that receive VC funding is very small, there are several strong arguments to be made in favor of the economic and societal benefits of this type of funding. For example, Kaplan and Lerner (2010) argue that while few firms receive venture capital, a large proportion of the startups that make it to an initial public offering (IPO) were funded with venture capital, showing that 60 percent of

the firms that were listed on the U.S. stock exchanges between 1999 and 2009 received VC funding. Furthermore, although the firms that receive VC funding are few in number, once an affirmative funding decision has been made, the amounts of capital disbursed tend to be substantial (Bozkaya and Van Pottelsberghe De La Potterie, 2008).

Others maintain, however, that even among firms with high-growth potential, venture capital is far from widespread. Kedrosky (2009) studied the prevalence of VC-financed firms among businesses on the Inc. 500 list of the fastest-growing private companies in the U.S. Only 16% of the 900 unique firms presented on this list from 1997 to 2007 were VC backed. In other words, even among the fastest-growing and most successful companies in the U.S., less than 20 percent are financed by venture capital.

#### **2.2.4 Other funding sources**

In addition to the funding options elaborated upon in the preceding sections, there are a few other routes entrepreneurs may choose when seeking capital. The more common of these are activities such as bootstrapping, crowdfunding, and capitalization through IPO. For various reasons, we have chosen not to include these options, or only to some extent, in the current study.

#### **Financial bootstrapping**

Financial bootstrapping is commonly defined as *“the use of methods for meeting the need for resources without relying on long-term external finance from debt holders and/or new owners”* (Winborg and Landström, 2001, p. 235). Bootstrapping strategies may be divided into two categories: those with the aim of reducing the need for financial capital, and those that seek to provide alternative sources of capital (Harrison et al., 2004). We are primarily interested in latter, which includes methods for acquiring financing without seeking debt or equity funding from traditional sources.

Financing from founders, as well as from family and friends, is often referred to as a type of bootstrapping activity. In some studies, various government schemes for funding startup firms may also be classified as bootstrapping activities. These two types of funding are included in the current study. Funding from other staff members, besides the founders, is also typically included in the category of financial bootstrapping. However, this funding source is not included in this study, as a paucity of relevant data exists pertaining to it.

Other bootstrapping activities are difficult to separate from firms’ daily operations, and thus we have decided to omit them from the current study as well. Specifically, we have chosen not to include the following four types of alternative sources of capital. First, company-retained earnings, which become an important funding source as firms grow (Berger and Udell, 1998; Vanacker and Manigart, 2010). Second, trade credits, which have been found to represent a fairly significant indirect funding source for small firms (Berger and Udell, 1998; Huyghebaert and Van de Gucht, 2007; Robb

and Robinson, 2010). Third, leasing and factoring, used to finance business operations by freeing up cash that otherwise would be invested in fixed assets (Cosh et al., 2009). Fourth, various types of customer financing in the forms of advance payments, shorter payment periods, etc. (Winborg and Landström, 2001; Denis, 2004).

### **Crowdfunding**

A newer form of financing that has been made possible by recent technological advances is known as crowdfunding. The idea behind crowdfunding is to obtain capital from a large cross-section of the public, with each individual typically contributing very small amounts, rather than soliciting funding from a small group of sophisticated investors (Agrawal et al., 2010; Belleflamme et al., 2011). This type of fundraising is generally conducted via internet-based social networks. Given that crowdfunding is still a rather limited phenomenon in Sweden, we have elected to omit it from the present study.

### **IPO**

An initial public offering occurs when a company makes its shares available to the public through listing on a securities exchange for the first time. The provision of market-based support for European SMEs became immensely popular in the late 1990s when many major stock markets developed secondary exchanges in the hope of emulating the Nasdaq's success. Such markets generally have less stringent listing requirements than do the primary exchanges, and hence are considered to be better suited to the purposes of smaller firms. In Europe, a wave of Nasdaq exchange copies emerged with the expectation that these trading platforms would secure the long-term funding for many high-growth, mainly technology-based, startup ventures (Bottazzi and Da Rin, 2005; Carpentier et al., 2010; Revest and Sapio, 2012).

However, the history of the new markets in Europe is rife with notable failures, with only a few exceptions, including the U.K. AIM stock exchange (Revest and Sapio, 2012). None of the European markets even came close to matching the size of the Nasdaq, and most of them collapsed in the wake of the dot-com crash. Since 2000, the number new firms entering into the public stock markets has been low, particularly among young companies (Kedrosky, 2009). Two major explanations for the seeming inability to create well-functioning public stock markets for small and relatively young companies have been proposed (Revest and Sapio, 2012). First, liquidity is often discouraged by poor diversification opportunities due to the high proportions of risky R&D companies. Second, the European market is not considered to be large enough for the number of stock exchanges that were operational around the year 2000, and hence the competition became too intense (*ibid.*). While some recovery has occurred recently in the U.S. market (McDuling, 2013), the number of young firms that have made it to an IPO in Europe, including Sweden, is still very low (EVCA, 2013; Dagens Industri, 2014). As such, we have also opted to omit funding from IPOs from the present study.

## 2.3 Determinants of capital structures

An area that has attained a great deal of interest from financial scholars concerns the factors that determine capital structures in companies. The two most common approaches used to explain the structure of young firms' funding portfolios are based on the pecking order and life cycle theories.

### *2.3.1 Theoretical perspectives*

One of the more influential ideas in the finance literature is the pecking order theory of capital structure choice, which posits the emergence of a hierarchical order based on the presence of information asymmetries between companies and their potential financiers (Myers and Majluf, 1984). According to this framework, informational asymmetry arises when managers have more complete information about an investment opportunity than do the investors who are being asked for funding. Such asymmetries may become serious issues and result in adverse selection problems (Akerlof, 1970) or in moral hazard (de Meza and Webb, 1987). The former reduces the accuracy with which the investor can assess the quality of a company, while the latter refers to the situation that exists when managers misuse issued funds for personal gain. As a result, investors may demand a premium in exchange for capital due to this informational opacity – and the more risky the investment, the higher the premium will be, since risk intensifies the effects of information asymmetry (Myers, 1984). Consequently, external finance is costly, and as a result, managers prefer to finance new investments with internal funding whenever possible. Only when internal funds are insufficient to meet a firm's financing needs will managers turn to more expensive outside funds. Of the external sources, the theory stipulates that debt financing is preferred to equity, since the former will be less exposed to information asymmetries and hence is subject to lower premiums (Myers, 1984; Myers and Majluf, 1984). This hierarchy is referred to as a financial pecking order.

While the pecking order theory was originally developed to explain financial strategies of large and mature companies, scholars have investigated whether the theory is also applicable to young and small ventures. Given that such firms have a set of characteristics that distinguish them from large corporations, it is not immediately obvious that these ideas are fully applicable to the small firm (Cassar, 2004). Compared to larger, especially listed, companies, startup firms have: (i) limited histories and thereby no track records, (ii) no reputation at stake, (iii) limited tangible assets and thereby limited ability to offer guarantees, (iv) inherent uncertainty due to the innovation process, (v) less stringent rules regarding information disclosure, (vi) ownership that is often concentrated in the hand of the founders, and, (vii) significantly higher failure rates (Audretsch and Stephan, 1996; Berger and Udell, 1998; Cassar, 2004; Cressy, 2006; Huyghebaert and Van de Gucht, 2007). Taken together, startup firms are arguably the most informationally opaque type of businesses in the economy and, therefore, face

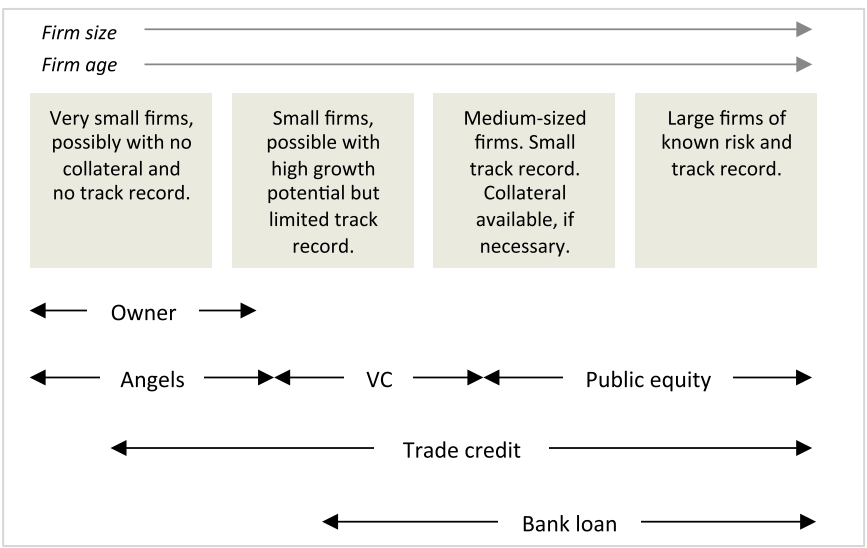


extraordinarily severe information asymmetry problems (Berger and Udell, 1998; Cassar, 2004). Given this fact, in addition to the small scale of entrepreneurial projects, the widespread belief is that investing in young and small companies is expensive. Therefore, the premium for external funding is expected to be high for startup firms.

Consequently, several scholars acknowledge that the traditional pecking order hierarchy also applies well to startup firms. Just as larger companies, small and emerging firms prefer to finance new projects with internal means, and thereafter, if necessary, to seek external debt capital, only seeking expensive external equity as a last resort, given the high costs associated with giving up ownership stakes (Berger and Udell, 1998; Huyghebaert and Van de Gucht, 2007; Vanacker and Manigart, 2010). Hence, the use of external equity funding could be a signal of low firm quality since this is a last resort for most firms. Other scholars, however, maintain that the traditional pecking order is reversed for entrepreneurial firms for two reasons. First, the rank order is likely to be distorted if the investors have superior knowledge about the commercialization prospects of an entrepreneur's innovation. For example, Garmaise (2001) shows that when investors are known to possess a greater ability to assess project quality relative to that of the entrepreneurial team, external equity finance will instead be indicative of a high-quality firm. Second, external equity may also be ranked higher if investors are able to add not only capital but also non-monetary value to their investee firms (Garmaise, 2001; Carpenter and Petersen, 2002).

Another theoretical model used to investigate the determinants of company capital structures is the life cycle paradigm, which examines how the use of funding changes over time (Berger and Udell, 1998). The basic idea is that financial needs and access to funding change as the venture grows, gains more experience and becomes less informationally opaque. According to Berger and Udell (*ibid.*), smaller and younger firms have to rely more on insider financing, trade credits and angel funding. As they grow, equity finance will also be available from venture capitalists, as will debt capital from banks and other financial institutions. Eventually, if the firm continues to grow, it may gain access to public equity through an IPO. Figure 2.2 presents Berger and Udell's (*ibid.*) illustration of the financial growth cycle for small businesses in a somewhat simplified format. This model of how firms are financed has gained significant popularity in business schools and among practitioners. The life cycle approach, however, does not fit all types of small ventures, such as cases where some of the financing alternatives are only available to a small subset of firms, i.e., business angel funding, venture capital and public equity. This is an observation that was also highlighted by Berger and Udell (*ibid.*), and will be further discussed in subsequent sections.

**FIGURE 2.2.** The financial growth cycle of firms according to Berger and Udell (1998, p. 623), somewhat simplified.



In addition to determinants of capital structures arising from the pecking order and the life cycle theories, other factors related to the characteristics of the founders, firms, and institutions have been highlighted in the literature.

*2.3.2 Other factors affecting capital structures*

**Entrepreneur’s attitudes and traits**

The entrepreneur’s attitude towards financing, not surprisingly, plays an important role in shaping how the company’s capital structure will be formed. The entrepreneur’s willingness to share control of the business when obtaining external financing is of central importance. Retaining control and full decision-making control also increases the prestige and status that comes with ownership (e.g., Huyghebaert and Van de Gucht, 2007). Consequently, some entrepreneurs who have the capability to choose, i.e., whose ventures are profitable enough to reinvest proceeds or who have sufficient levels of their own capital, tend to avoid external financing (Vanacker and Manigart, 2010). Furthermore, in line with the pecking order hierarchy, such entrepreneurs are likely to prefer external debt if outside funding is needed, since such funding avoids the dilution of ownership and loss of control (Berger and Udell, 1998). Other entrepreneurs, however, may seek to share risk with less risk-averse investors such as business angels and venture capitalists, appreciating the non-monetary values that such investors bring to the table (ibid.).

To what extent, and how, owner-specific traits affect company capital structures has been investigated by a number of scholars – with rather contradictory results. For example, Robb and Robinson (2010) found significant support suggesting that entrepreneurs with prior startup experience tend to rely more on external equity than others, while entrepreneurs with more industry experience avoid outside funding to a greater extent. Sanyal and Mann (2010), on the other hand, propose that serial entrepreneurs have greater freedom to finance their businesses using their own resources, bank loans or external equity, since more information is available about these entrepreneurs. Furthermore, the authors (*ibid.*) maintain that educated entrepreneurs prefer debt financing, while Colombo and Grilli (2007) suggest that the propensity to use internal capital as opposed to external sources is positively correlated with education in economics. Others argue, though, that owner-specific traits do not have any strong influence on the capital structures of startup firms. For example, Cassar (2004) showed that after taking firm-specific characteristics into consideration, none of the factors studied, including education level, experience or gender, had any impact on financing preferences. Finally, existing networks and relationships have also been shown to impact how an entrepreneur chooses to fund her business (Atherton, 2009).

### **Venture's age and size**

According to the financial life cycle theory discussed above, young and small firms are expected to first and foremost rely on capital arising from internal sources, and, to some extent, from business angels. Thereafter, most firms eventually move over to external equity in the form of venture capital and external debt from banks or other commercial institutions, and following that, potentially to capitalization from IPOs (Berger and Udell, 1998). However, this simplified manner of describing firms' financial needs in various stages turns out not to be fully accurate, at least not in the current financial market. For example, as addressed above, recent research shows that very young firms rely on bank debt to a surprisingly high degree (Bozkaya and Van Pottelsberghe De La Potterie, 2008; Robb and Robinson, 2010). Moreover, although formal venture capitalists used to primarily target young, pre-revenue businesses, after the burst of the dot-com bubble, they moved to firms in later, less risky stages of their development (Kedrosky, 2009; Greene et al., 2010). While some U.S. venture capitalists seem to once again be willing to invest in seed-phase firms, such activities have not yet been seen in the Swedish market to any large extent (McDuling, 2013; Dagens Industri, 2014).

The size of the firm also effect the type of financing sources that are available. The theoretical explanation of why size affects company capital structures relates to factors such as economies of scale in lowering information asymmetries, scale in transaction costs, market access, and risk exposure (Cassar, 2004). As a result, smaller firms are expected to be offered less capital, or to receive capital at higher costs, in comparison with larger firms. In line with this, empirical research shows that larger startup firms, in terms of revenues and employees, have a greater proportion of debt

and lower shares of insider funding compared with 'smaller' small businesses (Berger and Udell, 1998; Cassar, 2004).

### **Venture's financial status and asset structure**

In accordance with the pecking order theory, profitable firms are expected to prefer to finance investments internally, and thereafter to seek external debt financing. However, companies generating negative cash flows or with excessive leverage are more likely to issue external equity, since additional debts are difficult to obtain (Vanacker and Manigart, 2010).

A firm's asset structure is also expected to affect its financing options. The more tangible and generic the company's assets are, the greater its liquidation value in case of default (Cassar, 2004). Moreover, tangible assets are considered to reduce adverse selection and moral hazard. Hence, startup firms with more tangible assets are more likely to use external debt in their financing portfolios (Cosh et al., 2009; Sanyal and Mann, 2010). On the other hand, firms with strong intangible and intellectual properties, e.g., patents, trademarks, and human capital, are found to more often seek and receive external equity (Cosh et al., 2009; Robb and Robinson, 2010; Vanacker and Manigart, 2010). However, given the limited availability of external equity, these firms are in general more financially constrained than others (Cosh et al., 2009). For example, Revest and Sapio (2012) show that small firms with higher R&D intensity, more patents, fewer tangible assets and larger proportions of qualified employees, in general report more problems in accessing external finance.

Another factor highlighted in the literature as a determinant of capital structures concerns the amount of funding required. The larger the project and the more capital needed, the higher the probability that the venture will turn to formal venture capitalists for funding (Schäfer et al., 2004; Ueda, 2004).

### **Industry and level of risk**

The type of industry and the level of risk associated with the investment are also factors that are found to significantly influence firms' capital structures, although not always as expected.

It is evident that young businesses in high-growth sectors often receive more external equity-based funding than firms operating in more traditional industries (Berger and Udell, 1998; Carpenter and Petersen, 2002; Robb and Robinson, 2010). Furthermore, venture capitalists, in line with their business model, to a large extent focus on relatively young high-technology industries such as telecom, IT, biotechnology, life science, and clean tech. In other words, venture capitalists, at least traditionally, are more likely to fund entrepreneurial firms with innovative products or processes with large scalability and growth potential, rather than imitator firms (Hellmann and Puri, 2000). There are also strong arguments suggesting that equity investors, particularly VCs, would be in a better position to invest in high-risk ventures compared with external debt providers. The argument here is that venture capitalists have an advantage over banks in mitigating adverse selection and moral

hazard problems since they have access to more comprehensive information about potential portfolio firms and their founders (Nofsinger and Wang, 2011).

Furthermore, as discussed previously, equity financing is considered to have some advantages over debt for young, fast-growing firms, including the lack of requirement of loan securities in the form of collateral, the lack of cash-flow constraints due to interest and amortization payments, and greater non-financial added value provided by the investors (Carpenter and Petersen, 2002). However, the conventional wisdom that small high-tech firms are not likely to attract finance from banks is found to be wrong, as stated repeatedly in this report. Instead, a number of studies demonstrate that banks constitute a significant source of external financing for high-technology firms. In a similar vein, while some studies tend to equate high-risk ventures with external equity (e.g., Berger and Udell, 1998), other studies do not find that that risk has any predictive power when it comes to assessing the likelihood of a particular company to seek out debt or equity (e.g., Schäfer et al., 2004).

With regards to startup firms in traditional industries, or to imitator firms, capital tends to come first from internal funding and thereafter from bank loans and trade credits (Berger and Udell, 1998; Huyghebaert and Van de Gucht, 2007; Mitter and Kraus, 2011).

### **Country-specific economic and institutional variables**

A few studies have investigated whether capital structures in small firms are impacted by country-specific economic and institutional variables. The key question is whether firms' capital structures primarily depend on founder- and firm-related factors rather than being a result of the institutional environment in which they operate (Hall et al., 2004; Psillaki and Daskalakis, 2009). The findings on this question seem to be mixed. For example, Psillaki and Daskalakis (2009) argue that micro factors are more important than macro factors when it comes to explaining small firms' funding sources, while Jøeveer (2013) puts forward the notion that country factors better explain differences in capital structures in small firms, at least when studying variations in leverage.

## **2.4 Contracts and valuation**

In this study, we also investigated a few questions concerning how investors exercise control through contract formulation and valuation procedures.

Agency theory suggests that the entrepreneur (the agent) has more and better information compared to the investor (the principal). Hence, the principal seeks ways to mitigate any risks involved (Jensen and Meckling, 1976). A number of studies have investigated how venture capitalists use contracts to exert control over their portfolio companies (e.g., Kaplan and Strömberg, 2003; Cumming, 2008). Van Osnabrugge (2000) argues that business angels and venture capitalists differ in their approaches to mitigate risks. He suggests that venture capitalists seek to decrease asymmetries

of information primarily through extensive investment screening and due diligence of the potential investee firm, followed by the strategy of constructing optimal contracts. In other words, VCs exert their control via an *ex ante* approach. Business angels, on the other hand, mitigate uncertainties primarily through *ex post* control, which is sometimes referred to as an incomplete contract approach. Supporting this view, Wong et al. (2009) find empirical support for the notion that venture capitalists and business angels differ in their methods of overseeing investee firms. While venture capitalists primarily use the provisions of shareholders' agreements, such as board rights, staging of investment, and contractual terms, to control their investee firms, business angels exercise control via post-investment activities and assistance.

In addition to terms and conditions in the shareholders' agreement, the valuation of the firm is usually a central part of the negotiations between investors and entrepreneurs. Entrepreneurs are believed to strive to obtain as high a valuation as possible, that is, by minimizing the amount of equity they give away, while investors seek a lower valuation, enabling them to obtain more equity for their money.

## 2.5 Summary

This chapter has discussed the theoretical foundations used to define innovative startup firms. In addition, a literature review of common sources of funding for startup firms has been presented. Funding sources were categorized into two major groups: insider funding, which comes from founders, family and friends; and outsider funding, which comprises grants, public debts, loans from commercial institutions, business angel financing, and venture capital. Financial bootstrapping, crowdfunding and IPOs were also briefly discussed.

Factors that have been found to influence capital structures in startup firms were discussed. Financial pecking order theory holds that firms prefer to finance their businesses with internal funding first, and only then, if necessary, to seek external debt funding; external equity capital is sought only as a last resort. This theory finds relatively broad support when applied to young businesses. For a few high-risk and high-growth firms, a reversed pecking-order hierarchy, where external equity is preferred before external debt, may be more applicable. Furthermore, the review indicates mixed results about the extent to which owner characteristics and traits impact capital structures. Moreover, the impression derived from the review is that larger 'small' firms, firms with more tangible assets, and startups in traditional industries, tend to rely heavily on debt in case external funding sources are used. Other companies, including those that are financially constrained and those having primarily intangible assets, as well as high-growth businesses, are funded primarily by external debt, but are more likely than other firms to utilize funding from external equity sources, that is, from business angels and venture capitalists. Furthermore, a few studies have investigated the extent to which institutional factors, such as country-specific differences, impact capital sources of young firms; the results of

these studies have been mixed. Finally, theories accounting for the ways that venture capitalists and business angels exert control over investee businesses were discussed. In the following two chapters, the current study will be presented, starting with a discussion of the methodology used.

# Methodology

## 3.1 Operationalization of innovative startup firms

As discussed in Section 2.1, we apply a qualitative measure for the operationalization of innovative startup firms. That is, instead of classifying a firm as being innovative based on some technical criteria such as belonging to a specific type of industry or having filed a certain number of patents, we define innovations in relation to the actors' perceptions and knowledge. The perceptions and knowledge are based on the judgments made by two parties – the entrepreneur and the financier. For this study, we looked for financiers providing funding solely to young firms that they consider to be innovative and to possess growth ambitions. One program that only accepts applications from companies fulfilling these requirements is the Swedish governmental grant program VINN NU, whose applicant pool constitutes our sample group (cf. Bruton and Rubanik, 2002).

## 3.2 The sample

The major objective for this study was to outline the financial sources used by Swedish innovative startup firms with growth ambitions. In order to identify such firms, we turned to the Swedish Governmental Agency for Innovation Systems (VINNOVA), which has a special program, VINN NU ('Win Now'), developed for innovative startup firms. The program targets new ventures that are less than one year old with a business idea based on new technology, new knowledge or new ways of application, and with a clear goal to expand. VINN NU was established in 2002 and awards 300,000 kSEK (approximately 40,000 kUSD) in the form of grants to up to 24 companies annually. The companies that have applied for a VINN NU grant between 2002 and 2012, and either received or 'almost' received the grant, constitute our study group. A firm that 'almost' received the grant was considered to fulfill all set criteria after a first screening and after being reviewed by external experts, but was rejected in the final decision-making round. Hence, our sample consists of startup firms considered to be



innovative with growth potential by the entrepreneurs themselves, as well as by the grant providers.

As shown in Table 3.1, the number of VINN NU applications that were either accepted or close to accepted amounted to 483 between 2002 and 2012. We were able to identify 400 e-mail addresses that we used as a starting point for a web-based survey. An email was sent out in October 2013 with an introduction from VINNOVA and the dean of the Stockholm School of Economics. We sent out two email reminders in November and also telephoned those who had not responded. Responses were collected until the end of November 2013. A total of 138 companies answered the survey, equating to a response rate of 34.5%. We removed 25 cases due to missing internal data. Our final sample consists of 113 cases with fully completed forms.

In the period 2002 to 2012, nearly 600,000 new companies were founded in Sweden (SCB, 2014). Our assumptions in Section 2.1 included the estimate that between one percent and 12 percent of the startup firms in Sweden could be considered innovative with growth ambitions. Based on our assumptions, between 6,000 and 72,000 of the total number of new firms throughout the period 2002-2012 would then be classified as being innovative, growth-oriented companies. Accordingly, our sample of 113 firms represents between 0.2 percent and 1.9 percent of all Swedish innovative startup firms with growth ambitions founded between 2002 and 2012.

Table 3.1. Overview of the sample: Number of firms included in the study.

START YEAR	VINN NU applications*	SAMPLE per year	PHASE	AGE	SAMPLE	PERCENT of total sample
2002	37	3	Expansion	5-10 years	34	30%
2003	46	3				
2004	50	6				
2005	38	5				
2006	40	5				
2007	42	12				
2008	39	8	Early development	2-4 years	41	36%
2009	34	12				
2010	38	21				
2011	40	24	Startup	1 year	24	21%
2012	79	14	Seed	< 1 year	14	12%
TOTAL	483	113			113	100%

\* VINN NU applications that either were approved or almost approved, where duplications has been removed. In total 1,309 applications were received from 2002 to 2012.

The response rate was higher among younger startup firms compared to older. Of the firms founded between 2002 and 2009, three to 12 responses were retrieved for each year. However, for the firms set up after 2010, the response rates were significantly higher.

Similar to other studies in the field, we split the responses into four groups reflecting each venture's age when analyzing the data. Following existing research (Bottazzi and Da Rin, 2002; Mayer, 2002; Bozkaya and Van Pottelsberghe De La Potterie, 2008), this classification is based on the following distinctions. *Seed* refers to the first phase when a concept still needs to be proven and developed, referring to firms that are less than one year old. The second phase, *startup*, is when products are developed and the first sales and marketing activities are initialized. Firms in this category are one year old. In the third phase, *early development*, the firm is expanding and sales take off, but often the venture is still unprofitable. The firms in this group are between two and four years old. Finally, *expansion* is the phase starting from year five and then, for the current sample, continuing to year 12.

In our sample, the 113 respondents represent the 113 participating firms. However, for each firm, we have asked the respondents to indicate what type and how much funding their firms received in the last two years (i.e., 2011 and 2012). When analyzing the responses regarding funding used, we ended up with a total of 212 annual observations for the 113 firms, as shown in Table 3.2. Hence, within this study we have (i) 14 firms in their seed phase and 38 annual observations of funding used in a seed phase; (ii) 24 ventures in the startup phase with 45 observations; (iii) 41 firms in an early development phase with 73 observations; and (iv) 34 firms in their expansion phase with 56 annual observations of their funding sources. In total, the sample consists of 113 firms with 212 yearly funding observations.

**Table 3.2. Overview of sample: Number of funding observations included in the study.**

PHASE	AGE	Number of funding OBSERVATIONS	PERCENT of total obs
Seed	< 1 year	38	18%
Startup	1 year	45	21%
Early development	2-4 years	73	34%
Expansion	5-10 years	56	26%
<b>TOTAL</b>		<b>212</b>	<b>100%</b>

### 3.3 Variables

When testing factors that predict use of external capital, a process elaborated upon in Section 4.3, the following variables were used.

Our dependent variable *Total external capital* concerns the total amount of external funding used during the period 2011 to 2012 in SEK. The variable captures the total amount of external capital that was invested in the firm during these two years in the forms of grants, public debt, commercial debt, business angel funding and venture capital.

Five independent variables were used in the regressions. One independent variable is *Founder debt* and captures total debt investments during 2011 and 2012 from the founder(s). Another variable is *Founder equity*, captured through a summation of equity investments from the founder(s) during the same period. We also measured *Founding team*. This variable is the total size of the founding team at the time of the application for the VINN NU grant. The next variable is *Funding strategy*. In the survey, we asked respondents whether they had a funding strategy. The variable was coded 1 = 'yes, written', 2 = 'yes, but not written', and 3 = 'no, we do not have a financial plan'. We included a *Foundation year* variable to reflect our interest in whether there is a funding gap over time, i.e., whether company age affects external financing. This independent variable ranges from 2002 to 2012, i.e., higher values mean younger firms.

We included control variables pertaining to the industry to which each venture belongs. The five industry dummies were collected from open-ended questions in the VINN NU applications and then coded as following: (i) *IndustryA: Production, materials* representing 13.0 percent of the sample, (ii) *IndustryB: Software, telecom, electronics* representing 32.4 percent of the sample, (iii) *IndustryC: Biotech, medtech, health* representing 9.3 percent of the sample, (iv) *IndustryD: Energy* representing 13.9 of the sample, (v) *IndustryE: Services* representing 16.7 percent of the sample, and (vi) 'Other', as the hold-out category.

In initial regressions, we also incorporated other independent and/or control variables. The variables tested in the models were: (i) the total amount of capital that the founder had invested at the time of submitting the VINN NU application, (ii) the amount of external capital invested at the time of submitting the VINN NU application, (iii) the number of employees at the time of the submission of the VINN NU application, (iv) a dummy variable to control for IP protection strategy, coded 1 if the firm had or planned to apply for a patent at the time of the VINN NU application and 0 otherwise, and (v) a dummy variable to test the urban location of the firm. None of these variables were shown to significantly impact the level of externally attracted capital. Given the limited number of observations in our study, we decided to omit those variables from the final regressions in order to develop more robust models.

### 3.4 Analyses

Most of the results presented in Chapter 4 are based on descriptive data. In Section 4.3, regression results for determinants of external funding levels are presented. Appendix 2 presents descriptive statistics and correlations for the variables used in the regression. There are no or little correlations between our control variables and the dependent variable, and the same pattern is evident for the independent variables (according to VIF tests).

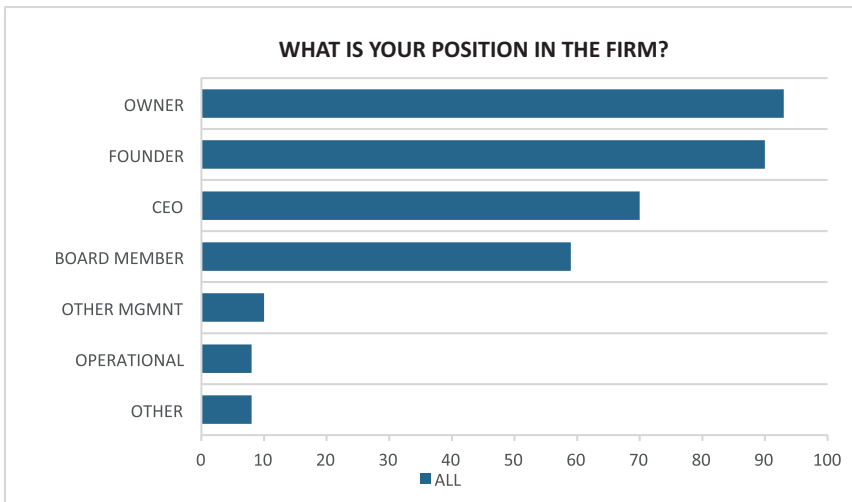
All variables with the exception of the binary were logged, primarily to mitigate the effects of heteroscedasticity and the influence of extreme observations, and standardized, to obtain a scale-free analysis. To estimate and conduct inference in our models, we relied on ordinary least square regressions (OLS) using SPSS, version 22.

# Results

## 4.1 Sample characteristics

A vast majority of the 113 respondents in this study are owners, founders, or chief executive officers (CEOs), as illustrated in Figure 4.1.

**FIGURE 4.1.** Respondents' positions. Percentage of respondents. N=113. More than one position could be entered.



These roles often occur in combination; more than 70 percent are both founders and owners, about 50 percent of the respondents simultaneously hold the positions of owners, founders and CEOs, and almost 40 percent are owners, founders, CEOs and

board members. The average number of positions simultaneously held is 2.66. A total of nine percent and seven percent hold other managerial or operational positions, respectively; seven percent belong to the 'other' group, including former founder, chairman of the board, and other similar roles.

The respondent group consists of 16 women (14.2%) and 97 men (85.8%). The respondents' age distribution shows that the average age of the respondents is 44 years (born 1969) and the median age is 43 (born 1970). The oldest respondent was born in 1939 and the youngest was born in 1989 (24 years old in 2013).

## 4.2 Funding sources

This section looks at the startup firms' use of various sources of financing, comparing the use of internal and external funds and elaborating upon how the use of funding sources changes over the course of firms' development.

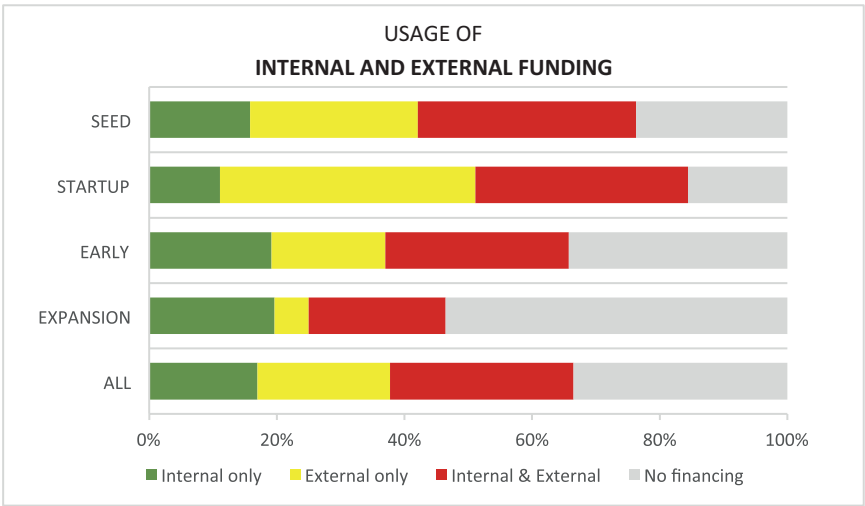
### 4.2.1 *Use of internal versus external funding*

In Figure 4.2 and Table 4.1, the funding pattern for the most recent year is presented, split into four groups. 'Internal only' represents the number of firms that have only used funding from their founders and families/friends in the forms of either equity capital or debt. The 'external only' group represents those firms that have only received funding from external parties in the forms of grants, public or commercial debt, business angel or venture capital funding. Next, the ventures included in the 'internal and external' group have received funding from both internal and external financiers. Finally, the number of firms in each development phase that have not used any funding at all during the most recent year is presented.

It is noteworthy that one-third of the firms did not make use of any outside funding during the most recent year. This was particularly pronounced in the expansion phase, during which more than 50 percent of the firms relied only on internally generated profits and other bootstrapping activities. In the early development phase, 34 percent of the firms were not funded. Since this sample consists of innovative firms with international expansion potential, these observations are rather surprising. Firms in the startup phase are the group of ventures that use funding to the highest extent, with 84 percent receiving funding.

Approximately 16 percent of the seed-phase companies reported having only internal funding, 26 percent had external funding only, and 34 percent had both internal and external funding. The innovative firms in the startup phase are the group of firms using the largest share of external only funding, representing 40 percent. Looking at ventures in their early development phase, the pattern is similar, although with a higher share of funding coming only from internal sources. The expansion group differs from the others, having a fairly high number of firms funded by financiers classified as internal, i.e., the founders or family/friends, while only five percent of the firms are financed solely by external parties.

**FIGURE 4.2.** Use of internal and external funding for all firms during the most recent year.  $N_{\text{Seed}} = 38$ ,  $N_{\text{Startup}} = 45$ ,  $N_{\text{Early}} = 73$ ,  $N_{\text{Expansion}} = 56$ ,  $N_{\text{All}} = 212$ .



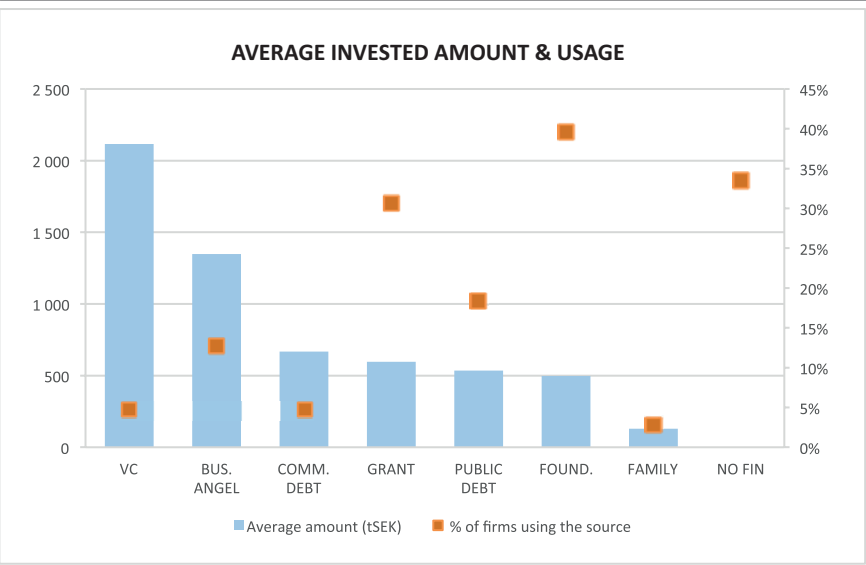
**Table 4.1.** Use of internal and external funding, number of firms.

PHASE	INTERNAL ONLY	EXTERNAL ONLY	INTERNAL & EXTERNAL	NO FINANCING	TOTAL
SEED	6 (16%)	10 (26%)	13 (34%)	9 (24%)	38
STARTUP	5 (11%)	18 (40%)	15 (33%)	7 (16%)	45
EARLY	14 (19%)	13 (18%)	21 (29%)	25 (34%)	73
EXPANSION	11 (20%)	3 (5%)	12 (21%)	30 (54%)	56
ALL	36 (17%)	44 (21%)	61 (29%)	71 (33%)	212

Figure 4.3 provides a first illustration of the extent to which various funding sources had been used during the most recent year. The orange dots illustrate the percentage of firms that have used a specific funding source. The most frequent source of funding was from founders; 40 percent of the firms reported having been financed by their founders in the most recent year. Grants, primarily from government institutions, ranked second, and public debt ranked third. The average invested amount in thousands of SEK is illustrated by the blue bars (zero values were omitted from the calculation). Although only five percent of the firms in our study were financed by venture capital during the most recent year, once VC had been granted, the amounts disbursed are, on average, significantly larger than those obtained from other funding sources. Business angel funding is the next-largest source of funding, followed by the ‘Other’ category (including funding from corporations). Debt from commercial

institutions ranked last. The following sections will elaborate upon the frequency and amount of each funding type in greater depth.

**FIGURE 4.3.** Invested amount and source use. Average amount only for firms using the specific source. Percentage of all sample firms using the specific source during the most recent year. N=212.



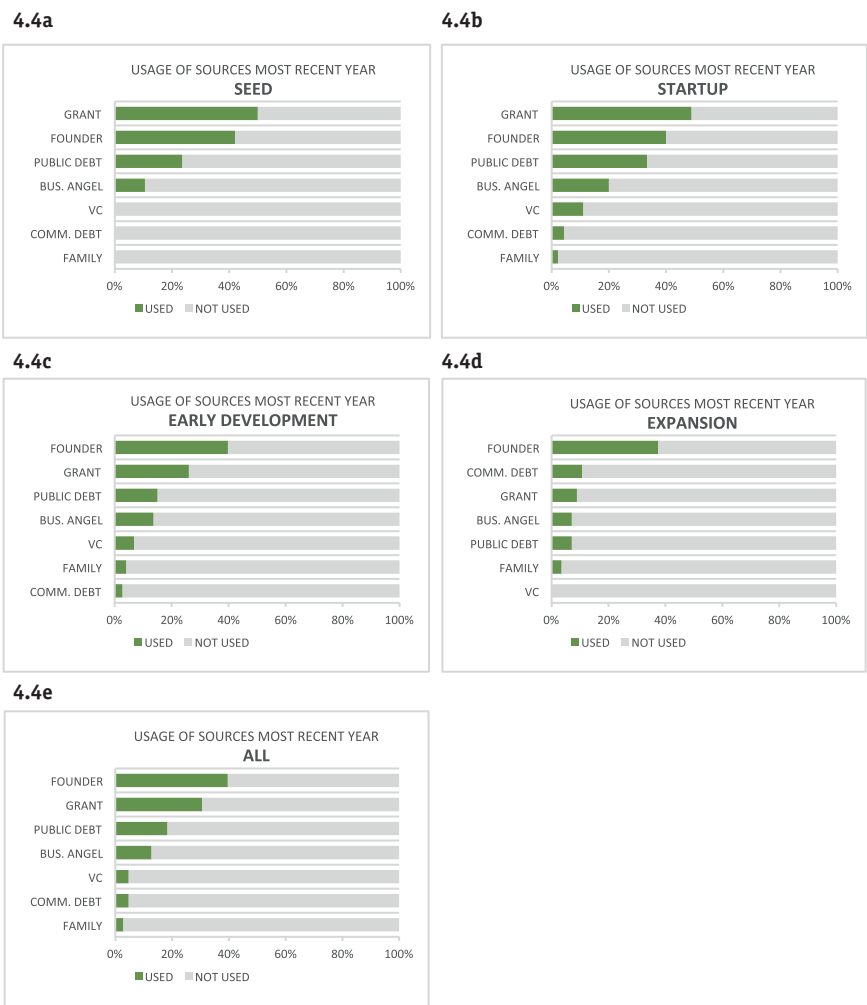
4.2.2 Funding sources across phases

Figures 4.4a to 4.4e below depict the sources of funding that have been used in each phase of development during the most recent year. The number of firms that have used a specific funding source is reported as percentages of all ventures in that particular developmental phase. Figure 4.4a shows that seed companies are funded primarily by governmental grants, which were received by 50 percent of the firms. This is followed by founders’ own investments, public debt and business angels. However, financing from family or friends, debt from commercial institutions such as banks or other credit providers, and venture capitalists are all non-existent in this phase. The high reliance on government grants differs from the situation in other countries, including the U.S. market, where government funding is considerably scarcer (see discussion in Chapter 3). The absence of venture capital and, to some extent, commercial debt is not surprising in such an early phase. However, the lack of funding from family and friends is more unexpected, particularly when comparing these results with the U.S. situation.

The funding sources used in the startup phase are similar to those used by seed ventures, although business angels enter the scene to a larger extent in this phase,

as indicated by the fact that 20 percent of these firms made use of business-angel funding (see Figure 4.4b). In this phase, 11 percent of the firms received venture capital. Family and friend funding is still very scarce; only two percent of the firms report having been financed by this group.

**FIGURES 4.4A-E: Sources used in the various phases. Percentage of firms using each source reported.**  $N_{Seed} = 38$ ,  $N_{Startup} = 45$ ,  $N_{Early} = 73$ ,  $N_{Expansion} = 56$ ,  $N_{All} = 212$ .



In the early development phase, the situation changes slightly, as depicted in Figure 4.4c. The founders now become the most common source of funding, with 40 percent of the firms reporting having been funded by their founders in this phase, in the



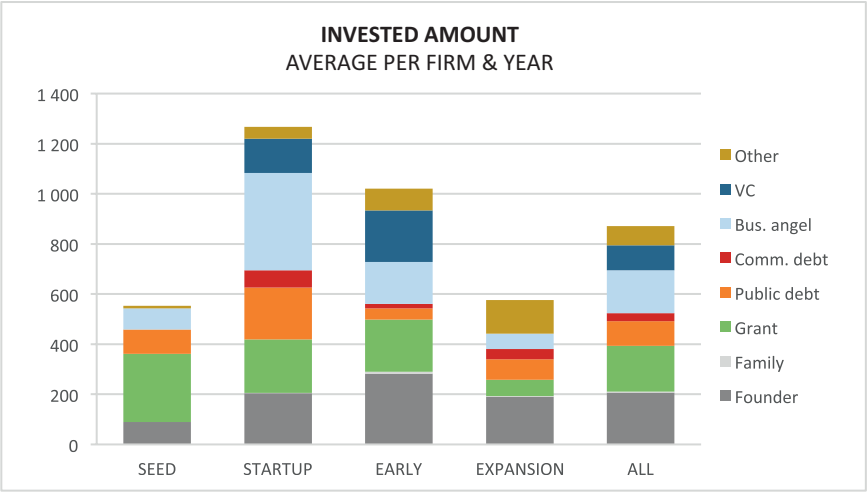
form of either equity or debt. In general, all funding sources were used to a lesser extent compared with the previous phase. This may be because more of the ventures in this phase can survive on own-generated profits that are reinvested in the firm, or it may be because external funding is even more scarce compared to the situation in previous phases. This pattern is even stronger in the expansion phase, as illustrated in Figure 4.4d, where the use of funding decreases even more. When innovative firms in their expansion phase did use financing, 38 percent of the companies report having been funded by their founders, and 11 percent report having taken on commercial debt, which includes loans and lines of credits from banks and other commercial financial institutions. Less than 10 percent of the firms in the expansion phase received grants, government loans, or funding from business angels or venture capitalists.

Taken together (see Figure 4.4e), for all firms, founders are the most common providers of funding to young innovative ventures, providing funding to close to 40 percent of the firms, followed by grants, primarily governmental, which were used by about 30 percent of the firms. Public debt was used as a funding source by 18 percent of the firms, while business angel funding was used by 13 percent. The other funding sources were used by less than 10 percent of the ventures.

### *4.2.3 Invested amount*

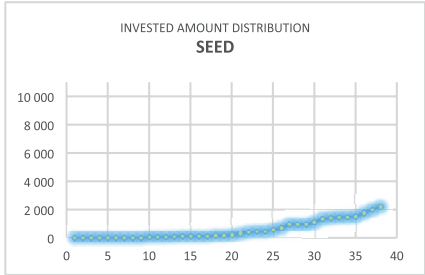
It is also interesting to investigate the amounts of money that are invested in innovative startup firms from the seed to the expansion phase. Figure 4.5 provides an overview of the average amount of capital that was invested in the firms in each phase. The average seed venture received about 500 tSEK from various sources during its first year of establishment. However, as depicted in Figure 4.6a, there is a large spread among the seed firms; 63 percent received less than 500 tSEK, while 24 percent received more than one million SEK. Significantly more money is on average invested in the startup phase, amounting to around 1.2 million SEK. The spread is also large for this group, with a vast majority, 67 percent, receiving less than one million SEK (see Figure 4.6b). Interestingly, the average level of capital invested during the early development phase is less than in the previous phase, amounting to about one million SEK. This average is further reduced in the expansion phase, during which the firms on average received less than 600 tSEK in the most recent year. For both of these two latter phases, the spread between ventures that did not receive any funding and those that received relatively high amounts is large: most firms received fairly small amounts of funding (see Figures 4.6c and 4.6d).

**FIGURE 4.5.** Average invested amount in each phase. The mean in tSEK for the respective sources for all firms in the particular phase is reported.  $N_{Seed} = 38$ ,  $N_{Startup} = 45$ ,  $N_{Early} = 73$ ,  $N_{Expansion} = 56$ ,  $N_{All} = 212$ .

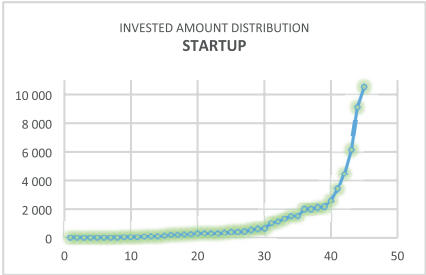


**FIGURES 4.6A.-D:** Invested amount distribution in tSEK for all investments in the various phases.  $N_{Seed} = 38$ ,  $N_{Startup} = 45$ ,  $N_{Early} = 73$ ,  $N_{Expansion} = 56$ ,  $N_{All} = 212$ .

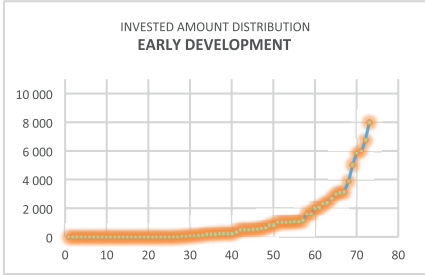
**4.6a**



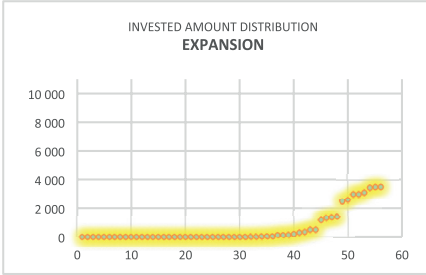
**4.6b**



**4.6c**



**4.6d**



More details about the distribution of capital among various sources are illustrated in Figures 4.7a to 4.7e, as well as in the Tables 4.2a to 4.2c, with notable differences among phases. In the seed phase, the total amount of capital from grants clearly dominates at 49 percent, followed by public debt at 18 percent, founder investments at 16 percent, and, finally, funding from business angels at 15 percent. Public sources constitute 67 percent of the total funding in the seed phase. As presented in Table 4.2a, firms that do receive grant funding receive an average of 500 tSEK, whereas seed ventures that took on public debt received about 400 tSEK on average. The four firms that received capital from business angels received an average of 800 tSEK.

The firms in the startup phase have a more diverse portfolio of funding from multiple sources. For the ventures in this phase, business angel funding represents the highest amount, although only nine out of 45 firms in this phase actually received such funding. For these nine firms, however, the average amount invested by business angels was twice that of firms in the startup phase. The second-largest financing source for the startup firms was grants, representing 17 percent of the total amount, closely followed by founder investments and public debt, both representing around 16 percent. Venture capital represented 11 percent of the total funding for companies in this phase, although only five firms were funded by this source, receiving 1.2 m SEK on average.

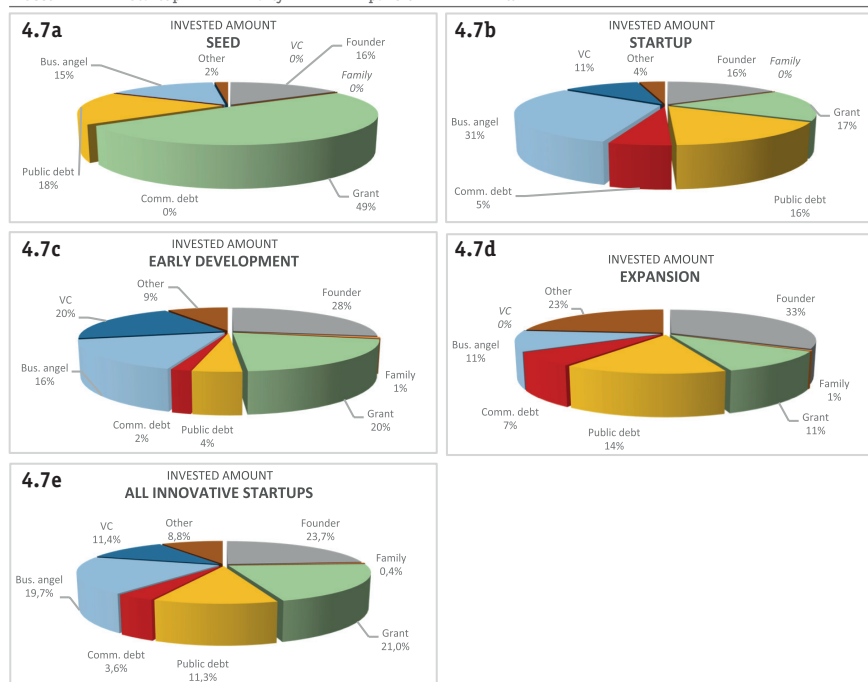
As discussed above, the average investments into ventures in their early development phase is significantly less than in the startup phase. In this phase, the funding primarily comes from the founders, 28 percent of the total capital, followed by grants and venture capital, each representing 20 percent, and finally from business angels. Few of the 73 firms in the early development phase received business angel funding, and the amount invested is on average lower compared to the previous phase. Venture capital was provided to 10 firms, with the average investment level being higher compared with the average amount in the startup phase.

The drop in investments in the expansion phase is even more dramatic. Here, founder capital represents an even larger proportion, 33 percent, followed by public debt at 14 percent and business angels at 11 percent. No firms in our sample received venture capital in their expansion phase. When analyzing the firms that received a particular type of funding, it was determined that the average totals are lower in this phase compared to the earlier phases, with the exception of public debt, which was used as a funding source by four companies, with an average amount of 1.2 mSEK.

Figure 4.7e shows the overall distribution of various sources across our sample. Founders account for 23.7 percent, grants 21.0 percent, business angels 19.7 percent, venture capital 11.4 percent, public debt 11.3 percent, 'Other' 8.8 percent, commercial debt 3.6 percent, and friend and family funding for only 0.4 percent of the invested amount. In sum, one-third of the investments stem from public sources, one-third from business angels and venture capital, about one-quarter from the founders, and less than five percent from commercial debt.

**FIGURES 4.7A-E: Split of total amount of capital invested in the various phases.**

$N_{Seed} = 38$ ,  $N_{Startup} = 45$ ,  $N_{Early} = 73$ ,  $N_{Expansion} = 56$ ,  $N_{All} = 212$ .



**Table 4.2a. Invested amount in the seed and startup phases.**

(tSEK)	SEED				STARTUP			
	Tot inv. amount	Grand mean	Mean if > 0	Count	Tot inv. amount	Grand mean	Mean if > 0	Count
Founders	3 390	89.2	211.9	16	9 190	204.2	510.6	18
Family & friends	0	0.0	-	0	50	1.1	50.0	1
Grants	10 351	272.4	544.8	19	9 616	213.7	437.1	22
Public debt	3 700	97.4	411.1	9	9 315	207.0	621.0	15
Comm. debt	0	0.0	-	0	3 100	68.9	1 550.0	2
Business angels	3 200	84.2	800.0	4	17 505	389.0	1 945.0	9
VC	0	0.0	-	0	6 150	136.7	1 230.0	5
Other	400	10.5	133.3	3	2 100	46.7	2 100.0	1
<b>TOTAL</b>	<b>21 041</b>	<b>553.7</b>			<b>57 026</b>	<b>1 267.2</b>		

The mean in tSEK, i.e., the 'grand mean', for all firms in the particular phase and the specific source of funding is reported in the second column after the label. The third column reports the mean in tSEK, i.e., 'mean if >0', only for firms with positive amounts of that source of funding. The sample size for that source is reported in the fourth column. Sample size:  $N_{Seed} = 38$ ,  $N_{Startup} = 45$ .

Table 4.2b. Invested amount in the early development and expansion phases.

(tSEK)	EARLY DEVELOPMENT				EXPANSION			
	Tot inv. amount	Grand mean	Mean if > 0	Count	Tot inv. amount	Grand mean	Mean if > 0	Count
Founders	20 580	281.9	686.0	30	10 665	190.4	444.4	24
Family & friends	600	8.2	200.0	3	130	2.3	65.0	2
Grants	15 187	208.0	799.3	19	3 625	64.7	725.0	5
Public debt	3 250	44.5	295.5	11	4 628	82.6	1 157.0	4
Comm. debt	1 300	17.8	650.0	2	2 270	40.5	378.3	6
Business angels	12 275	168.2	1 227.5	10	3 420	61.1	855.0	4
VC	15 000	205.5	3 000.0	5	0	0.0	-	0
Other	6 325	86.6	632.5	10	7 524	134.4	1 504.8	5
TOTAL	74 517	1 020.8			32 268	576.1		

The mean in tSEK, i.e., the ‘grand mean’, for all firms in the particular phase and the specific source of funding is reported in the second column after the label. The third column reports the mean in tSEK, i.e., ‘mean if >0’, only for firms with positive amounts of that source of funding. The sample size for that source is reported in the fourth column. Sample size:  $N_{\text{Early}} = 73$ ,  $N_{\text{Expansion}} = 56$ .

Table 4.2c. Invested amount total.

(tSEK)	ALL			
	Tot inv. amount	Grand mean	Mean if > 0	Count
Founders	43 825	206.7	498.0	88
Family & friends	780	3.7	130.0	6
Grants	38 779	182.9	596.6	65
Public debt	20 893	98.6	535.7	39
Comm. debt	6 670	31.5	667.0	10
Business angels	36 400	171.7	1 348.1	27
VC	21 150	99.8	2 115.0	10
Other	16 349	77.1	860.5	19
TOTAL	184 846	871.9		

The mean in tSEK, i.e., the ‘grand mean’, for all firms in the particular phase and the specific source of funding is reported in the second column after the label. The third column reports the mean in tSEK, i.e., ‘mean if >0’, only for firms with positive amounts of that source of funding. The sample size for that source is reported in the fourth column. Sample size:  $N_{\text{All}} = 212$ .

### 4.3 External funding determinants

In order to identify the factors that determine the pattern of external investments into innovative startup firms, we ran OLS regressions, as presented in Table 4.3.

**Table 4.3. Regression results from variables predicting external capital.**

External capital includes investments in terms of equity and debt funding during the last two years in the form of grants, public debt, commercial debt, business angel funding and venture capital.

	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5
Industry <sub>A</sub> : Production, materials	-.072 (-.576)	-.043 (-.350)	.098 (.801)	.071 (.583)	.049 (.410)
Industry <sub>B</sub> : SW, tele-com, electronics	-.190 (-1.319)	-.152 (-1.118)	-.062 (-.473)	-.057 (-.438)	-.035 (-.271)
Industry <sub>C</sub> : Biotech, medtech, health	-.061 (-.509)	-.034 (-.305)	.055 (.499)	.042 (.390)	.046 (.433)
Industry <sub>D</sub> : Energy	-.100 (-.787)	-.154 (-1.281)	-.048 (-.411)	-.029 (-.251)	-.042 (-.369)
Industry <sub>E</sub> : Services	-.076 (-.584)	-.056 (-.456)	.007 (.060)	.012 (.105)	-.050 (-.425)
Founder equity		.308** (3.235)	.311*** (3.442)	.298*** (3.322)	.255** (2.820)
Founder debt		.213* (2.257)	.264** (2.903)	.252** (2.803)	.275** (3.090)
Founding team			.334*** (3.485)	.318*** (3.348)	.275** (2.878)
Funding strategy				-.169† (-1.909)	-.122 (-1.360)
Foundation year					.213* (2.170)
Constant	.271 (1.061)	.238 (.988)	.015 (.062)	.016 (.069)	.045 (.197)
R <sup>2</sup>	.018	.151	.244	.271	.304
Adjusted R <sup>2</sup>	-.030	.091	.182	.204	.233
F	.374	2.536*	3.985***	4.041***	4.246***
N	107	107	107	107	107

Notes: Significance levels: \*\*\*p<0.001; \*\*p<0.01; \*p<0.05; †p<0.10 (two-tailed). Standardized regression coefficients (β) with t-values reported below within parentheses. F designates the overall significance of the model.

Model 1 shows the base model containing the control variables, with *total external capital* as the dependent variable. This model explains nothing of the variance and there is no significant industry effect. That is, the level of external capital is not industry-dependent. Next, in Model 2, we examine the effects of *founder debt* and *founder equity* on the level of external capitalization. This model explains 15.1 percent of the variance. Positive and significant effects can be noted both from *founder equity* ( $\beta = .308, p\text{-value} < .01$ ) and *founder debt* ( $\beta = .213, p\text{-value} < .05$ ). That is, founders who invest their own money, irrespective of whether it is in the form of equity or debt capital, are more likely to also be funded by external parties. This indicates that founders' investments have a positive signaling effect to external investors.

Model 3 further improves the explanation of the variance, arriving at a  $R^2$  value of 24.4 percent. The model shows that the *founding team* variable has a positive effect ( $\beta = .334, p\text{-value} < .001$ ). In other words, the larger the team at the time of founding, the better the situation from an external funding perspective. Model 4 includes the variable concerning funding strategy ( $\beta = -.169, p\text{-value} < .10$ ) and explains 27.1 percent of the variance. This is reverse-coded and indicates that having a formal funding plan increases the likelihood of attracting external capital. The final model, Model 5, tests whether firm age has any effect on the likelihood of obtaining funding from external sources. When including the *foundation year* variable, the variance explanation is further improved to a  $R^2$  of 30.4 percent, where the time of founding has a positive impact on external capitalization ( $\beta = .213, p\text{-value} < .05$ ). In other words, the younger the firm, the more external funding is attracted. This supports our descriptive results indicating that firms in their early phases face no particular challenges in getting funded by external sources, while somewhat older firms do experience funding gaps.

#### 4.4 Use of funding

The ultimate goal for capitalization of growth-oriented firms is rarely the money itself, but rather what it can be used for. In this section, we outline how the firms in our study have used their funding. On a Likert scale of 1 to 6, where 1 corresponds to 'not at all' and 6 to 'to a very high extent', the respondents were asked to indicate how they had used the funding they received. There were two sets of questions; the first concerned the extent to which the capital had been used to strengthen the organization, and the second concerned the activities that were undertaken. Only firms that received financing during the two most recent years, or since the time of founding, were included, amounting to 85 firms. Table 4.4 presents the results from the two set of questions.

**Table 4.4. Use of funding for firms in various development phases.**

		SEED	STARTUP	EARLY	EXPANSION	ALL
RECRUITMENT	R&D/product development	70%	59%	88%	57%	<b>71%</b>
	Marketing/sales	60%	32%	19%	19%	<b>27%</b>
	Production	40%	14%	16%	14%	<b>18%</b>
	Support functions	20%	18%	6%	24%	<b>15%</b>
ACTIVITIES	Marketing/sales activities	30%	23%	19%	29%	<b>24%</b>
	Product development & test	20%	18%	16%	14%	<b>17%</b>
	Geographical expansion	10%	18%	6%	24%	<b>14%</b>
	Machinery & equipment	0%	9%	9%	10%	<b>8%</b>
	Premises & facilities	0%	9%	0%	5%	<b>4%</b>
	IPR	0%	5%	3%	5%	<b>4%</b>

Responses from respondents who (i) represent firms that received funding in the most two recent years, or since the time of foundation, and (ii) have responded to the question, are included. Percentages (%) representing answers with a 4, 5 or 6 on a 1-6 Likert scale are presented.  $N_{\text{Seed}} = 10$ ,  $N_{\text{Startup}} = 22$ ,  $N_{\text{Early}} = 32$ ,  $N_{\text{Expansion}} = 21$ ,  $N_{\text{All}} = 85$ .

When analyzing the responses related to recruiting, uses in the R&D, or product development, area received the highest scores, irrespective of firm development phase. More specifically, 71 percent of the firms that did receive funding during the two most recent years, or since the time of founding, indicate that it had been used for purposes in the domain of product development; the responses here ranged from 57 percent to 88 percent in the various phases. Investments in marketing and sales, both in terms of recruitment and investments, received the second highest scores, around 25 percent. Here, however, there are more variations between the various company phases. Firms in their seed phase are particularly keen on strengthening marketing and sales, both in terms of new hires, 60 percent, and monetary investments, 20 percent, while considerably fewer respondents, about 19 percent, identified this area as particularly important as a use for funding during the early development or expansion phases.

Less than 20 percent of respondents stated that the capital has been used for recruitment in the area of production, and only 15 percent of the firms used the capital to strengthen their support organization. Of the firms in the expansion phase,



24 percent stated that the funding was used for geographical expansion, while such activities are less heavily prioritized in the other phases.

4.5 Funding choices

In order to gain a better understanding of why some firms do not make use of certain types of funding, three sets of questions regarding commercial debt, business angel funding and venture capital were analyzed.

4.5.1 Reasons for not using commercial debt

Figure 4.8a illustrates to what extent the 113 firms in the study made use of commercial debt in the form of loans or credit lines from banks or other commercial financial institutions. Commercial debt is a rare occurrence in the results of the study, as discussed previously. Only nine observations were recorded in total. No firm in the seed phase made use of commercial debt, while one observation was identified in the startup phase; two in the early development phase, and six in the expansion phase.

Of the remaining 104 firms that did not use commercial debt during the last two years, or since the time of foundation, 45 firms reported having no interest in bank funding, six said that they already have commercial debt, and 21 firms did not provide any explanation for not using this funding source. Of the firms that did not use bank funding, 32 (31%) stated that they would have liked to get commercial debt financing, but that their application had either already been rejected or was expected to be.

FIGURE 4.8A. Use of commercial debt. During the two most recent years or since the time of foundation for all firms included in the survey. N=113.

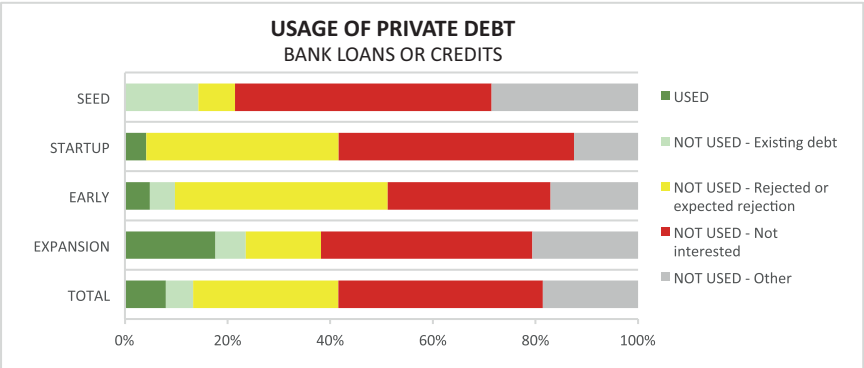
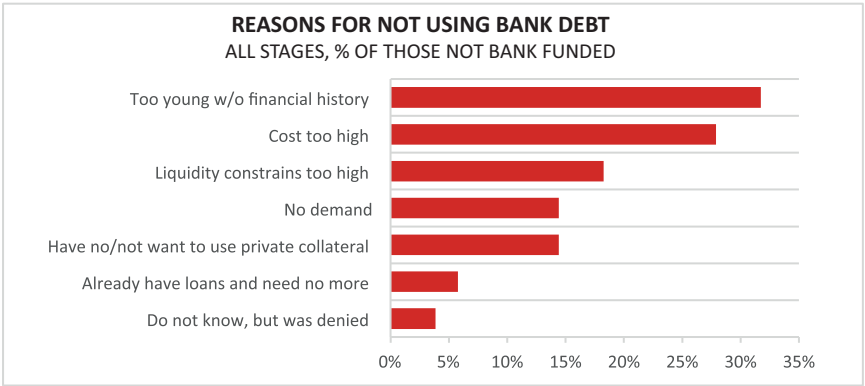


Figure 4.8b provides more details about why the 104 firms did not use commercial debt. The most common reason, stated by 32 percent, is that the firms perceive themselves as being too young and hence lacking a strong financial history. Approximately 28 percent of the respondents reported that they perceive the costs associated with lending to be too high, while 18 percent reported liquidity constraints as a reason. A total of 14 percent indicated that they are not in a need of commercial debt, while 14 percent reported that either do not have or do not want to use private collateral. 14 percent reported that either do not have or do not want to use private collateral. 14 percent reported that either do not have or do not want to use private collateral.

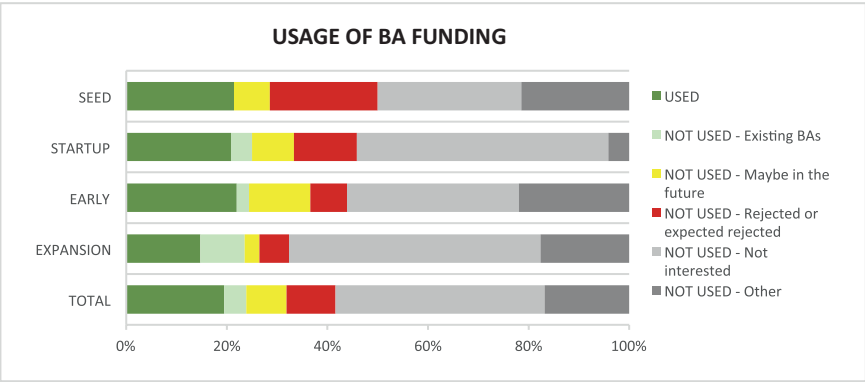
**FIGURE 4.8B.** Reasons for not using commercial debt. Only firms without commercial debt funding during the last two years, or since the time of foundation, were included. N=104.



**4.5.2 Reasons for not using business angel funding**

Our sample includes 22 firms, 19 percent, that have been financed by business angels. Business angel funding was used by firms in all four phases during the last two years, as illustrated in Figure 4.9a.

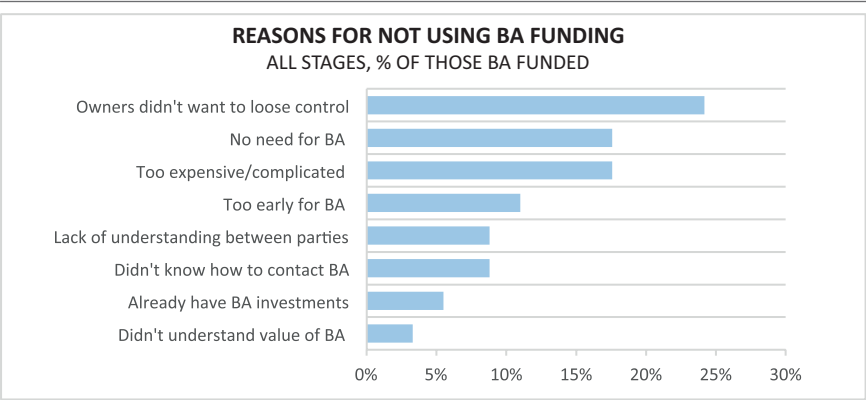
**FIGURE 4.9A.** Use of funding from business angels. During the two most recent years or since the time of foundation for all firms included in the survey. N=113.



If also including firms that had previously received capital from business angels, about 20 percent of the firms in our sample have used this specific source. Close to 40 percent of the firms in the sample reported that they are not interested in business angel funding. The highest proportion of rejections, or expected rejections, from business angels appears in the seed phase, while the rejections are fewer in the other phases, particularly in the expansion phase.

Figure 4.9b outlines more detailed reasons why the firms are not funded by business angels. The most common reason is that the current owners, often the firm founders, do not want to lose control of their firms; 24 percent of the 91 firms expressed this sentiment. A total of 18 percent of founders expressed that they have no need for business angel funding; 18 percent also said that they consider it to be too expensive or too complicated. Of the firms not using business angel funding, 11 percent said they perceive themselves to be at too early a stage in their development to do so, while nine percent indicated that there is a lack of understanding between business angels and entrepreneurs. Another nine percent of the respondents stated that they did not know how to get in contact with business angels.

FIGURE 4.9B. Reasons for not using funding from business angels. Only firms without business angel funding during the last two years, or since the time of foundation, were included. N=91.



4.5.3 Reasons for not using venture capital

Across our sample of 113 firms only nine, or eight percent, used VC funding. There were no VC observations for firms in their seed phase, four observations during startup, and four during the early development phase; one of the firms in the expansion phase was funded by venture capital. Moreover, only eight percent of the firms state that they are interested in making use of this type of financing in the future. A vast majority of the respondents, 44 percent, claim that they are not interested in this funding source, and 15 percent stated that they either have been, or expect to be, rejected after seeking VC. Moreover, the percentage of firms that do not see

venture capital as a possible source decreases with age. This is somewhat surprising, since firms in somewhat later phases are expected to be more suitable for VC funding than are firms in their very early phases.

FIGURE 4.10A. Use of venture capital funding. During the two most recent years or since the time of foundation for all firms included in the survey. N=113.

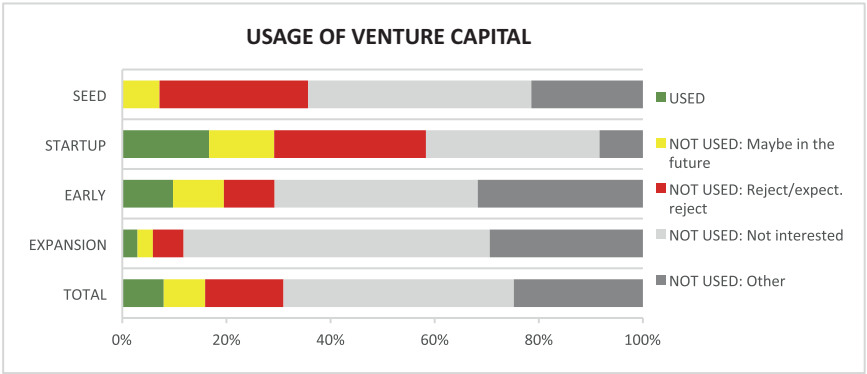


FIGURE 4.10B. Reasons for not using venture capital funding. Only firms without venture capital funding during the last two years, or since the time of foundation, were included. N=104.

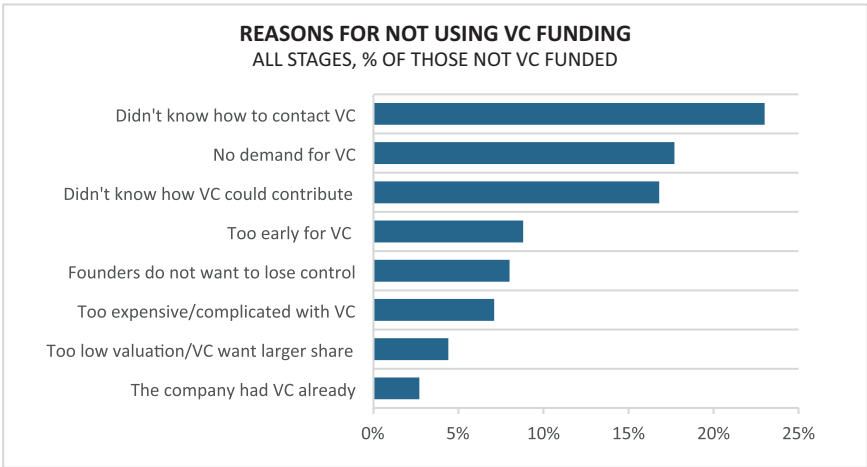


Figure 4.10b provides more detailed responses as to why the 104 firms that have not received venture capital in the last two years, or since the time of foundation, are not funded by venture capital. The most common reason for not using VC is that

respondents reported not knowing how to contact a venture capital firm, which 23 percent of respondents indicated. A total of 18 percent of the firms stated that they do not need this type of funding, 17 percent reported that they do not understand how a VC could contribute to the development of their firm, while eight percent have avoided venture capital because they do not want to lose control.

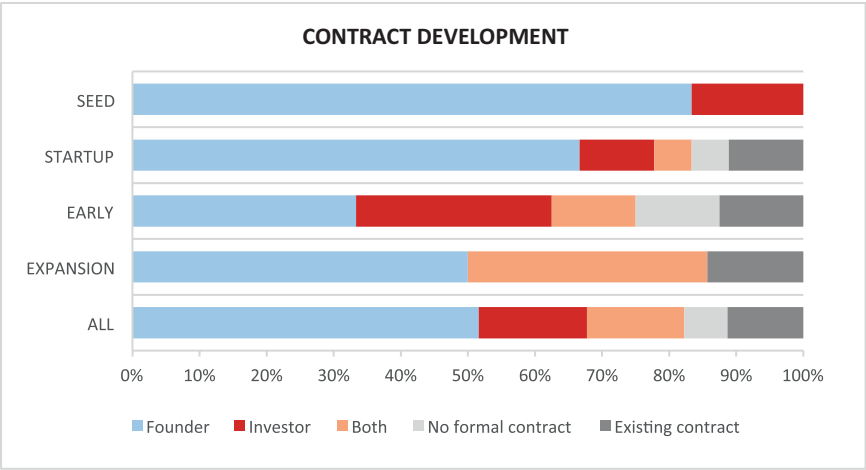
4.6 Contracts, valuation and financing plans

4.6.1 Contract development and valuation

As discussed in Section 2.4, we also investigate to what extent equity investors use formal shareholder’s agreements as a key tool to maintain control over their investee firms.

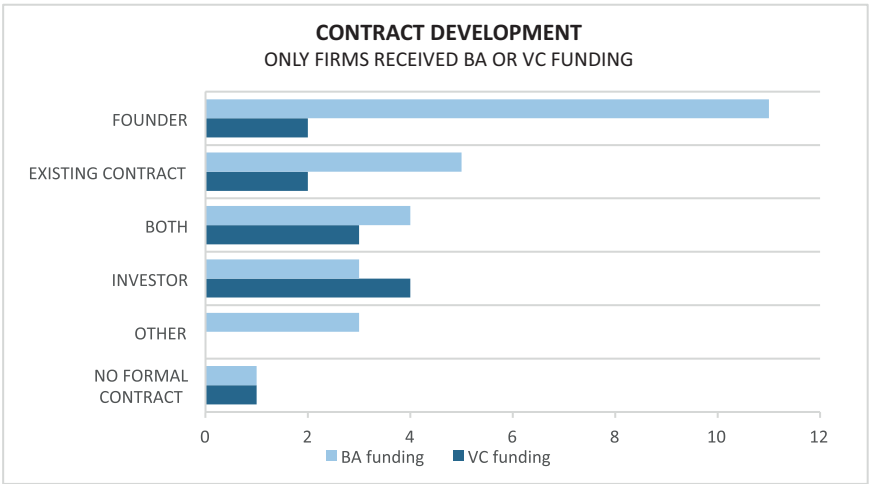
The results point in another direction. Figure 4.11a illustrates whether the investor or the founder has the overall responsibility for the development of contracts. In our study, approximately 50 percent of all contracts were put together by the founders or their legal advisors. In the seed phase, the founders were responsible for the contractual process in more than 80 percent of the cases. The same pattern is evident in the startup phase, where the founders were responsible in more than 60 percent of the cases. The investor has a larger impact in the early development phase, where almost 30 percent of the contracts were developed by the investor. In the expansion phase, the founders have control of the contractual process in 50 percent of the cases, and for the other half, there is a shared responsibility between the entrepreneurs and the investors. It is also noteworthy that 10 percent of the respondents stated that they have no formal contracts that regulate the ownership between the investors and the entrepreneurs.

FIGURE 4.11A. Responsibility for contract development. N=62.



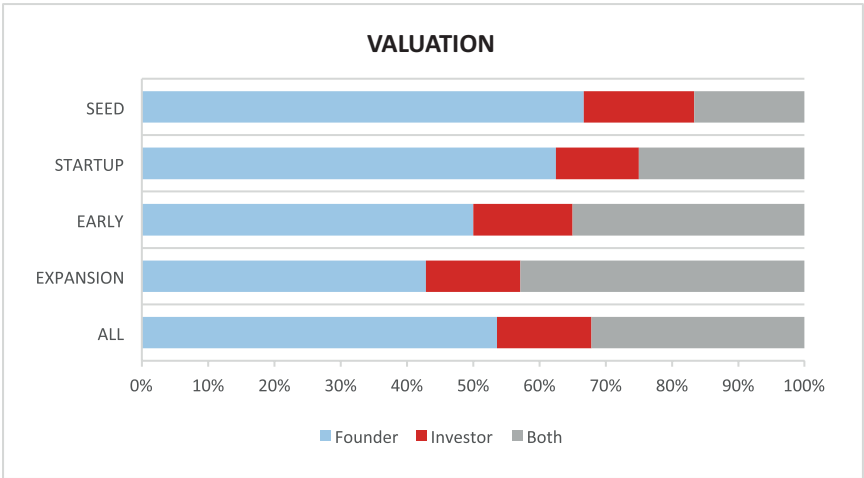
When only including the companies that have used business angel funding or venture capital, some differences can be noted for the two types of investors, as depicted in Figure 4.11b. While the founders seem to take control over the process of outlining contracts when negotiating with business angels, the situation is different when venture capitalists are involved, a situation in which the investors maintain control in a majority of cases.

**FIGURE 4.11B.** Responsibility for contract development. Only business angel- or VC-funded firms included.  $N_{BA}=27$ ,  $N_{VC}=12$ .



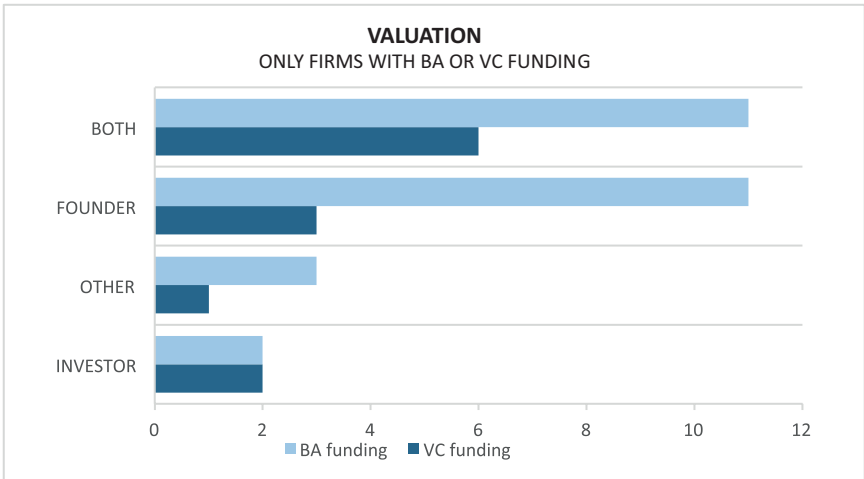
According to theory, the determination of firm valuation is also a way for investors to exert control. However, here we see a similar pattern emerge, in that the founders seem to assume greater control over the process, as depicted in Figure 4.12a. The results show that the founders took the lead role when deciding upon firm valuation in over 50 percent of our observations. When looking across all phases, the same pattern is evident. More than 60 percent of all valuations during the seed and startup phases were set by the founders. Around 50 percent of the valuations during the early development phase were made by the founders, and in the expansion phase, this amounted to around 40 percent. It is evident, however, that the parties are more likely to jointly decide upon valuation for somewhat older firms. It is most common that the entrepreneurs, along with the investors, agree upon valuation during the early development and expansion phases. However, it is rare that investors are solely responsible for setting firm value; this was found to have occurred in only 10 percent of cases.

FIGURE 4.12A. Responsibility for setting firm valuation. N=56.



When only evaluating firms that have received either business angel or venture capital funding, the pattern is somewhat different, as shown in Figure 4.12b. In the case of business angel funding, firm values are predominantly set by either the founders or by the founders and investors in collaboration. When venture capitalists are investing, it is somewhat rarer that the founders are fully responsible for firm valuation, although it is even less common that investors have the sole responsibility for deciding upon the valuation of the firm.

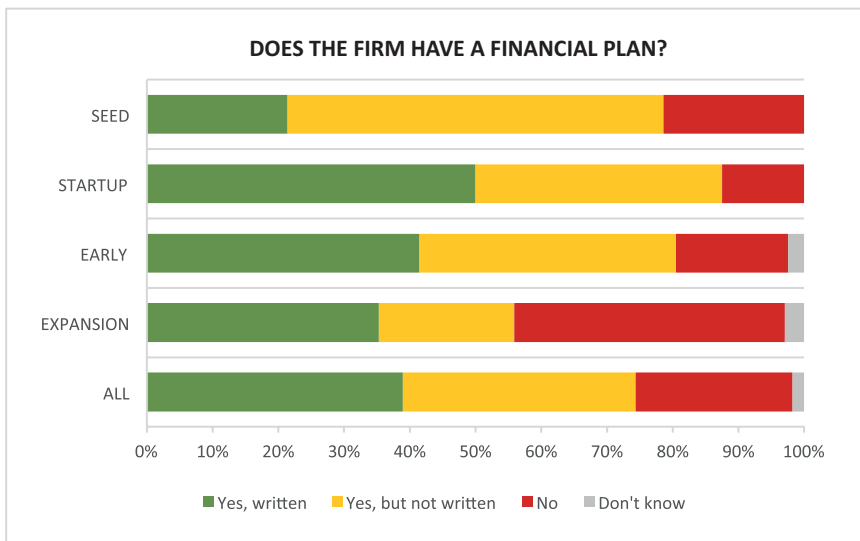
FIGURE 4.12B. Responsibility for setting firm valuation. Only business angel- or VC-funded firms included.  $N_{BA}=27$ ,  $N_{VC}=12$ .



#### 4.6.2 Financing plans

Finally, we investigated to what extent the firms in our study have plans that outline future funding needs and strategies for how to capitalize the ventures. Of the 113 firms in our sample, 39 percent report that they have a written financial strategy, 36 percent state that they have a financial plan that is not in writing, while 24 percent indicate that they do not have any financial plan at all (see Figure 4.13a).

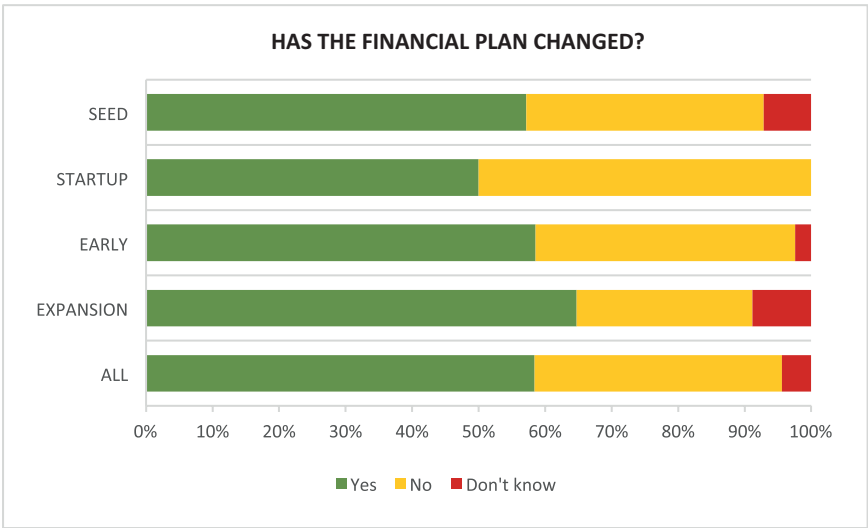
**FIGURE 4.13A.** Existence of a financial plan.  $N_{\text{Seed}} = 14$ ,  $N_{\text{Startup}} = 24$ ,  $N_{\text{Early}} = 41$ ,  $N_{\text{Expansion}} = 34$ ,  $N_{\text{All}} = 113$ .



The plan is not written in stone, however. Of the 113 firms, 60 percent reported that their financial plan changed over time, as illustrated in Figure 4.13b. When asked why the plan changed over time, a few reasons were provided. The most common reason cited for changing the firm's funding strategy is that more capital than estimated was needed, forcing the firm to deviate from the existing plan when a more opportunistic ad-hoc search for funding was necessary. Another reason put forward as to why funding strategies had changed is that new owners had opposing views on how the business should be financed in the future.



**FIGURE 4.13B.** Change of the financial plan.  $N_{Seed} = 14$ ,  $N_{Startup} = 24$ ,  $N_{Early} = 41$ ,  $N_{Expansion} = 34$ ,  $N_{All} = 113$ .



4.7 Summary

This study has investigated the funding sources used by Swedish innovative startup firms with growth ambitions in four phases: seed, startup, early development and expansion. The funding sources investigated were (i) internal, which includes capital from the founders as well as from family and friends, and (ii) external, constituting funding in the form of grants, public debt, commercial debt, business angel and venture capital.

The results show that one-third of these firms have not used any form of funding, neither internal nor external, during the two most recent years (or since the time of firm foundation for younger firms). Capital from founders constitutes the single most common form of funding, used by 40 percent of the firms. This is in line with extant research (Berger and Udell, 1998; Bozkaya and Van Pottelsberghe De La Potterie, 2008; Revest and Sapio, 2012). More surprising is that funding from family and friends has been very limited for the firms in our study, used by less than three percent of the ventures. This contradicts the findings from U.S.-based studies, where investments from the ‘FFF’ group, i.e., family, friends and fools, are often identified as a significant source of capital for startup firms (Bygrave et al., 2003; Campbell and De Nardi, 2009; Bates and Robb, 2013). This seems to indicate a country-specific variation, which has also been noted in a study about the situation in Belgium (Bozkaya and Van Pottelsberghe De La Potterie, 2008). Instead, grants, primarily from government sources, are used by a large number of innovative startup firms in Sweden. In

our study, more than 30 percent of the ventures were financed by grants. Public debt provided by governmental or regional agencies or municipalities is also a common source of funding for Swedish ventures, used by more than 18 percent of the studied firms. That public funding is common in the very first stage of a company's existence is to be expected. However, for the ventures in this study, public funding continued to be an important source of capital throughout all four phases of development, which is more surprising and contradicts extant research. The literature, which comprises primarily U.S.-based studies, shows that government support is used to a significantly lower extent (Berger and Udell, 1998; Robb and Robinson, 2010). However, a study of the capitalization of Irish startup firms also identified government funding as a significant source of capital (Hogan and Hutson, 2005). Business angel funding is used by 13 percent of the ventures in our study, which is line with earlier research (e.g., Bhaird and Lucey, 2011). Commercial debt is a rather uncommon source of funding in our study, used by less than five percent of the ventures. This supports the widespread contention that young businesses in high-growth industries more often rely on equity-based funding, while debt funding is scarcer (Berger and Udell, 1998; Carpenter and Petersen, 2002; Robb and Robinson, 2010); although it contradicts more contemporary research showing that commercial debt in fact is common also in these type of firms in case of limited risk businesses (Vanacker and Manigart, 2010; Minola and Giorgino, 2011). Though some of our findings support those arrived at in earlier research, there are also some clear differences. This indicates that country-specific factors may be important when explaining variances in capital structures in young firms, in accordance with the arguments put forward by Jøeveer (2013).

When analyzing the average amount of capital invested, the relatively low sums invested in Swedish innovative firms are striking. This, however, follows earlier research suggesting that small firms with fewer tangible assets and larger proportions of qualified employees (which is likely the situation for the innovative firms with growth ambitions that we study) report encountering particularly significant obstacles when seeking access to external financing (Revest and Sapio, 2012). Also, in terms of actual funding totals, the founders represent the largest contributors, followed by grants and business angel funding. While only five percent of the firms in our study have been financed by venture capital in the most recent year, once VC has been granted, the amounts disbursed are, on average, significantly larger than those from other funding sources.

The funding situation in the later phases of firm development merits additional consideration. On the one hand, 34 percent of the firms in the early development phase and more than 50 percent of the firms in the expansion phase reported not using any funding, whether internal or external. Moreover, the average amount of external capital is significantly lower in firms operating in the later phases compared with the situation of firms in the seed phase and, particularly, the startup phase. This suggests that somewhat older firms may be able to survive on internally generated profits. On the other hand, in the two later phases, financing from founders

constitutes around 30 percent of the total funding amount, while founder investments represent only 16 percent in the two previous phases. This finding indicates that Swedish innovative startup firms in their early development and expansion phases are in need of funding and cannot survive on internally generated profits alone. Instead, the founders often choose to, or are forced to, invest own capital. Furthermore, while commercial debt does become more common in the expansion phase, representing seven percent of the invested amount, this is still considerably lower compared to the conventional wisdom, which holds that somewhat older firms are likely to have a greater proportion of debt and lower shares of internal funding compared with younger startup firms (Berger and Udell, 1998; Cassar, 2004). Our regressions also support the descriptive findings that younger startup firms attract more external capital than do older firms. Taken together, the results suggest that there is indeed a funding gap – not in the earliest stages of company development, but in the somewhat later phases.

Concerning possible determinants of external funding, our regression results suggest that it is important for founders to invest their own money into the business. We interpret this as a signaling effect, where founder investments signal commitment and thereby a reduction of moral hazard risk for external investors, as well as for potential lenders. Young firms founded by larger teams, as opposed to those funded by individual entrepreneurs, are also favored by investors. This could be because the presence of a larger team signals commitment and thereby better functionality. To some extent, a larger team may also reduce risk, since the business is not dependent on a single individual. Furthermore, the results show that if the startup has a written funding strategy, the likelihood of attracting external capital increases, likely because such a plan functions as a signal of professionalism.

When analyzing the purposes for which funding has been used, the study clearly shows that investments into R&D, or, more generally, product development, are most common. More than 70 percent of the ventures in our study reported using funding to strengthen their R&D departments. Following that, but to a significantly lesser extent, firms reported making investments in marketing and sales activities.

Next, we investigated why certain firms chose not to use a particular type of funding. More than 30 percent wanted to use commercial debt, but considered their ventures to be too young and thus lacking the requisite collateral or positive cash flows necessarily for bank financing. Only 15 percent stated that they are not in need of commercial debt. It is interesting to note that almost 40 percent of the firms stated that they do not have any interest in business angel funding; very few consider business angel funding to be important in the future. The risk of losing control was put forward as the major reason for not inviting business angels as investors. The percentage of firms that do not consider venture capital as a possible funding source decreases with firm age. This is somewhat surprising, since firms in the somewhat later phases are typically regarded as being more suitable for VC funding than are firms in their very early phases of development. To summarize, our findings suggest that both supply- and demand-related reasons exist for firms choosing not to use

the three types of external funding: commercial debt, business angel funding and venture capital.

Finally, we studied who takes the responsibility of developing contracts between investors and founders in cases where external equity financing is awarded. When only including the companies that state that they have received business angel funding or venture capital, some differences can be noted between business angels and venture capitalists. While the founders seem to take control over the process of outlining contracts when negotiating with business angels, the venture capitalists maintain stronger control over the process. This supports the arguments put forward by Van Osnabrugge (2000), who argued that VCs are more likely to try to mitigate investment risk through an *ex ante* approach, whereby contracts constitute the major tool for attaining and maintaining control, while business angels apply an incomplete contract approach, exerting control through *ex post* investment activities.



## Conclusions and recommendations

Innovative startup firms with growth potential are regarded as playing vital roles in society, not only by pioneering new industries but also by bringing innovation into established but fragmented markets. As a result, such firms are considered especially important contributors to innovation, job creation and, ultimately, economic wealth. As such, policymakers invest a great deal of effort into facilitating and developing a flourishing climate for young innovative firms. One formidable challenge facing these firms concerns their financial situation. This study aims to contribute to the growing body of research on funding for innovative startups by investigating the Swedish situation. By collecting unique data for a set of high-potential, innovative young ventures, we were able to investigate how this category of companies behave financially, as well as studying their relationships with external capital providers. Our analysis focused on seven 'S's': sources, sums, stages, spending, structure, strategy, and selection.

Starting with the sources, our study shows that as many as one-third of the firms did not use any funding, whether external or internal. For the firms that are funded, the dominant source of funding is the founders themselves. The finding that most firms are funded by their founders supports earlier research. More surprising is the finding that family and friends are virtually entirely absent as providers of capital, while government funding is used by a large number of the studied firms. Moving to sums, one conclusion of the study is that the average amounts invested in the companies are remarkably low. Also, in terms of total funding amounts, founders and public sources dominate, representing one-quarter and one-third, respectively, of the total invested capital. External equity, in the forms of business angel funding and venture capital, adds up to almost one-third of the funding, meaning that although relatively few firms are capitalized by external equity, once it has been granted, the sums disbursed are rather substantial. Contrary to many other contemporary studies

about debt funding, loans from banks and other commercial institutions were found to be very limited in terms of both prevalence and funding amounts not only in the earliest but also in the somewhat later phases.

In a deeper analysis of capital structures throughout the firm life cycle, it appears that most of the investments are made in the earliest phases of firm development, while the supply of capital to somewhat older firms is more limited. In other words, it does not seem to be a problem for firms to obtain startup funding, but it does appear to be more difficult for them to secure funding for expansion over time. Studying the spending patterns, it is evident that most of the investments are used for internal operations, i.e., primarily for product development, rather than for sales and marketing activities. Looking at structure and strategy, our results indicate differences in how business angels and venture capitalists choose to exert control over their investee firms. Specifically, control mechanisms in the forms of contracts and firm valuation are not used by business angels, but are employed to a greater extent by venture capitalists. It is also interesting to note firms' explanations of why certain types of financing have not been used. The most common reasons put forward for eschewing particular funding categories are that the respondents consider their firm to be too young to pursue such a path, and that external capital is too expensive. Regarding business angel funding and venture capital, the reluctance to lose control of firm operations is also raised as a major concern.

Finally, when it comes to selection, the results show that the ventures most likely to obtain funding are those started by teams rather than by individuals that have developed a funding strategy and in which the founders have invested their own money.

In sum, our study indicates that Swedish innovative startup firms (i) in general are undercapitalized in relation to their potential, as assessed by a range of innovation specialists, (ii) often utilize many funding sources with very limited amounts per source, (iii) are most likely to use public (i.e., government) funding in the forms of grants and public debt, while funding from families, friends, and commercial debt providers is almost non-existent, and (iv) are more likely to face funding gaps in the later rather than the earliest phases of firm development. Finally, (v) well-prepared teams with a developed funding strategy and which have signaled commitment via self-investment receive more funding.

When analyzing the findings from a supply-and-demand perspective, it appears that the financing market for young innovative firms is not entirely functional. On the demand side, we would expect our sample companies, being a homogenous group of innovative firms with strong growth potential, to have relatively ready access to capital. Instead, our study shows that the founders are neither fully (i) prepared (for example, often lacking a clear funding strategy) nor (ii) aware of the potential of available funding sources, as well as harboring misconceptions about how various players in the funding industry operate. For example, while equity investments do dilute firm ownership, this does not necessarily mean that the founders lose control. Moreover, international studies clearly show that bank loans constitute a vital source

of funding for a large number of young innovative firms, particularly in the somewhat later phases, which should also be the case for Swedish ventures. In sum, there seems to be a competence and experience gap regarding entrepreneurs' ability to plan for, identify and attract external funding, especially during the somewhat later stages of firm development.

On the supply side, we identify problems in the domains of information, concentration, and structure. The limited amount of debt funding reported by study participants is, again, surprisingly low in comparison with the situation in other countries, particularly in the later phases of firm development, when cash flows are expected to be positive and assets are likely to be more plentiful and tangible. To some degree, this could be interpreted as being information-related, in that banks and other commercial debt providers need to improve their distribution of information and marketing to this category of firms. Furthermore, the concentration of funding among firms in the earliest phases of development again contradicts the received wisdom that it is the youngest firms that suffer the most from capital constraints. Instead, this points to a crowding issue among financiers; they may be able to benefit from also investing in firms in the later phases of development when risk is lower and competition has decreased. From a governmental perspective, it seems that there are a large number of transactions, but each transaction is limited in scope and time. This implies that there is a high transaction cost for each investment for the investors and particularly for the startup firm, which requires the entrepreneurs to continuously look for small amounts of money rather than focusing more attention on developing their ventures.

Implications for entrepreneurs derived from this study include the need to be better prepared by enhancing their understanding of the full spectrum of funding alternatives; developing a funding strategy; investing own capital alongside funds from external investors; and looking for larger amounts of money when seeking funding for their businesses. The seemingly widespread misconceptions about funding sources imply that equity investors and debt providers ought to enhance the informational material and communication channels to innovative startup firms, as well as broadening their scopes to invest more frequently and in larger amounts in somewhat older startup firms.

Turning to policy, it is clear that the government dominates the funding landscape for young innovative firms. Given Sweden's historical legacy of being a powerful state with a strong presence in society, this is not surprising, but it is a fact that needs to be taken into careful consideration when developing strategies for how to nurture the funding market for young innovative firms. In other words, policymakers and other stakeholders need to stake out a path that is consistent with the Swedish context, rather than imitating strategies used in other regions. Assuming that the government will continue to play a central role in this arena, we suggest three roads forward. First, firm founders will most likely continue to be major providers of funding to their own ventures, which is important not only from a capital perspective, but also as a means of providing a positive signaling effect to external investors. Thus, one suggestion is to grant individuals the means by which to accumulate private funds to invest in their



own, or into other, startup firms. This could be done via, for example, a deduction of investments against capital income and/or income on labor. Second, we suggest that the sheer number and variety of government programs and funding schemes should be reconsidered, and ultimately, streamlined and consolidated. Currently, entrepreneurs searching for funds must navigate a fragmented, needlessly complicated environment, which in turn causes the search process to be unnecessarily time-consuming. Merging a number of these programs could potentially lead to a more efficient structure for both supply and demand. For example, one large, consolidated investment fund could work with investments and one large, consolidated debt fund could work with debt. Such a solution is likely to reduce transaction costs for all parties, as well as increase the amount of capital being invested, as a consequence of both cost reduction and a more efficient selection strategy. Third, the finding that a vast majority of investments, whether from public or private sources, are channeled into firms in the very early phases of development, while the availability of funding is scarce for slightly older firms, is problematic on several levels. This leads to undercapitalized firms that are unable to expand in timely manner and ultimately are more likely to fail. As such, we propose that government funding should be more broadly allocated to firms in all phases of development without disturbing the market mechanism that should be the driving force behind such decisions.

As with all empirical studies, this study is not without limitations, one of which is the relatively small sample used. Another limitation is that we have only investigated the Swedish situation, making it somewhat difficult to make reliable comparisons with studies focusing on other regions. However, we believe that we have been able to identify a number of interesting insights about the financial structures that are prevalent among one of the most important groups of firms: innovative startup firms with growth ambitions. Further, we believe that these findings will aid policymakers in the process of developing new ways to support these ventures.

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# Om författarna

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# Appendix

## Appendix 1. Finance for startup glossary

Term	Definition
Bootstrapping	Methods used to meet the need for resources without relying on long-term external finance from debt holders and/or new owners.
Business angels	Private individuals investing a proportion of their assets directly into unquoted companies to which they have no family connections. Business angels provide both funding and business expertise in return for equity (also known as Informal venture capital investors).
Buyout (BO)	A transaction financed with a mix of debt and equity in which a business, business unit or company is fully or partly acquired from other share-holders. Buyout capital is a subset of private equity.
Commercial debt	Debt provided by commercial bank or other financial institutions in the form of credit lines or loans.
Corporate venture capital firm	A VC firm that is tied to a larger organization where the parent organization allocates capital from internal sources. Corporate VCs fund innovative businesses set up by their own staffs, or invest in external ventures active in industries considered to be of strategic importance.
Crowdfunding	The practice of funding a project or venture by raising small amounts of money in the form of equity or loan from a large number of individuals who network and pool their money, typically via the internet.
Early development phase	Here defined as young ventures that have completed their startup phase, have developed their first product or service, and have made initial sales, though the firm is still, most likely, unprofitable. In this report, firms in their early development phase are between two and four years old.
Equity investor	Invests capital into a firm in exchange for ownership. Includes business angels, venture capitalists, buyout firms, etc.
Exit	Liquidation of holdings by an equity investor. Among the various methods of exiting an investment in a portfolio firm are: (i) initial public offering, (ii) trade sale, (iii) sale to another PE firm or financial institution, (iv) company buyback, or (v) write-off.
Expansion phase	Here defined as young firms that have left their early development phase, have started to generate revenues, may or may not break even, and are seeking to grow and expand the business into new markets or expand operations. In this report, firms in their early development phase are five years old or older.
Grant	Typically non-repayable funds disbursed by public authorities, foundations or corporations that usually must be used for predefined purposes. A grant is a particular type of subsidy.
Innovative startup firm	Here defined as young firms that develop and sell products or services considered to be innovative by putting resources to use in hitherto untried practice areas, and which have growth ambitions.
Investee firm	See entry for 'Portfolio company.'
IPO	When a company first makes its shares generally available to the public through listing on a securities exchange.
Portfolio company	The company or entity into which a business angel, VC or BO firm invests (also known as Investee company). The full set of companies currently backed by such investors is referred to as an investment portfolio.
Private equity (PE)	The professional provision of capital and management expertise to companies in order to create value and subsequently, with a clear view to an exit, to generate capital gains after a medium-term to long-term holding period. Private equity consists of three types of investment classes: business angel investments, venture capital and buyout capital.
Public debt	Soft loans provided by governmental or regional authorities with comparatively lenient terms and conditions as compared to other loans available in the market.
Seed phase	Here defined as very young ventures with a business idea that has not yet been established, i.e., the concept still needs to be proven and developed. In this report, firms in their seed phase are younger than one year old.
Startup phase	Here defined as young firms that have left their seed phase and are past early research and development, but which need additional funding to sell and market their products and services. In this report, firms in their seed phase are about one year old.
Subsidy	Economic benefit in the forms of direct payments (e.g., grants, loan guarantees, favorable loans) and indirect support (tax allowance, rent rebates), typically provided by a government to support a desirable activity including promoting entrepreneurial activity and startup firms. A subset of subsidies is grants.
Venture capital (VC)	A subset of private equity, referring primarily to equity investments made into privately owned companies with large growth potential in their seed, startup, early development or expansion phases.

Appendix 2. Correlation table

Descriptive statistics and correlations for variables predicting external capital.

	MEAN	S.D.	N	1	2	3	4	5	6	7	8	9	10
1. Total external capital	1 114.5	2 160.4	113										
2. IndustryA: Product, material	0.12	0.33	113	.139									
3. IndustryB: SW, Telecom, Electronics	0.31	0.46	113	-.074	-.252**								
4. IndustryC: Biotech, medtech, health	0.09	0.29	113	.129	-.117	-.209*							
5. IndustryD: Energy	0.13	0.34	113	.054	-.147	-.262**	-.122						
6. IndustryE: Services	0.16	0.37	113	-.095	-.164	-.292**	-.136	-.170					
7. Founder equity	324.7	931.1	113	.119	-.120	-.115	.030	.154	-.051				
8. Founder debt	68.1	198.5	113	.257**	.108	.017	-.072	.095	-.040	.047			
9. Founding team	2.71	3.35	109	.086	-.147	.008	-.077	-.093	.002	-.028	-.095		
10. Founding strategy	1.86	0.79	112	-.193*	-.137	.049	-.062	.138	.018	-.013	.036	-.097	
11. Firm age	8.78	2.71	113	.113	-.019	-.222*	-.044	-.036	.313**	.059	-.126	.130	-.241*

Significance levels: \*\*\*p<0.001; \*\*p<0.01; \*p<0.05.



I rapporten *Sources of capital for innovative startup firms* beskrivs hur kapitalförsörjningen ser ut för svenska innovativa startupföretag i Sverige. Bristande finansiering utpekas ofta som ett hinder för framväxt och utveckling av dessa företag, vilket är ett problem eftersom innovativa startupföretag anses spela en viktig roll för tillkomsten av nya arbetstillfällen och ekonomisk tillväxt.

Det finns många, både interna och externa, finansieringskällor tillgängliga för startupföretag i Sverige. Rapporten definierar aktörer och finansieringskällor samt presenterar resultat från ett antal internationella studier som undersökt hur unga och små företag finansieras. Finansieringskällan varierar stort beroende på vilken fas företaget befinner sig i. I rapporten framkommer att finansiering brister främst i expansionsfasen – både från banker och statliga låneinstitut. Författarna lyfter också att entreprenörer inte alltid är fullt förberedda för kapitalisering eller har tillräcklig god kunskap om alternativa finansieringslösningar.

Rapporten ges ut inom ramen för Näringspolitiskt forum som är Entreprenörskapsforums mötesplats för frågor rörande det svenska näringslivets utveckling och svensk ekonomis långsiktigt uthålliga tillväxt. Ambitionen är att föra fram policyrelevant forskning till beslutsfattare inom politiken såväl som inom privat och offentlig sektor.

Rapporten är författad av Anna Söderblom och Mikael Samuelsson, båda ekonomer och forskare och lärare vid Handelshögskolan i Stockholm.



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