AMSTERDAM AS THE NEW STARTUP HUB. A COMPARATIVE STUDY ON THE CONTROL ALLOCATION IN THE FINANCING STRUCTURE OF DUTCH STARTUPS

P.R. (Rosalynn) de Jong

Student number: 2016395

Defense date: 11 June 2018

Master International Business Law

Supervisor: L. Tavecchio

Second reader:

PREFACE

Passion gets an entrepreneur through the startup days and the enormous efforts it takes to build a business.

Peter Diamandis

Some things in life take enormous efforts, like reading eight hundred pages of constitutional law in order to pass your exam. It is like climbing a mountain while carrying a backpack full of stones; step for step, purely based on coffee and willpower (and the gnawing fear of failing your exam, and having to read the book again for the state law resit) you power through. However, these enormous efforts evaporate when you see the panoramic view painted by other, more interesting topics. These views give you an extra pair of imaginary wings, and because of these newly found intrinsic interests, you pursue the knowledge and insights promised by these views. And the more you learn, the more colourful the panoramic view, and the more alluring the way upwards.

This thesis started with a modest idea to investigate how the Dutch startups could be made more successful. (Although I'm no patriot, I just happen to know more of Dutch startups than of Peruvian startups, hence the choice.) However, after browsing hundreds of articles about all the aspects of financiers only PhD students could have the creativity to think of, the initially modest idea was expanded, and my heart sometimes sank to the bottom when discovering that the new aspect also included dozens of interesting references. However, the theoretical framework as combined result of all the relevant literature can be a guide in the various aspects of financing a startup. The second part of this thesis focused on the empirical analysis, to determine the current state of affairs in the Netherlands, from a financial perspective. This was followed by an empirical comparison between these statistical results of the Netherlands and five other successful startup countries, as well as a comparison between the theoretical framework and the Dutch empirical statistics. The results show that it is clear that there are still several opportunities for improvement.

To conclude, passion and hard work go hand in hand, two intertwined companions, both sparking, whether this passion becomes visible in the entrepreneur's goal of founding the new Instagram, or in the student's goal of attending Graduation's Day.

ACKNOWLEDGEMENTS

This thesis would not have been possible without the interesting stories and valuable feedback of my thesis supervisor, Luca Tavecchio. Thank you for your flexibility, and your fast responses.

A special thanks to my mother, for all the long phone calls, and my father, who gave his best efforts in providing extra data sources and encouragement. And of course my big brother, for ridiculing my English and thereby inspiring me to do something about it; as well as the good habit of drinking coffee, which complements writing.

TABLE OF CONTENTS

List of Tables

List of Figures

List of Abbreviations

ANOVA-test	A statistical test to determine whether the means of more than two groups are significantly different from each other, known as "Analysis of Variance-test".
B.V.	The Dutch private company, known as "Besloten vennootschap".
DEU	ISO-country code for Germany.
EU	European Union.
F-value	The value of the ANOVA-test, which determines whether the means of the subgroups within the group are significantly different from each other.
GBR	ISO-country code for the United Kingdom of Great Britain and Northern Ireland.
GDP	Gross domestic product.
IPO	Initial public offering, i.e. going public by selling shares to the general public.
IRR	Internal rate of return, i.e. the effective return on an investment.
ISO-code	The country-code, as issued by the International Organization for Standardization.
ISR	ISO-country code for Israel.
M&A	Mergers and acquisitions.
NACO	National Angel Capital Organization, i.e. the national association to advance angel investing in Canada.
NLD	ISO-country code for the Netherlands.
OECD	The Organisation for Economic Co-operation and Development.
PE	Private equity.
p-value	The probability of finding the described results, when the null hypothesis is true.
R&D	Research & development.
Round A	The first financing round by venture capitalists.
Stata	A software program for statistical analysis.
SWE	ISO-country code for Sweden.
t-value	The value of the t-test, which determines whether the means of two groups are significantly different from each other.
U.S.	Adjective used for the United States of America.
USA	ISO-country code for the United States of America.
VC	Venture capitalist.

1. INTRODUCTION

The economic world is increasingly being characterized by disruption: industries such as the taxi industry, hotel industry, and the retail industry are changed; according to research, these industries are improved for the customer and the new providers.[1] The consumers benefit from lower prices because of increased competition, and more convenience. The new providers increase the current market or create a completely new market, thereby benefiting themselves, at the expense of the established providers.[2] So some parties gain from a new product (or service or innovation), and other parties lose. An example is Airbnb: Although the provided housing service is beneficial for tourists, the residents of Amsterdam are disadvantaged: the real estate prices are driven up, making it far harder and more expensive for them to buy a house in Amsterdam.[3]

The disrupting ideas are mainly envisioned and created by new entrepreneurs in the industry.[4] Although the majority of startups fails[5], the surviving companies may be able to transform the way of producing and delivering goods and services, and create demand for an entirely new product market or technology market. The introducer of this new product may be able to capture a large share of the market, the so-called winner-takes-all effect for the first mover.[6] This first mover advantage is the result of technological innovation and thus lower costs, economies of scale, or avoiding switching costs for consumers.[7] Network effects – the phenomenon that the benefits of adopting a network product grow as the total number of adopters increase – may also account for a large part of the market value of digital firms, like Facebook.[8] Although achieving a first mover status is not necessarily equal to long-term success, [9] the advantages still inspire companies to compete in a race to be the first successful introducer.

High-growth startups are advantageous for the country in which they are located. Economic advantages brought by these successful startups are higher economic growth and reduction of unemployment, as well as the development of infrastructure in the place where the startup is located.[10] A recent example of a successful startup with regard to economic growth and employees is Instagram: this social media site was launched in 2010, and had $3.64 billion revenues and 500+ employees in 2017.[11] Furthermore, in developed countries, the presence of high-growth startups seems to positively affect innovation and R&D investments.[12] It should be noted that not all startups provide these advantages; the so-called gazelles (high-growth startups) contribute the major part of these benefits.[13]

Countries differ in the quantitative amount and qualitative success of their domestic startups and startup ecosystems. In 2017, the Netherlands was no. 19 in the worldwide startup ranking.[14] In the ranking of

[1] Berger, Chen & Frey 2017; Zervas, Proserpio & Byers 2016; Deloitte 2017.
[2] Zervas, Proserpio & Byers 2016.
[3] ING 2016.
[4] Christensen 1997, p. 34.
[5] Estimates are ranging from failure rates between 50-52% after five years for new businesses, although sole proprietorships were not included in these data, Bureau of Labor Statistics 2016, Chart 3 and Table 7. Another estimate for the failure percentage of startups backed by venture capital is 75%, for not completely returning investors' capital, and 30-40% for completely losing all investors' money. *See* Ghosh 2012.
[6] Arthur 1989.
[7] Lieberman & Montgomery 1988.
[8] *See* Flint, P., '70 Percent of Value in Tech is Driven by Network Effects', *Linkedin.com* 15 January 2018 (date retrieved: 24 May 2018).
[9] Financial Review 2016; Ethiraj & Zhu 2008.
[10] Wong, Ho & Autio 2005.
[11] Statista 2018.
[12] Anokhin & Wincent 2012.
[13] Wong, Ho & Autio 2005; Shane 2009; Henrekson & Johansson 2010.
[14] Startup Genome 2017.

European countries, the Netherlands was no. 4.[15] To rise in these rankings, and become the most important startup hub in Europe, the Netherlands will have to improve the current startup ecosystem. It is important to have an overview of the characteristics that may increase the chance of successful startups, which also contributes to the forming of a vibrant ecosystem in which startups can thrive and grow (meanwhile increasing GDP and employing people). According to the research of Startup Genome[16], the Netherlands should improve the access to talent and the access to funding.[17] Funding is a necessity for startups. Without funding, it is harder to develop products, and cover the costs of marketing and research. There are several financing options for startups, varying from personal credit lines to venture capital, bank loans, angel investments, and government subsidies.[18]

Two birds can be killed with one stone if the financing factors of successful startups are outlined, and are used to optimize the funding to Dutch startups. In that way, the current funding of Dutch startups can be improved, and based on the higher success of the current startups as result of the improved funding, additional funding may be attracted.

Relevance

To the best of my knowledge, there has been no in-depth empirical research on the actual performance of Dutch startups with regard to financing, compared with startups of other countries. Neither has there been research on the use of legal instruments in the financing of Dutch startups. My thesis can fill this gap in literature.

In this thesis, a theoretical framework will be drafted based on an extensive literature review. This theoretical framework consists of four layers: the startup in general, the parties involved in the startup (the entrepreneur and the financiers), and the financial structure used by the parties, and the control allocation as laid down in the financing contract.

The second part of this thesis consists of an empirical analysis of the financial data of CrunchBase. This analysis includes the statistics of the average total funding achieved by Dutch startups, and whether this total funding differs depending on the age of the startup and the status of the startup. The average financing round amount of startups will also be investigated, including the question whether this financing round amount differs depending on the used type of funding. These empirical statistics will also be obtained for five other successful countries (the United States, the United Kingdom, Germany, Israel, and Sweden). A short qualitative analysis of the financing rounds of two Dutch startups will shed light on how the financing structure and control allocation in financing contracts has been arranged. In the third part of this thesis a comparison is made between the Netherlands and these five other countries, on the basis of the empirical results. The second comparison is a comparison of the current situation in the Netherlands with the theoretical framework.

In general, besides the recommendations to the Dutch government on how to improve the financing options of promising startups, it is also highly relevant to learn how the financing form determines the protection of equity investors versus founders and other stakeholders, like creditors. Changing certain guarantees or covenants in contracts may lead to a different risk and control distribution, thereby increasing the success rate of startups, as well as the willingness of financiers to finance. Optimizing the financing structure and the contractual recording of the consequences of this financing structure for Dutch startups is therefore highly relevant, from a financial as well as a legal perspective.

[15] EU Startups 2017.
[16] Startup Genome is an organization that researches and benchmarks startup ecosystems globally.
[17] Startup Genome 2017, p. 77.
[18] Nofsinger & Wang 2011, p. 2285.

Research question and structure thesis

The research question of this thesis is:

"How can the allocation of control in the financing structure (as laid down in the contract with the financier) of Dutch high-growth startups be improved?"

In the 2nd chapter the existing literature will be investigated, to provide an overview of the factors that constitute a successful startup and startup ecosystem. Furthermore, the person and incentives of the entrepreneur and the financiers (angel investor, venture capitalist, bank, government) will be discussed. This chapter will be concluded by outlining the optimal capital structure for a high-growth startup, as well as the derived optimal control allocation in the startup financing structure. Although the goals and incentives of the entrepreneur and financiers are discussed, the main focus is on achieving the high growth of the startup, using (or avoiding) the goals and incentives of the participating parties.

The Dutch startups will be analysed in the 3rd chapter, to determine the typical financing structures (quantitative analysis) and control allocations (qualitative analysis) that are used in the Netherlands. The theoretically derived control allocation in the financing structure (as described in chapter 2) will be complemented in the 4th chapter by the empirical analysis of the financing structures of startups in countries with a thriving ecosystem, on the basis of financial data. The examined countries are the United States, the United Kingdom, Germany, Israel, and Sweden. A further analysis is performed in the 5th chapter: a comparison between the Netherlands and the other countries, in order to derive clues from the empirical results how the Netherlands differ from other successful startup countries. It also describes the differences between the theoretical framework and the empirical results. The 6th chapter concludes and gives several recommendations to Dutch startups, financiers, and the government.

2. LITERATURE REVIEW

The goal of this chapter is to discuss the principles and strategies to mitigate agency problems which are described in theoretical and empirical studies about startups and financing, and their legal consequences. This theoretic discussion is valuable, and necessary to discover the several cause-effect relationships. For example, a certain firm characteristic (i.e. one of the causes) may lead to the use of less debt (i.e. effect) because of a specific moral hazard problem (i.e. explanation of cause-effect relationship). The exploration of these relationships may shed light on why certain firms obtain a specific form of capital, and which legal instruments are used to mitigate problems inherent to that form of capital.

This theoretic framework will form the fundament for the recommendations in Chapter 6: when the theoretical background for the financing mix of successful startups is outlined, the results can be translated back into the factors that caused these outcomes. The first step is to determine which financier(s) are the most beneficial for the success and growth of the start-up, and the second step is to determine the relevant factors for these financiers in their decision whether or not to finance a company. By implementing or improving these factors, startups in the Netherlands may be able to achieve the same success, as a result of applying the same strategy that other startups already successfully applied. As a simplified example, when the startup's growth is on average higher when lending is obtained from a small bank, the factors that a small bank considers important in their lending decision to finance the startup should be investigated (for example, collateral), and these factors should be applied by the startup. Hopefully, the financier is more likely to finance the startup, and the result of the obtained financing of that specific financier improves the chance of the startup.

The outline of this chapter will be as follows. In Paragraph 2.1 a general framework will be sketched with the factors that may be relevant for the success of a startup and startup ecosystem. This includes funding, but also talent, immigration, global reach, and government funding. In Paragraph 2.2 and 2.3 the incentives of the parties involved in the financing contract of the startup are discussed. These parties include the entrepreneur and his team, the equity financiers (angel investors and venture capitalists), and debt financiers (banks), as well as financing by public grants. By elaborating on the incentives of these parties, and the problems they encounter in achieving their goals, the factors for not obtaining the optimal funding will become clearer. After discussing the parties' incentives, some theoretical and empirical findings about the debt-equity financing decision will be discussed in Paragraph 2.4. A concise framework will be drafted, which describes the optimal financing for a successful high-growth startup. In the second part of Paragraph 2.4 the optimal control allocation will be derived from the optimal financing. The findings will be summarized in Paragraph 2.5.

2.1 Framework successful startup and startup ecosystem

2.1.1 Successful startup

Definition

According to the dictionary, a startup is "a fledgling business enterprise"[19], or "a business or undertaking that has recently begun operation"[20]. Not all startups are the same, and not all startups are successful in terms of generating economic prosperity and employment. According to Shane, "the typical startup is not innovative, creates few jobs, and generates little wealth".[21] These meagre economic results are caused by the suboptimal goal with which the typical startup is established, namely a form of self-employment instead of the creation of a high-growth firm.[22] Necessity-based entrepreneurs are pushed into a business because there is no other option for making a living ("the refugee phenomenon"), whereas opportunity-based entrepreneurs are pulled into a business to pursue a lucrative business opportunity.[23] Startups established by the second group are more successful and more valuable than startups established by the first, necessity-based group. This is confirmed by the study of Wong et al.: they researched whether entrepreneurship activity in general significantly increased economic growth. Their results were that only the high potential subgroup[24] of entrepreneurship significantly impacted economic growth.[25] The same result was confirmed for employment: most employment growth is generated by a few fast-growing firms, and these firms are often younger firms.[26]

It becomes clear that not all startups are able to provide the economic benefits. To be able to investigate the distinctive factors of successful startups, a specific definition is needed to define the startup that can achieve the desired economic benefits, such as innovation and employment. Following the literature, the central point seems to be the high growth, which ultimately leads to the realization of the potential. There are different concepts of growth, such as sales, employees, assets, market share, or profits.[27] Depending on which concept of growth is used, the "proven" relationship can change.[28] Therefore, the chosen concept of growth should be based on a theoretic rationale. For example, when studying manufacturing firms which are capital intensive, the concept for growth will be assets rather than employees.[29] In studies that involve multiple industries, sales data are more appropriate, because sales is a more neutral measure of growth.[30] The best indicator of firm growth is sales; however, for high-technology startups the growth in sales may be preceded by the growth in assets or employment, making the growth in sales less reliable.[31] Growth can be measured in absolute terms (total sales) or relative terms (percentage change).[32]

---

[19] Merriam-Webster Dictionary 2018.

[20] The American Heritage Dictionary of the English Language 2018.

[21] Shane 2009, p. 143-145.

[22] Idem ditto, p. 142.

[23] Henrekson 2007, p. 6.

[24] Wong et al. define the high potential group by using four characteristics: potential for employment growth, market impact, globalized customer base, and use of new technology.

[25] Wong, Ho & Autio 2005, p. 341, 344.

[26] Henrekson & Johansson 2010, p. 240.

[27] Delmar et al. 2003, p. 193.

[28] Weinzimmer 1998, p. 250.

[29] Weinzimmer 1998, p. 252.

[30] Weinzimmer 1998, p. 252.

[31] Delmar et al. 2003, p. 194.

[32] Measuring absolute growth favors large firms, whereas measuring relative growth favors small firms. Although the measure of relative sales growth is used in most studies, a more complex, superior formula for growth also uses the middle years, by regressing firm size on time by using the quarterly data points, and thereby estimating a beta coefficient for the growth; the disadvantage is that at least 15 observations are needed for a reliable estimate. If the beta-measure is not used, the method of total percentage change compared to the first year is preferred to the average percentage change per year. *Source: Weinzimmer 1998, p. 237, 239-240, 243, 250-253.*Weinzimmer 1998, p. 237, 239-240, 243, 250-253.

For this thesis, I have chosen two concepts of growth, based on the literature written by Weinzimmer[33] and Delmar et al.[34]. The first one is market value: the startup in its first life phase may not have sales yet (making the sales as concept of growth less reliable), but the market value already reflects the high innovation potential which is foreseen by investors. If market value is not available, the tangible assets will be used as a substitute.[35] The supportive concept of growth is sales, because sales is a neutral and easy measure. For the growth measure the average percentage change per year will be used.[36]

Concluding, a successful startup is in this thesis defined as "a starting business with a fast-growing market value and preferably fast-growing sales", as the combined definition of the dictionary definition and the concepts of growth. The "fast" growth is, out of simplicity, defined as being in the upper ten percent of the growth rates in the country or industry. The ultimate goal of a successful startup is to grow fast, become big, and eventually contribute to the economic growth of the country, resulting in higher employment, tax revenues, and innovation.

General factors successful startup

In the literature, several factors are discerned that establish the success of a startup. These factors can be categorized into three groups (adapting the classification of Geibel & Manickam)[37]:

1. Personal factors

These factors can be controlled by the founders. These include a strong team with prior entrepreneurial experience, a mission and passion for a great product, huge demand for the product and ability to scale, a business model that solves a problem, a strong pitch, and a working culture of communication.[38]

2. External factors

These factors are the result of the startup's environment, and the founders have little or no control over these factors. These factors include political stability, competitors, and access to talent.[39]

3. Support from financier

These factors can be controlled by the financiers, and include mentorship, financial funding, provision of legal and business support, and the provision of a network.[40]

Each of these factors can accelerate or delay the blooming of the startup, and should therefore be assessed in the startup analysis. Each of these factors may lead to a different outcome in the courses of two otherwise identical startups.

[33] Weinzimmer 1998, p. 237-253
[34] Delmar et al. 2003, p. 193-194
[35] The internally generated intangible assets are not recognized on the balance.
[36] These two concepts of growth are based on the literature of Weinzimmer and Delmar et al., and slightly changed by the author to be applicable on the research of startups; Although the estimated beta coefficient is a superior method, the data necessary to estimate such a coefficient may not be available for most startups.
[37] Geibel & Manickam 2016, p. 1-2.
[38] Feinleib 2012, p. 21, 47, 101; Geibel & Manickam 2016, p. 1-2; Korunka et al. 2010, p. 1030.
[39] Geibel & Manickam 2016, p. 1-2; Korunka et al. 2010, p. 1031.
[40] Geibel & Manickam 2016, p. 1-2; Korunka et al. 2010, p. 1036; Brüderl & Preisendörfer 1998, p. 224.

2.1.2 Successful startup ecosystem

Definition and stages of an ecosystem

Startups should be supported by a good environment. Larger startup ecosystems have startups with a faster growing valuation, and a higher rate of success to get a round C from venture capitalists.[41] An ecosystem is "the complex of a community of organisms and its environment functioning as an ecological unit", as defined in the dictionary[42].

An ecosystem can find itself in different stages of development, ranging from a starting ecosystem to a top system. There are various names for the phases of the ecosystem life cycle model. The first, qualitative interpretation of the model starts with the emergence phase (the first few dozen startups are founded within a small neighbourhood, but there is almost no funding nor access to talent), the activation phase (growth is accelerated by copying successfully employed strategies of other ecosystems), followed by the integration phase (generating success stories and exits to attract resources from across the nation), and finally the maturity phase (a balanced set of resources, the relative growth slows down).[43]

The second, quantitative interpretation is the following: The first phase (activation) hasa low number of startups (below 1,000), and the objective in this phase is to grow a larger and more connected community.[44] The second phase (globalization) knows some large exits (higher than $100 million) which distinguishes this ecosystem as the best place in the nation to build a startup; the objective is to connect with other global ecosystems.[45] In the third phase (expansion) the ecosystem has grown to 2,000 startups and reached an exit of over $1 billion; the objective is to fill the remaining resource gaps in talent or funding.[46] When the fourth phase is reached (integration), the resources are balanced and the ecosystem is competitive with other top ecosystems; the objective is to integrate the ecosystem in the rest of the nation's economy.[47] See **Figure 1** for a visual overview of the four phases. Each phase has its own challenges, for example, in the expansion stage it is harder to find experienced engineers compared to the globalization stage.[48]

[41] Startup Genome 2017, p. 26.
[42] Merriam-Webster Dictionary 2018.
[43] Compass 2015, p. 9-13.
[44] Startup Genome 2017, p. 15.
[45] Startup Genome 2017, p. 15.
[46] Startup Genome 2017, p. 15.
[47] Startup Genome 2017, p. 15.
[48] Startup Genome 2017, p. 18.

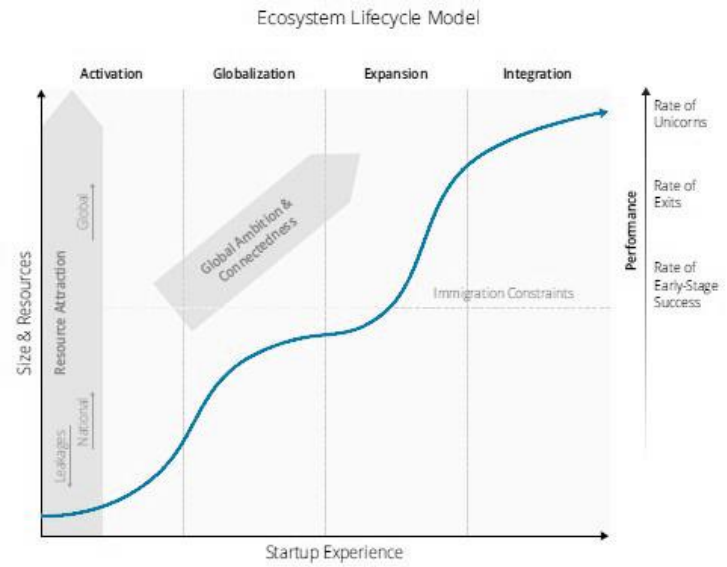


Figure 1: The Ecosystem Lifecycle Model. Source: Startup Genome 2017, p.16.

Success factors ecosystem

The various ecosystems have been compared by Startup Genome[49] and the University of Navarra.[50] The ranking of Startup Genome, is based on the following question: in which ecosystem does an early-stage startup have the best chance of building a global success?[51] The final ranking is based on the success factors that are important for having a vibrant startup ecosystem, namely:[52]

1. Performance, i.e. the ecosystem value, exit value, startup valuations, and unicorns;
2. Resources:
   - Funding, i.e. the access to early-stage funding and venture capital funding, and the presence of experienced VC-firms;
   - Talent, i.e. the access to experienced engineers, the engineer salaries, and coding contests;
   - Resource attraction, i.e. the attraction of new entrepreneurs and startups;
3. Other factors:
   - Market reach, measured by the percentage of foreign customers;
   - Startup experience, i.e. how experience is recycled;
   - Global connectedness, i.e. the local and international founder's relationships;
   - Corporate involvement, i.e. the interest of corporations to work with startups;
4. Founders, i.e. the ambition to go global.

The analysis of the various countries shows that each startup ecosystem has its own highlights: Silicon Valley is great at attracting international talent, London and New York City have great access to financial resources, Beijing has huge government investments in startups, Tel Aviv has the highest rate of early-stage startups, Berlin has an influx of immigrants' talent, Los Angeles has its creativity as well as eager adoption of the new products by its residents, and the Netherlands has its innovation and excellent infrastructure.[53]

[49] [49] Startup Genome is an organization that researches and benchmarks startup ecosystems globally.
[50] See the methodology of Kaufmann Foundation 2015 for the more abstract indicators of entrepreneurial vibrancy.
[51] Startup Genome 2017, p. 8.
[52] Startup Genome 2017, p. 27-28.
[53] Startup Genome 2017, p. 41-80.

Another way to compare several ecosystems, is by measuring the attractiveness of a country for investors. The University of Navarra researched the important factors for venture capitalists and private equity investors, to consider a country attractive for investors:[54]

1. Economic activity, i.e. economic prosperity and GDP growth;
2. Depth of capital market, i.e. well-developed stock markets that allow IPO-activity and M&A activity;
3. Taxation, i.e. tax rates, and low administrative burdens;
4. Investor protection and corporate governance, i.e. the quality of the legal system, strong property rights and legal enforcement;
5. Human and social environment, i.e. education, flexible labour market policies, and no corruption;
6. Entrepreneurial culture and deal opportunities, i.e. low administrative burden for patents, and simplicity of starting and closing a business.

In **Table 1** a short overview is given of rankings of countries by Startup Genome (startup ecosystem) and University of Navarra (country attractiveness for VC and PE). The rankings are similar: all the countries in the top 20 (with the exception of France) are also in the ranking of University of Navarra, with the United States and the United Kingdom clearly being the front runners in the rankings.

Table 1: A comparison between the rankings of Startup Genome and the University of Navarra

No. in ranking	Startup Genome	Startup Genome countries	University of Navarra
1	Silicon Valley (United States)	United States	United States
2	New York (United States)	United Kingdom	United Kingdom
3	London (United Kingdom)	China	Canada
4	Beijing (China)	Israel	Hong Kong
5	Boston (United States)	Germany	Japan
6	Tel Aviv (Israel)	France	Singapore
7	Berlin (Germany)	Singapore	Australia
8	Shanghai (China)	Sweden	Germany
9	Los Angeles (United States)	Canada	New Zealand
10	Seattle (United States)	Australia	Denmark
11	Paris (France)	Netherlands	Sweden
12	Singapore	India	Netherlands
13	Austin (United States)	Brazil	Malaysia
14	Stockholm (Sweden)	South-Korea	Norway
15	Vancouver (Canada)		Switzerland
16	Toronto (Canada)		Finland
17	Sydney (Australia)		Israel
18	Chicago (United States)		China
19	Amsterdam (Netherlands)		Ireland
20	Bangalore (India)		Belgium

Note that the second column gives the official ranking of Startup Genome, and the third column the ranking with only the countries. Source: Startup Genome 2017, p. 29, 33; IESE Business School University of Navarra 2018, p. 17.

It is important to note the existence of ranking persistence: the top cities in recent years were also in the top ranking twenty years ago.[55] New startup hubs do not magically appear, but they have their basis in a history of strong technology sectors, or experienced strong growth in the past decade. [56] These cities have had many years of spinoffs and entrepreneurial reproduction.[57] The adoption of a specific startup program may be an indication of the underlying strength of the region, instead of the cause of new

[54] IESE Business School University of Navarra 2018, p. 8-11, 13.
[55] Kaufmann Foundation 2013, p. 2.
[56] Kaufmann Foundation 2013, p. 16.
[57] Kaufmann Foundation 2013, p. 16.

startup activity.[58] This research indicated that, in order to boost a thriving ecosystem, more is needed than just the implementation of startup program; all the underlying factors for a thriving ecosystem need to be improved. [59]

In this first paragraph the general factors to achieve a successful startup and startup ecosystem were described, as the first layer of the pyramid. In the next paragraph the initiator and driver of this startup success will be discussed: the entrepreneur. Who is the entrepreneur, why did he found his startup, and what are his motivations?

[58] Kaufmann Foundation 2013, p. 13.
[59] Kaufmann Foundation 2013, p. 16.

2.2 Incentives of the entrepreneur

Definition

An entrepreneur is "one who organizes, manages and assumes the risks of a business or enterprise".[60] Jean-Baptiste Say gave the first definition (around 1800) of an entrepreneur: "the entrepreneur shifts economic resources out of an area of lower and into an area of higher productivity and greater yield".[61] Schumpeter added the element of innovation, by defining that the entrepreneur's function is to "reform or revolutionize the pattern of production by exploiting an invention or, more generally, an untried technological possibility for producing a new commodity or producing an old one in a new way". [62] This innovation leads to creative destruction across markets and industries, and creates new products and business models. The element of value creation was added by Drucker, who made a distinction between real entrepreneurs who create a new market, and entrepreneurs who open another small business without creating customer demand.[63] Combining these elements leads to the following description of an entrepreneur: "someone who adds value, and by exploiting new possibilities and converting these into goods or services, creates new consumer demand".

Person of the entrepreneur

The entrepreneur plays a major role in ensuring a fast growth and long life for the startup. The entrepreneur as human being can have a positive as well as a negative effect on the success of the startup: certain personal characteristics of this entrepreneur (like greed and overconfidence) have a negative effect on the employees and the social network of the startup, and therefore on the success of the startup.[64] On the other hand, the entrepreneur an also be a valuable asset for the startup, with positive factors being experience,[65] education,[66] and reputation[67]. These factors will be described, insofar as they are relevant, when describing the factors that the specific financiers consider important.

Goal and side effects

The entrepreneur[68] is the driving force behind the creation and the growth of a new enterprise. The invention of a new idea is just the beginning: after countless changes in the drafts the product itself becomes viable, which simultaneously introduces additional responsibilities, such as accounting, writing a business plan, obtaining funding, recruiting other persons, and marketing. These responsibilities require a lot of time and effort. Nevertheless, entrepreneurs are still dedicated and invest their time and effort into founding new startups. There are two kinds of explanations for this dedication: financial and non-financial explanations.

The financial explanation is the potential profit that can be achieved, by introducing a product that adds value for consumers. The financial expectations for setting up an enterprise differ. Necessity-based entrepreneurs are pushed into a business because there is no other option for making a living, whereas

[60] Merriam-Webster Dictionary 2018.
[61] Butler-Bowdon 2010.
[62] Schumpeter 1942, p. 132.
[63] Drucker 1993, p. 21.
[64] Haynes, Hitt & Campbell 2015, p. 480, 485.
[65] Baum & Silverman 2004, p. 427.
[66] Paik & Woo 2014, p. 115.
[67] Berger & Udell 2006, p. 2952.
[68] Only the entrepreneur is mentioned for simplicity reasons, but this includes the team around the entrepreneur.

opportunity-based entrepreneurs are pulled into a business to pursue a lucrative business opportunity.[69] The Global Entrepreneurship Monitor also distinguishes in their data research between self-employment and real entrepreneurship, to separate their effects on the entrepreneurial activity.[70] The opportunity-driven entrepreneurs are the "real" entrepreneurs within the meaning of the aforementioned definition. These entrepreneurs seek entrepreneurial rents as reward for providing a scarce particular talent, for example by introducing an innovative product.[71]

Non-financial explanations for founding an enterprise include the desire to have control over the company,[72] the building of reputation,[73] a flexible working life, business experience or personal growth, or just the enjoyment of a side hobby. The altruistic wish to end malaria (Bill & Melinda Gates) or enabling life on other planets (Elon Musk) are other non-financial explanations.[74] Because the non-financial goal is hard to measure, this thesis will focus on the financial explanations for starting a new company.

To reach the financial goal, the entrepreneur invests his money, and his vision and ideas about the product. Entrepreneurs generally receive modest salaries, so their incentive is the high exit value.[75] Ideally, the exit value is high, to compensate for the risks and invested time of the entrepreneur. Although the average exit value for the entrepreneur is $9 million, this number is sharply skewed by the mega-exits.[76] Almost 70% of the exit values result in 0 – 1 million dollars for the entrepreneur, with 20% being 1 – 10 million dollars, and the remaining exit values are above 10 million dollar.[77] This research shows that the majority of entrepreneurs with the financial goal of becoming a millionaire will not reach this financial goal.

The financial incentives of the entrepreneur may pose problems for the parties that finance the enterprise, if the goals of the entrepreneur do not align with the goals of the financier. Each of the financiers is to a greater or lesser extent affected by these problems, and each financier has a different approach in solving them. These specific approaches will be discussed in Paragraph 2.3 for the parties separately.

According to the classical agency model, with the financier being the principal and the entrepreneur being the agent, several problems may occur in the relationship between the entrepreneur and the financier:

1. Adverse selection

Adverse selection indicates that the "costs of dishonesty" that are caused by asymmetrical information in the period before concluding the financing contract.[78] When the seller has more information about the quality of a good than the buyer (who only has information about the market as a whole), the seller has an incentive to sell goods of inferior quality, the so-called lemons.[79] Because buyers do not know the difference between high-quality and low-quality goods, they lower their offering price to the average

[69] Henrekson 2007, p. 6.; A third category does not use the business to add value, but to bypass regulation or obtain subsidies or tax credits. *Source: Henrekson 2007, p. 8.*
[70] Global Entrepreneurship Research Association 2018, p. 33.
[71] Henrekson 2007, p. 11-12.; This opportunity-based group will be the central theme in this thesis, without describing the other two groups.
[72] Mueller 2002.
[73] Berglöf 1994, p. 252.
[74] Bill & Melinda Gates Foundation 2018; Bloomberg 2017.
[75] Hall & Woodward 2007, p. 17.
[76] Hall & Woodward 2007, p. 19.
[77] Hall & Woodward 2007, p. 19.
[78] Akerlof 1970, p. 488, 493.
[79] Akerlof 1970, p. 488.

of the market. The height of the risk premium depends on the ease with which the contract can be enforced, and on personal knowledge about the character of the seller. [80] Solutions to the adverse selection problem and risk premiums are guarantees, brand names with a quality reputation, and certification or screening.[81] The problem of adverse selection may be more important for equity financiers, because they attract low-quality entrepreneurs; debt financiers will attract higher-quality entrepreneurs, because they know they can meet the periodic interest requirements.[82]

There is a double-sided problem of adverse selection in the relationship between the entrepreneur and the financier. On the one hand, the success of a startup depends on the abilities and dedication of the entrepreneur, but the financier does not know the entrepreneur's risk preferences and work/leisure preferences, and the value of the intangible assets.[83] There is also no prior history or reputation of the startup.[84] On the other hand, the investing financier may have more information about his potential to finance and advice than the innovating entrepreneur (leading to an information disadvantage for the entrepreneur), which may lead to a suboptimal low price paid for the equity stake in the enterprise.

2. Moral hazard

Moral hazard is the tendency to take excessive risks, because someone else bears the costs of the risks. Insurance creates incentives for selfish behaviour after the insurance contract is concluded. This increases the risk that the insured loss will occur.[85] The effort to reduce the risks decreases, also known as effort shirking. Moral hazard is a result of asymmetric information, because the effort of the first party is not observed by the second party. Solutions for moral hazard include monitoring (leading to more information for the uninformed party) and the offering of incentives (to align the goals of the agent with the principal).[86]

There is a double-sided moral hazard problem in the relationship between the entrepreneur and the financier. After the financing has been arranged, the entrepreneur may reduce his efforts or increase his expenses,[87] and the financier may also have an incentive to spend fewer consulting hours on the startup if he has a small stake.[88]

3. Related problems

Problems related with information asymmetry and moral hazard include the hold-up problem[89], free-riding[90], window-dressing[91].

[80] Akerlof 1970, p. 499
[81] Akerlof 1970, p. 500.
[82] Huyghebaert 2003, p. 26.
[83] Cumming 2005, p. 583.
[84] Huyghebaert & Van de Gucht 2007, p. 101, 105.
[85] Dembe & Boden 2000, p. 257-259.; Once someone is insured, the extra use of a good (medical care after bungee jumping) has a cost of zero for that person, because these extra costs are spread out over all insured persons, rather than borne by the individual. *Source: Pauly 1968, p. 533-534.*
[86] Nofsinger & Wang 2011, p. 2283.
[87] Huyghebaert 2003, p. 24.
[88] Houben 2002, p. 2.
[89] The hold-up problem occurs as a result of incomplete contracts: the first party is locked in because of transaction-specific sunk investments, and the second party with higher bargaining power exploits this by renegotiating the contract in his favor. This leads to underinvestment by the investor, because he has no guarantee on the profits. Williamson 1979, p. 239-240.
[90] The free-riding problem is the problem when someone benefits from goods or services, but does not pay for them, leading to an underprovision of those goods. Source: Baumol 1952.
[91] Window-dressing is the manipulation of interim performance, that is, a better impression of quality is given by the agent than the actual quality of the performance or product. Source: Cornelli & Yosha 2000, p. 1-2.

Other problems are trilateral bargaining[92], and risk shifting[93].[94]

In this paragraph the entrepreneur and his incentives were described. The vision and promises of this entrepreneur have to be backed by financing to be able to execute the vision. Depending on the viability and chance of success of the business plan, there are several financiers available, with their own risk preferences and incentives. These financiers will be discussed in the third paragraph.

[92] The trilateral bargaining problem is the situation in which two parties conclude a contract, and then a third party arrives and collaborates with one of the two initial parties at the expense of the remaining party. Source: Berglöf 1994, p. 248-249.

[93] Risk shifting is the tendency of equity holders to choose high-risk projects instead of low-risk projects, in order to transfer expected wealth from the debt-holders to the equity-holders. If the project fails, equity- and debt-holders both lose, but if the project succeeds, equity-holders get a high return, at the expense of debt-holders who preferred low-risk investments and a steady interest payment. Source: Huyghebaert & Van de Gucht 2007, p. 109.

[94] Cumming 2005, p. 579.

2.3 Incentives of financing parties

A starting firm needs a different type of funding than a mature firm. The startup first needs seed financing to develop the concept, then startup financing to develop the product and marketing, and finally first-stage financing to start the commercial manufacturing and sales.[95] There are several parties involved in the funding of these starting enterprises. Examples of sources of funding are bootstrapping, family and friends, angel investors, venture capital funds, government subsidies, trade credit, banks, and leasing. In line with the definition of a successful startup (see Paragraph 2.1.1), we focus in the following theoretic investigation on those financiers who can make the most important contribution in achieving the desired high growth and market value of the startup. Therefore the financing by bootstrapping and family and friends is excluded, because of the relatively small financial value. For the same reason, borrowing from a supplier (trade credit) and leasing are also excluded, because relying on these funds instead of bank funding may signal a startup with lower credit quality, and thus lower growth expectations.[96]

There are two types of financing: equity financing and debt financing. Equity financiers provide funding with the aim to acquire (partial) ownership in the company, and to share in the profit potential of the company. Angel investors and venture capitalists are classified under this group (par. 2.3.1 and 2.3.2). Debt financiers lend money to the enterprise, in return for interest on the debt and the obligatory repayment of the principal. Banks are classified under this group (par. 2.3.3). The funding by the government can be classified as debt financing or equity financing, depending on the type of government funding (par. 2.3.4).

Hereinafter, each party will be described, with their goals and strategies to achieve these goals while avoiding or mitigating the previously described agency problems, followed by a brief consideration of the advantages and disadvantages of the specific financier for the growth and market value of a successful startup. The paragraph is concluded by the factors that are considered important by that specific financier.

2.3.1 Angel investors

In this subparagraph the angel investor is described with the average investment amount, investment instruments and his goal. Furthermore, problems caused by information asymmetry and moral hazard are solved, the advantages and disadvantages of an investment by the angel for the startup, as well as factors considered important by angel investors in the decision to invest.

Description

An angel investor[97] is "a wealthy[98] person who invests a large amount of money in a new high-risk business"[99]. This is preferably a company with high potential for capital gains in the next five to ten years,

[95] OECD 1997, p. 9.
[96] Huyghebaert 2003, p. 34.
[97] Other terms for angel investors include business angel, informal investor, private investor, and seed investor. A celestial angel is a passive angel investor, and a guardian angel is an active, long-term angel investor. (Source: Thompson n.d., p. 2.) In the remainder of this thesis, when the angel investor is mentioned, the active guardian angel is meant.
[98] The definition of "wealthy" is broad, but there may be explicit requirements related to the investor's net worth or income, to protect the investing public against themselves. For example, to be an accredited investor in the US, a $200,000 net income per year or a $1,000,000 net worth is needed. *See* Paragraph 230.501 of Regulation D, U.S. Securities Act of 1933.
[99] Merriam-Webster Dictionary 2018.

in an industry in which the investor has experience.[100] Variations on the "normal" angel investor are the super angel[101] and angel group.[102] Angels typically invest in clusters.[103]

Angel investors provide financing to fill the gap between the funding of friends and family and the later funding of venture capitalists. They generally fund at the seed stage, start-up stage, and early-growth stage, but are also increasingly financing the expansion stage.[104] Because angels invest less money per company, they can invest in a larger number of companies. For example, in Canada the average investment of Canadian angel groups was $125,000 (median) and $376,000 (average) per company, with an average of 12 investments per angel group in 2016.[105] The angel groups often invest as part of a larger syndicate, with other angel investors, venture capital funds, government; the total amount invested is two to four times the amount invested by the angel group.[106] The average deal sizes are shown in **Figure 2**; the largest investments are done together with venture capital funds.

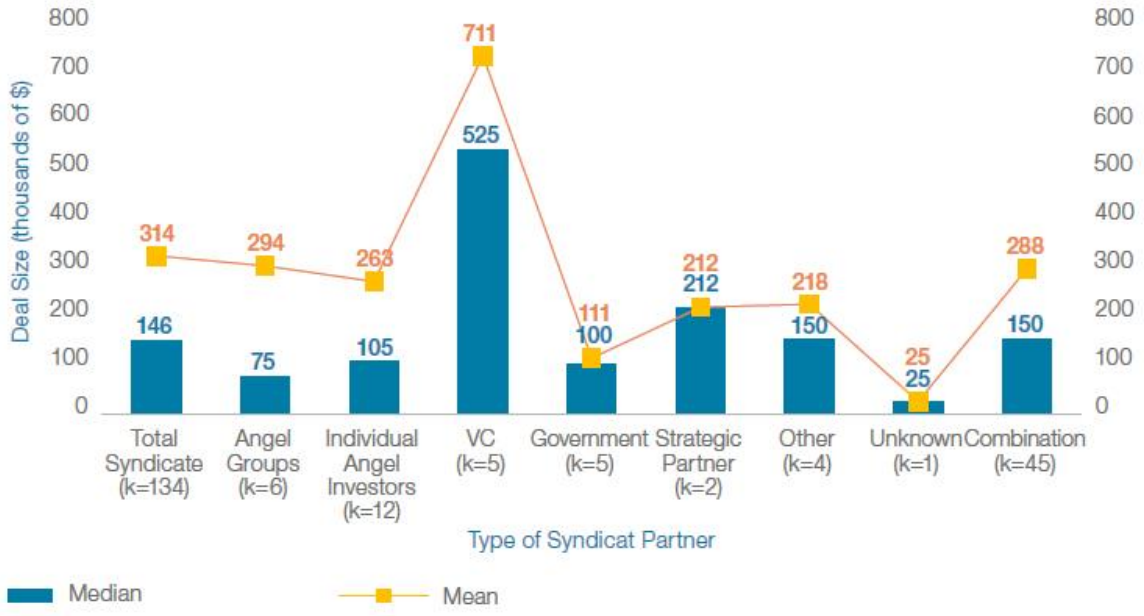


Figure 2: Investments of business angels with syndicate partners. Source: NACO 2016, p. 31.

[100] Ehrlich et al. 1994, p. 69; Leshchinskii 2002, p. 3.
[101] A super angel is a "hybrid between an angel investor and a venture capitalist", meaning that more money is invested than an angel investor would normally do, but the experience and advice of the angel investor is retained.
[102] An angel group or angel network is "a group of wealthy investors who pool their resources to invest in new businesses", leading to more available investment capital (Source: Merriam-Webster Dictionary 2018).
[103] Freear, Sohl & Wetzel 2002, p. 282.
[104] NACO 2016, p. 3, 10.
[105] NACO 2016, p. 12.
[106] NACO 2016, p. 28-29.

In **Figure 3** the use of investment instruments of Canadian angels is shown (Canada is comparable with the Netherlands)[107]. The three main instruments are common shares, preferred shares, and convertible debentures.[108] The use of common shares is decreasing, while the use of convertible debentures is increasing.

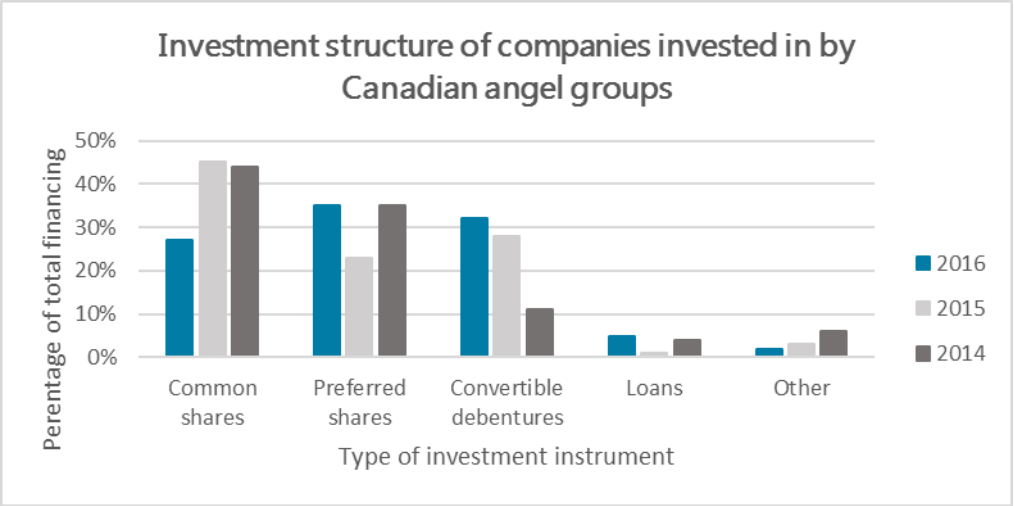


Figure 3: Overview of the reported deal structure of companies invested in by Canadian angel groups. Source: NACO 2016, p. 33; NACO 2015, p. 38; NACO 2014, p. 36.

The average investment of American angels is comparable with the investment by Canadian angels. The average investment in American startups was $347,000 in 2015, with an average participation in the company of 15%, and a valuation of $2.3 million.[109] The American angels have a preference for preferred stocks and convertible debt.[110] The American angels want a board seat for significant investments.[111]

Goal

The goal of the angel investor is twofold: the financial goal of getting a return on the invested capital, and the personal goal of helping the entrepreneur. This non-financial goal can be the result of a personal connection with the entrepreneur, a strong belief in the usefulness of the product or service, the

[107] Canada is comparable with the Netherlands in terms of size of the economy (GDP in 2017 of 1,652 billion versus 826 billion dollars) and wealth of the population (Purchasing power parity in 2017 $48,141 versus $53,582).[107] This comparability means that the angel groups in the Netherlands may also structure their financing in the same way as the Canadian angel groups do.

[108] A short description of normal equity, preferred equity, convertible equity, convertible preferred equity, and convertible debt:
With normal equity, there is an unlimited upside and a limited downside. The advantage of preferred equity is that there is more downside protection, because of the preference you get paid earlier than the dividends on the common equity, but the disadvantage is that the upside is limited because of the fixed dividends.
Convertible equity is comparable with convertible debt. One form is the Keep It Simple Security, which has features of the convertible note: the note is converted into equity when financing is raised (generally in the A round), but if no financing is raised, the note plus interest has to be repaid. Convertible preferred equity gives the option of preferred dividend and preferred liquidation rights if the investor does not convert, and the right on dividends if the investor does convert. Convertible preferred equity is similar to preferred equity with warrants. Participating convertible preferred equity is similar to convertible preferred equity, but with an additional right to participate in the profits of the firm. *Source: Koss 2007, p. 3; Davie 2017; Hellmann 2006, p. 650; Chemmanur & Chen 2006, p. 32.*
Another investment instrument is venture debt, a hybrid between venture capital and debt. Important factors for financiers to provide venture debt are getting patents as collateral, getting warrants, and venture capitalists backing the startup. De Rassenfosse & Fischer 2016, p. 236.

[109] University of New Hampshire 2016.

[110] Angel Capital Association 2016, p. 9, 23.

[111] Angel Capital Association 2016, p. 23.

excitement of being involved in the early growth of a new business, or the general desire to help new startups or create jobs.[112]

To achieve the financial goal, the investor wants an equity position in the startup.[113] The general aim is to take 20 to 50 percent ownership.[114] Although very little research has been done into the financial return of angel investors, it is estimated that the average return based on U.S. exits was 27% per year (without taking into account the opportunity costs of invested time).[115] However, this average is skewed by the large exits. When the exits are analysed, 52% of the investments return less capital than invested, 35% return 1-5 times the capital invested, 6% return 5-10 times the capital invested, and the remaining startups return more than 10 times the capital invested.[116] Seven percent of the exits accounted for 75% of all the investment returns;[117] the other ninety-three percent of the angel investors have to share the remaining 25% of the investment returns.

Several factors lead to a higher exit: spending more time on due diligence (median of 20 hours), industry expertise (average of 14 years), and interaction with the startup by means of coaching and financial monitoring (a couple times per month).[118] Follow-on investments from the same investor led to a lower exit, and involvement of venture capital led to more extreme outcomes, i.e. more failures and larger exits.[119]

With regard to the non-financial goal of helping the entrepreneur, the angel investor wants a long-term management role in the startup, to be able to add value.[120] This can be achieved by a formal board position, or, more often, an advisory position.[121]

Relationship with the entrepreneur

The goals of the angel investor are not necessarily the goals of the entrepreneur. As described in Paragraph 2.2, there are three main problems: adverse selection, moral hazard, and information asymmetry

An important advantage of angel investors is the more informal relationship with the entrepreneur. Because of stronger social ties and a mutual-trust relationship, the moral hazard problems are reduced, and the entrepreneur and angel investor increase their efforts.[122] This "empathy" mainly exists because of geographical closeness and psychological closeness, and this means that the utility curve of the entrepreneur changes: instead of only caring about himself, he also cares about the payoff of the angel investor.[123] The adverse selection problem can also be solved by the trust relationship: when the social ties are stronger, the entrepreneur will do his best to fulfil his given promises.

---

[112] Thompson n.d., p. 2; Freear, Sohl & Wetzel 2002, p. 280.
[113] Thompson n.d., p. 3-4.
[114] Koss 2007, p. 1.
[115] Between 1990-2007, with an average exit of 2.6 times the investment after 3.5 years. Wiltbank & Boeker 2007, p. 1.
[116] Wiltbank & Boeker 2007, p. 3.
[117] Wiltbank & Boeker 2007, p. 1.
[118] Wiltbank & Boeker 2007, p. 5-7.
[119] Wiltbank & Boeker 2007, p. 8-9.; Older research in the United Kingdom found that 34% lost all invested capital, 13% had a return of zero on the capital, 23% had a return of more than 50%, and 10% had a return of more than 100%. Mason & Harrison 1999, p. 222-224.
[120] Thompson n.d., p. 3.
[121] Thompson n.d., p. 3.
[122] Fairchild 2011, p. 361.
[123] Fairchild 2011, p. 364.

Because the entrepreneur keeps the majority of the equity, i.e. 70-80%, the incentives of the entrepreneur (making profit) are more aligned with the incentives of the angel investor.[124] Besides, the use of equity instead of convertible debt also increases trust, because the entrepreneur and the investor are on the same team in case of bankruptcy.[125] Another way to reduce risks is syndication (investing with more angels means a lower amount invested per investor and more monitoring) and geographical proximity (local ties).[126]

Concluding, angel investors mitigate risks by relying on trust, by means of geographical proximity and equity investment. There are almost no board positions or staged financing used, or contractual design or anti-dilution clauses.[127]

Advantages for the startup

I conclude that the advantages for the startup of being financed by an angel investor, are the following, based on the abovementioned literature: The intangible advantages of being financed by an angel investor include the mentoring, management experience, and important connections and introductions in the industry.[128] The tangible advantages is the funding. Other advantages for the entrepreneur include less term sheet provisions, less often the right for the investors to force bankruptcy, and less often a board seat for the angel investor compared to the venture capitalist.[129]

Theoretically the performance of business angels is better because venture capital fund managers have to invest under time pressure. This may lead to suboptimal investments; business angels give more support and time to startups. They will encounter less adverse selection because their terms are less strict (i.e. the good entrepreneurs will stay on the market instead of leaving the market).[130] And trust – being a characteristic of the relationship with the entrepreneur – has a positive and significant effect on success (measured by the IRR).[131]

On the other hand, it can be theoretically substantiated that the performance of business angels is worse compared to venture capitalists. Angel investors have less experience (less investments), they do not decide on purely economic considerations because they are investing their own money instead of other people's money, and they have less money to invest in follow-up rounds.[132]

Empirically, the jury is still out on the question whether angel investors are actually adding value to startups The population of business angels is a heterogenous group, mostly consisting of unsophisticated investors who may be unable to add value.[133] Investments done solely by business angels have a lower proportion of high-performance investments than investments done with venture capital funds or banks.[134] This signals an inability to systematically add value to startups.

However, Kerr et al. compare U.S. firms funded by angel investors with firms not funded by angel investors, and show that the funded firms are 27% more likely to survive in the first four years, with an

[124] Wong 2002, p. 22.
[125] Cumming 2005, p. 610-611.
[126] Wong 2002, p. 23, 25.
[127] Wong 2002, p. 3, 4.
[128] Thompson n.d., p. 2; Wong 2002, p. 26.
[129] Shane 2008, p. 31-32.
[130] Mason & Harrison 1999, p. 221-222.
[131] Duffner, Schmid & Zimmermann 2008, p. 13.
[132] Mason & Harrison 1999, p. 219-220.
[133] Prowse 1998, p. 791.
[134] Mason & Harrison 1999, p. 231.

average extra growth of 20-39 percent.[135] This is confirmed by the research of Mason & Harrison, who showed that British business angels slightly less often realized exceptional gains from their investments, but avoided more bad investments (see **Table 2**).[136]

Table 2: Comparison of the returns of venture capital funds and business angels in the United Kingdom.

Effective return on investment	Venture capital funds	Business angels
Negative	64.2	39.8
0-24%	7.1	23.8
25-49%	7.1	12.7
50-99%	9.5	13.3
>100%	12.0	10.2

Source: Mason & Harrison 2002, p. 224; Murray 1999, p. 361.[137]

Concluding, the amount invested by angel investors is relatively low compared with venture capitalists, which may make this financing unattractive for a high-growth startup that requires an investment of more than $1 million. However, because of the trust relationship between the entrepreneur and angel investor (being the main characters in the startup), both will put in more effort than with venture capital financing, ensuring an additional intrinsic motivation. Associated with this trust-relationship is the long-term attitude: angel investors do not liquidate as fast as venture capitalists, and have a higher positive rate of return for the moderately performing groups. The angel investor is therefore a suitable investor for a high-growth startup, preferably part of a larger whole of other angel investors and venture capital funds.

Factors

There are several requirements considered important by angel investors, according to the abovementioned literature. The entrepreneur should (try to) comply with these requirements to obtain this angel investment:

- Angel investments are largely local (city or province), although times are changing and the geographical reach is increasing.[138]
- Angel investors have an investment funnel: first, there is an assessment of the application on its suitability for specifically these investors, second, there is a presentation for the investors, and finally, when the investors are interested, the due diligence.[139]
- They invest in corporations, rather than sole proprietorships or partnerships.[140]
- They fund companies that need between $100,000 and $2,000,000,[141] and the startup should have sales of at least $10 million in five years.[142]

[135] Kerr, Lerner & Schoar 2010, p. 5, 20.
[136] Mason & Harrison 1999, p. 223-224.
[137] Note that the data used in this empirical research may be outdated, since the study is from 2002, and note that the failure rates of business angels in the United States are as high as 60-70%. *See:* Benjamin, G.A. & Margulis, J.B., *Angel Capital: How to Raise Early-Stage Private Equity Financing*, Hoboken NJ: Wiley 2013, p. 219-220.
[138] NACO 2016, p. 41.
[139] NACO 2016, p. 42-43.
[140] Shane 2008, p. 26.
[141] Freear, Sohl & Wetzel 2002, p. 278.
[142] Shane 2008, p. 26.

- They invest in two thirds of the cases in cashflow-positive businesses, and only one third of the cases in the pre-revenue businesses.[143]
- The characteristics of the entrepreneur: white (90% of the cases) and male (91% of the cases), a college education (58% of the cases), started another business (60%), and more than ten years of working experience (51%).[144]
- The influenceable factors for trust include the perceived quality of the entrepreneurial team, and the provision of information (communication).[145]
- High-growth firms, measured by the market-to-book ratio, receive more funding.[146]
- The sector invested in may be important: although good investment opportunities are not restricted to the technology sector,[147] angels may have a preference for high-tech products.[148]
- A sound and committed management team, and an added value in the business.[149]
- A new product is positively interpreted, i.e. innovation.[150]
- Prior entrepreneurial experience is less relevant, because the investor knows about the skills and character of the entrepreneur.[151]

There are also requirements that are important for the growth of the startup, so the startup should pursue these:

- The largest deals involve venture capital,[152] so the combination of a business angel with a venture capital fund is preferred if more money is needed;
- A serial angel is preferred, because of the better connection of serial angels with the VC;[153]
- Companies financed with equity may signal a higher level of trust.[154]

[143] Shane 2008, p. 40-41.
[144] Shane 2008, p. 42-43.
[145] Duffner, Schmid & Zimmermann 2008, p. 13.
[146] Wong 2002, p. 22.
[147] Mason & Harrison 1999, p. 228.
[148] Wetzel 1983, p. 27.
[149] Wetzel 1983, p. 28.
[150] Nofsinger & Wang 2011, p. 2283.
[151] Nofsinger & Wang 2011, p. 2283.
[152] NACO 2016, p. 30.
[153] Hellmann, Schure & Vo 2017, p. 4.
[154] Duffner, Schmid & Zimmermann 2008, p. 14.

2.3.2 Venture capitalists

In this subparagraph the venture capitalist is described with the average investment amount, his goal, how problems with the entrepreneur are solved, the advantages for the startup of an investment by the VC, and factors considered important by venture capitalists.

Description

Venture capital is "money available for investment in startup companies and small businesses with a high potential for growth", also called risk capital.[155] Venture capitalists invest other people's money,[156] using a specific structure.[157]

For venture capitalists, the country and the economic conjuncture is important. Venture capitalists prosper in countries with a well-developed stock market that provides an exit through IPO, a flexible labour market, a large private pension sector, and low capital gains taxation.[158] Venture capital firms also invest more in early-stage firms in good economic times, when more capital is flowing into the market.[159] An economic downturn in the real economy leads to less investments in the early-stage firms (VCs have to refinance the later-stage companies), but a downturn in the financial economy leads to more investments in these early-stage (temporarily less capital, so early-stage companies can be valued at a discount, making them more attractive).[160]

Another characteristic of venture capital financing is syndication, meaning that several VCs finance together, with one lead investor. Advantages of syndication are more screening ability, more expertise, shared risks, more diversification for VCs, and a certification effect.[161] The syndication rates in Europe and the United Kingdom are falling, and on average 20-30%, while the syndication rate in the United States is increasing, and approximately 50%.[162]

The average investment by venture capitalists in a U.S. company was $13.6 million in 2015, with an average company pre-money valuation of $5.1 million.[163] Venture capitalists typically invest in the growth stage instead of the startup phase, but times are changing; they are increasingly investing in the startup stage. VCs that are active in the "angel stage" perform better than non-active VCs.[164] And a startup is significantly more likely to obtain VC financing in the first two years of existence, compared with any later year.[165] The participation in the company varies. According to Kaplan & Stromberg, the U.S. VC has on average 40-53% of the cashflow rights, and 46-59% of the voting rights in the first round of VC capital.[166] The three major exit routes to "get the money out" of the company, i.e. to secure the

[155] The American Heritage Dictionary of the English Language 2018.
[156] Leshchinskii 2002, p. 3.
[157] The general structure is as follows: the venture capital fund is the pooled investment vehicle (often a limited partnership) that invests the capital of third parties, and this VC fund invests in several portfolio companies. The General Partners of the venture capital fund is the venture capital firm with the managers (they make the investment decisions), and the Limited Partners are the investing third parties. Most venture capital funds have a fixed life of ten years, so after ten years the capital is returned to the investors. The venture capital fund managers are compensated through management fees and carried interest, respectively 2% of the invested capital and 20% of the profits of the fund. Source: Bloomberg 2018.
[158] Bertoni, Colombo & Grilli 2011, p. 1030. However, note that an increase in the capital gain tax rate may lead to greater incentives for venture capitalists to provide value-enhancing services. *See* for an overview of the effects of tax measures Keuschnigg, C., & Nielsen, S.B., 'Tax Policy, Venture Capital, and Entrepreneurship', *Working Paper National Bureau of Economic Research* October 2000.
[159] Paik & Woo 2014, p. 115-116.
[160] Paik & Woo 2014, p. 117-118.
[161] Schwienbacher 2005, p. 15.
[162] Wright & Lockett 2003, p. 2075.
[163] Angel Capital Association 2016, p. 9.
[164] Park & Vermeulen 2015, p. 10-11.
[165] Bertoni, Colombo & Grilli 2011, p. 1032.
[166] Kaplan & Strömberg 2002, p. 7-8.

return on the invested capital, are an IPO (for the most promising startup), a trade sale (general option), or liquidation.[167]

Not all venture capital funds are the same. Venture capital funds constitute a heterogenous group, and some funds are more successful than others.[168] This depends on their ability to add value to the startup:

- The human capital to provide high-quality services to the portfolio firm (the startup);[169]
- The investment motives, and therefore the time and effort invested in the portfolio firm;[170]
- The types of portfolio firms they invest in (more value added to early-stage firms);[171]
- The type of the VC: independent partnerships are adding more value and are therefore preferred, because they have less restrictions for their investments than VCs affiliated with a financial institution or government, and have stronger incentives to maximize returns.[172] These VCs are also more active compared with their affiliated counterparts.[173] Luukkonen et al. show for the independent European VCs vis-à-vis the governmental VCs that significant extra value is added through the professionalization of the board, and the exit orientation.[174] Although the other value-adding categories of strategy, R&D, credibility, internationalization, and follow-on financing are not significant, the independent VCs score systematically higher than the government VC.[175]
- The historic investment experience, success rate and information network are also indicators for the ability of adding value. Because of this better reputation of the VC, the VC can get a discount on the valuation (price) of the startup.[176] The extra experience and lower valuation balance each other out, so the *entrepreneur* values both VCs the same;[177] however, for the high-growth *startup* the experience of the VC is more important than a (temporary) lower valuation.

In **Figure 4** the use of various investment instruments by Canadian VCs is shown, for investments in startup companies. The data show that instead of mainly using convertible preferred equity, a variety of securities is used.[178] They are more likely to finance with common or convertible preferred equity, and less likely with debt.[179]

[167] Schwienbacher 2005, p. 3, 32.
[168] Luukkonen, Deschryvere & Bertoni 2013, p. 154.
[169] Luukkonen, Deschryvere & Bertoni 2013, p. 154.
[170] Luukkonen, Deschryvere & Bertoni 2013, p. 154.
[171] Luukkonen, Deschryvere & Bertoni 2013, p. 154.
[172] Bengtsson & Wang 2010, p. 1368; Cumming 2005, p. 588.
[173] Schwienbacher 2005, p. 17.
[174] Luukkonen, Deschryvere & Bertoni 2013, p. 157-158.
[175] Luukkonen, Deschryvere & Bertoni 2013, p. 158.
[176] Hsu 2004, p. 1834.
[177] Bengtsson & Wang 2010, p. 1368.
[178] Cumming 2005, p. 593.
[179] Cumming 2005, p. 608.

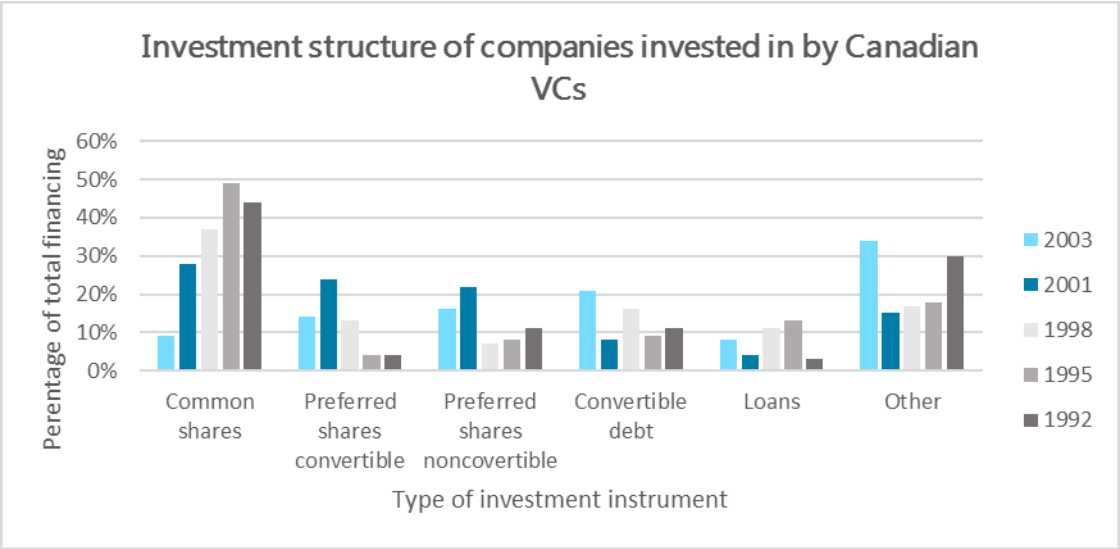


Figure 4: Overview of the reported deal structure of startups invested in by Canadian VCs in the period 1992-2003. Source: Cumming 2005, p. 593.

The investment instruments in the United States differ from the instruments used in Canada. In the United States the convertible preferred equity is widely used for companies (80% of the cases), as well as a combination of convertible preferred equity and common equity (8% of the cases); note that these data include companies in all lifecycle stages, and may be outdated.[180] Less convertible securities are used by young VCs, or in deteriorating economic times when VCs compete for investment opportunities; in those cases more common equity is used.[181] In the startup phase more preferred equity and common equity are used.[182] For the first financing round less debt is used compared with later rounds, and for high-tech investments it is more likely that convertible preferred equity and convertible debt are used.[183] The subject of why convertible securities are widely used, will be discussed in the section about moral hazard problems.

The investment instruments used in Europe differ from those in the United States. In Europe the convertible securities are used far less often compared with the United States: in 20% of the cases versus 59% of the cases.[184] This difference can be explained by learning effects (the U.S. market is more evolved in contract sophistication than the European market), the tax advantages in the United States by using these convertibles, and the standardized agreements in which these convertible securities are included.[185] The European venture capitalists use less syndication, replace the entrepreneur less often, and have longer round durations.[186] This can be explained by the fact that the markets (key employees and exits) are less liquid in Europe compared with the United States.[187]

[180] Kaplan & Strömberg 2002, p. 4, 6.
[181] Schwienbacher 2005, p. 14-15.
[182] Cumming 2005, p. 585, 606.
[183] Cumming 2005, p. 608.
[184] Schwienbacher 2005, p. 31.
[185] Schwienbacher 2005, p. 13.
[186] Schwienbacher 2005, p. 17.
[187] Schwienbacher 2005, p. 2.

Goal

The goal of VCs is purely financial: getting the highest return on investment, in a relatively short time period of three to five years. Government VCs have profit maximalization as their main goal, with job creation as a subordinate goal.[188] Compared with the angel investors, venture capital funds have more extreme exits: they have slightly more exceptional exits with an IRR of more than a hundred percent, but also far more exits with a negative rate of return (i.e. losing the invested capital).[189] The average return of venture capitalists is higher than the return of angel investors (see **Table 2**).[190]

There are several estimates of the realized average IRR: the British early stage fund had a return of 22.9% per year for three years, while the U.S. early stage/ seed fund had 48.9% per year for three years.[191] Another estimate for the United States with data from before 1999 is 31% per year for four years.[192] The venture capitalists use high discount rates (and need higher returns on their investments) because not all of the companies they invested in will succeed; the winners have to win big to compensate for the losers.[193]

The venture capitalist's return is much higher than the market return, and this higher return has to compensate for the additional risk (the VC's returns are more volatile compared to the market return), see **Figure 5.** The riskiness of the returns on the startup investments may be underestimated because the figure captures all the venture capital investments instead of only the riskier startup investments.[194]

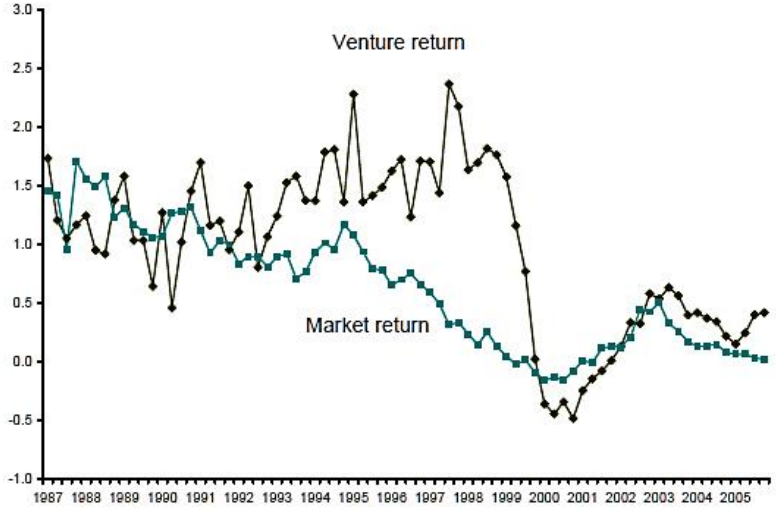


Figure 5: The returns for venture capitalists compared with the returns for the general stock market, for the years 1987 – 2005. Source: Hall & Woodward 2007, p. 23.

[188] Cumming 2005, p. 587.
[189] Murray 1999, p. 361.
[190] Leshchinskii 2002, p. 21.
[191] Murray 1999, p. 358-359.
[192] Kaplan & Strömberg 2002, p. 11.
[193] Bhagat 2014, p. 98.; The internal rate of return should be 30-50%, so when failures are offset the portfolio return is 20-30%. OECD 1997, p. 18.
[194] Hall & Woodward 2007, p. 23, 24.

Relationship with the entrepreneur

The goals of the venture capitalist may clash with the goals of the entrepreneur. The venture capitalists uses several mechanisms to achieve his financial goal, namely a safe and high return on his investments. The main mechanism of the venture capitalists is control, laid down in contractual control rights. The venture capitalists get more control when things go badly with the company, and less when things go well with the company.[195] This control manifests itself in different mechanisms, depending on the specific agency problem:

1. Syndication and screening

With syndication a group of investors invest together, so the screening ability increases.[196] In the screening, several important elements are evaluated, like the entrepreneur, the product, the market, and the financial data.[197] Screening limits the adverse selection, because lemons are discovered in the screening, and investors do not invest in these startups.[198]

2. Choice of securities

Each investment instrument has its own advantages and disadvantages. VCs prefer preferred equity because of the additional rights of this preferred equity compared to common equity, like liquidation rights, veto rights and board position.[199] Through the use of these securities, the problems associated with equity (no repayment obligation) and debt (no upside) are evaded. Convertible securities are often used to mitigate the double moral hazard problem, so the entrepreneur and the venture capitalists give their best efforts.[200]

A moral hazard problem also arises when the investment by one of the parties is low. Because the investment is low, the payoff will also be low; the solution is to give that party securities with a high upside potential, so there is more incentive to exert effort. So when the VC has a low investment, common equity is recommended (with preferred equity for the entrepreneur), and when the VC has a high investment, convertible bonds or preferred equity for the VC is recommended (with equity for the entrepreneur), so the entrepreneur becomes more incentivized.[201] Angel investors typically use equity (because they have a small share), while VCs use convertible bonds or preferred equity, because their stake is larger than the entrepreneur's stake.[202]

Although convertible preferred equity incentivizes the entrepreneur and the VC, there may be additional agency problems when there is a syndicate of VC investors. When there is an information asymmetry between the first and later investors, the 'normal' preferred equity is used, i.e. a fixed-fraction contract so each investor receives a payoff proportional to his initial capital investment.[203]

---

[195] Kaplan & Strömberg 2002, p. 11, 15.
[196] Cumming 2005, p. 585.
[197] Vinig & De Haan 2002, p. 2.
[198] Huyghebaert & Van de Gucht 2007, p. 108
[199] Taulli 2012, p. 59.
[200] At the moment of deciding whether to invest or not, the effort of the entrepreneur and venture capitalist is unknown, as is the likelihood that the product will be successful. In the bad situation and medium situation, the venture capitalist wants his fixed payment (debt paid back), but in the good situation he also wants to have part of the upside potential (conversion into equity). Because the firm is worth more with the VC's investment, the entrepreneur will be incentivized to give his best efforts. In the good situation (only achievable by the optimal efforts of both the entrepreneur and the VC), the VC decides to convert in equity, i.e. conditional on the efforts of the entrepreneur. Convertibles also mitigate the window-dressing problem and the trilateral bargaining problem. Source: Schmidt 2001, p. 7, 12, 15, 26.
[201] Casamatta 2003, p. 2061.
[202] Casamatta 2003, p. 2061.
[203] Cumming 2005, p. 584.

3. Staged financing

Staged financing means that the initial investment is limited, and only when the prearranged milestones are achieved, the next financing round starts. This reduces moral hazard, because the VC can monitor the entrepreneur's performance in reaching the milestones: this leads to a continuous pressure on the entrepreneur to perform and comply with the contract.[204] Staged financing gives the VC more options to abandon the company.[205] In some cases, up-front funding with monitoring may be better than staged funding without monitoring: when the effort of the entrepreneur is costly (more monitoring is needed for his effort) and the monitoring costs are low, up-front funding is preferred.[206]

Staged funding can reduce the problems of information asymmetry, because venture capitalists get information about whether the milestones are achieved.[207]

4. Contractual provisions

Contractual provisions are used to protect and empower the venture capitalist investor.[208] There are several provisions used, including provisions about cashflow rights, voting rights, board rights, liquidation rights, anti-dilution rights, vesting and non-competing requirements, and contingencies on financial and non-financial performance.[209] This may include that the VC will obtain all voting control when the EBIT or the net worth of the company falls below a certain threshold; in that case the entrepreneur has lost all his voting power.[210] When the management can be replaced, the entrepreneur has an incentive to stop shirking.[211] However, if the startup is successful an IPO is more likely; the VCs will exit through the IPO, and return the control to the entrepreneur, which forms an incentive for the entrepreneur to perform well.[212]

The hold-up problem is mitigated by the inclusion of non-compete and vesting provisions in the contract: if the entrepreneur exits the startup, he loses the unvested part of his participation in the startup, and he is also not allowed to start a similar startup.[213] Therefore unvested shares, options and warrants are used, to motivate the entrepreneur to not leave the company.[214]

5. Monitoring

Monitoring gives valuable information to the investor about the viability of the startup. This monitoring includes frequent meetings with the startup team, and being involved in the strategies, and hiring decisions.[215] Monitoring gives more information about the effort of the entrepreneur, thereby mitigating the moral hazard problem. It becomes possible for the investor to give more advice about previously unknown issues, and he can influence the course of the startup and preventing certain exit routes.[216]

[204] Huyghebaert 2003, p. 27.
[205] Schwienbacher 2005, p. 5.
[206] Cherif & Elouaer n.d., p. 7.
[207] Cherif & Elouaer n.d., p. 2.
[208] Wong 2002, p. 19-20.
[209] Kaplan & Strömberg 2002, p. 7-15.
[210] Kaplan & Strömberg 2002, p. 12, 14.
[211] Schwienbacher 2005, p. 8.
[212] Gilson & Black 1997, p. 20-24.
[213] Kaplan & Strömberg 2002, p. 15.
[214] Bengtsson 2011, p. 1930.
[215] Cherif & Elouaer n.d., p. 5.
[216] Schwienbacher 2005, p. 6-7.

6. Board position

Having a board position may lead to a better monitoring, and acquiring more information.[217] The venture capitalist gets the possibility to affect strategical decisions of the startup.[218] However, there is a fiduciary duty for board members to not favour one class of shareholders at the expense of another class, so the possibilities with having a board position are not limitless.[219]

The U.S. VC has on average 37% of the board seats, the founder has 39%, and others have 24% of the board seats.[220] In normal times the VC has a board majority in 12% of the companies with first VC round (the founder in 20% of the cases, and neither party in 68%), but in adverse times this changes to 27% (the founder in 17%).[221] The same applies to the contingent voting rights: the VC has a voting majority in 41% of the companies, which increases to 61% if management performance is bad.[222] So the venture capitalist gets more control when the entrepreneur can't deliver his promises.

Concluding, venture capitalists mitigate risks by relying on control mechanisms, such as convertible securities, staged financing, strict contractual provisions for non-performance of the entrepreneur, and comprehensive information obtained through monitoring and board positions.

Advantages for the startup

I conclude that the advantages for the startup of being financed by a venture capitalist, are the following, based on the abovementioned literature: The most important advantage for the startup of being financed by a venture capitalists is the positive effect of venture capitalists' funding on the growth and value of the startup. Theoretically, venture capitalists are under continuous pressure to add value to the startup, so the startup will be able to achieve the desired return on the invested capital. Venture capital funding fulfils the signalling function of determining good startups,[223] and venture capital funds act as certification agents for other stakeholders.[224] Because the quality of the startup is unknown, third parties rely on the affiliates of the startup, and the venture capitalists are a good certificate for the quality.[225]

Apart from the provided money by the VC, there is also intangible value added. This includes coaching, management experience and strategic advice, and several other professional services such as accounting, marketing, corporate governance, recruiting key personnel, and negotiation with suppliers.[226] Venture capitalists require more reports from the entrepreneur in comparison with angel investors, but also supply more feedback, and entrepreneurs have more opportunities to access follow-up capital.[227]

On the other hand, there are certain disadvantages of being financed by VCs. The most important disadvantages are the loss of control, which can even amount to the total loss of the startup and the liquidation of the startup if certain performance targets are not met.[228] The short-term vision of venture

[217] Schwienbacher 2005, p. 6.
[218] Wong 2002, p. 15.
[219] Bengtsson 2011, p. 1934.
[220] Kaplan & Strömberg 2002, p. 8.
[221] Kaplan & Strömberg 2002, p. 8.
[222] Kaplan & Strömberg, 2002, p. 8, 10.
[223] Shane 2009, p. 142; Bertoni, Colombo & Grilli 2011, p. 1028.
[224] De Rassenfosse & Fischer 2016, p. 250.
[225] Hsu 2004, p. 1805-1806.
[226] Schmidt 2001, p. 1; Bertoni, Colombo & Grilli 2011, p. 1039; Casamatta 2003, p. 2059; Luukkonen, Deschryvere & Bertoni 2013, p. 154.
[227] Ehrlich et al. 1994, p. 80.
[228] Kaplan & Strömberg 2002, p. 12, 14.

capital fund managers in profitably returning their capital may have a harmful effect on the long-term growth of the startup.

Empirically, it is shown that venture capitalists do add value. According to the OECD, the VCs have a positive effect on economic growth and job creation.[229] This is confirmed by Puri & Zarutskie, who show that the growth in employment and sales of the VC-financed startup is higher compared with a non-VC-financed startup, but also that the VC-financed startup is less profitable.[230] This high growth rate levels off in later years, but the sales and employees of VC-backed firms in absolute numbers are still higher than the non-VC-backed startup.[231]

In measuring the effect of the VC investment on the growth of the startup, a difference has to be made between the selection effect (VCs picking the best startups, so even without the VC' support the startup would have become successful) and the treatment effect (the effect of VC investment on the firm's growth), with both effects being present.[232] Bertoni et al. shows in his research about Italian startups a positive treatment effect of approximately 40% additional growth, with growth being measured in sales and employees.[233] Most of the treatment effect is obtained in the first year after obtaining the VC funding.[234]

It also seems that syndication has a positive effect on the growth of the startup. The syndicate can select better deals and add more value; however, there is also the possibility for VC firms to keep the better deals for themselves and only syndicate the uncertain and risky deals.[235] It is therefore crucial to find a suitable syndication partner to prevent internal agency problems. It is empirically shown that syndicated venture capitalist investments are more successful than non-syndicated venture capital investments.[236]

Concluding, the venture capitalist is a good financier because of his proven value-adding properties. Although the venture capitalist financier can add significant value and jumpstart the startup in terms of sales and growth, the entrepreneur should carefully assess the experience and values of the venture capitalist, as well as negotiating the terms of the contract. The prearranged contractual performance milestones should be in line with the long-term growth of the startup, instead of focusing on the short-term sales or profit.

Factors

There are several requirements considered important by venture capitalists, according to the literature. The entrepreneur should (try to) comply with these requirements to obtain this type of funding:

- The profitability, as measured by the internal rate of return of the investment in the startup, with a relatively short payback time of the investment; [237]
- Having a high growth rate;[238]
- The strategic position of the firm in the market and in relation to the competition;[239]

[229] OECD 1997, p. 2.
[230] Puri & Zarutskie 2008, p. 18.
[231] Puri & Zarutskie 2008, p. 19.
[232] Baum & Silverman 2004, p. 430.
[233] Bertoni, Colombo & Grilli 2011, p. 1035.
[234] Bertoni, Colombo & Grilli 2011, p. 1037.
[235] Duffner, Schmid & Zimmermann 2008, p. 16.
[236] Siddiqui, Marinova & Hossain 2016, p. 76, 82.
[237] Minola & Giorgino 2008, p. 348; De Rassenfosse & Fischer 2016, p. 237, 244.
[238] Minola & Giorgino 2008, p. 348.
[239] De Rassenfosse & Fischer 2016, p. 237, 244.

- The quality of the entrepreneur and the team [240];
- Previous entrepreneurial experience, as a signal of competence (experience as a substitute for social ties),[241] but not when these were entrepreneurial failures;[242]
- Education of the founders;[243]
- Social ties with venture capital firms[244]
- The signalling effect of patents, and more specifically, recent patents (intellectual capital);[245]
- An existing product;[246]
- Using convertible preferred equity or preferred equity;
- First two years of the startup, because obtaining venture capital is most likely in the first two years;[247]
- Having downstream alliances, signalling access to production facilities and being closer to commercialization of the product;[248]
- The Internet and telecommunications industry startups are more likely to receive an investment compared with other industries,[249] as well as electronics, software, and biotechnology, i.e. high-tech;[250]
- Having zero commercial returns in the year of funding is not very important;[251]
- Larger firms (measured in employees).[252]

Favourable, external factors for venture capitalists include:

- Economic prosperity, because venture capital funds invest more in early-stage companies when there is more capital flowing into the market.[253] A startup should therefore consider the economic cycle before entering the market.
- Fiscal and legal framework, including investor protection (VCs have to rely on legal protection)[254], intellectual property protection, favourable rules about stock options and favourable tax rules.[255]
- Liquid capital market.[256]

There are also requirements that are important for the growth of the startup, so the startup should pursue these factors:

- Experienced VCs are preferred because of their higher value-adding capacity, even though the entrepreneur has to accept a temporary lower valuation;
- An independent VC instead of a VC affiliated to a financial corporation or government;

[240] De Rassenfosse & Fischer 2016, p. 237. Note that the influence of the entrepreneur on the startup's performance is often overestimated, so adding a charismatic visionary might be helpful. Source: Baum & Silverman 2004, p. 428.
[241] Nofsinger & Wang 2011, p. 2290; Paik & Woo 2014, p. 115.
[242] Baum & Silverman 2004, p. 427.
[243] Paik & Woo 2014, p. 115.
[244] Paik & Woo 2014, p. 115.
[245] De Rassenfosse & Fischer 2016, p. 244; Baum & Silverman 2004, p. 426.
[246] Institutional investors are less likely to finance a new product, because of higher uncertainty and failure; this effect is mitigated in countries with high legal protection, so the investor is protected, Nofsinger & Wang 2011, p. 2291.
[247] Bertoni, Colombo & Grilli 2011, p. 1032.
[248] Baum & Silverman 2004, p. 426.
[249] Bertoni, Colombo & Grilli 2011, p. 1032.
[250] Puri & Zarutskie 2008, p. 13; De Bettignies & Brander 2006, p. 826.
[251] Puri & Zarutskie 2008, p. 14.
[252] Bertoni, Colombo & Grilli 2011, p. 1032.
[253] Paik & Woo 2014, p. 114.
[254] Nofsinger & Wang 2011, p. 2289.
[255] OECD 1997, p. 5.
[256] OECD 1997, p. 5.

- Syndicated venture capitalists;
- Protection of intellectual property to minimize the expropriation threat by venture capitalists;[257]
- Not having obtained a public subsidy, because the likelihood of receiving venture capital decreases after obtaining a public subsidy (probably because the financial need has decreased).[258]

[257] Ueda 2004, p. 613.
[258] Bertoni, Colombo & Grilli 2011, p. 1032.

2.3.3 Banks

Description

A bank is "a business establishment in which money is kept for saving or commercial purposes or is invested, supplied for loans, or exchanged".[259] Basically, the bank lends low-risk money to the startup, in return for payment of interest and repayment of the principal amount. The bank is therefore more concerned about downside protection, and care less about the upside growth potential of the company.

The access of starting companies to bank credit in general has declined, because banks focus more on the more profitable market segments; the share of small business loans declined from 50% to 30% from 1995 – 2012.[260] Because of the recent crisis, banks have become more risk averse, and prefer lending to large firms. Disadvantages of lending to small firms are higher failure rates, less collateral, more information asymmetry, and less profit because the fixed costs per loan stays similar regardless of the loan amount.[261]

There is a difference between small banks and large banks. Large banks rely more on hard quantitative information such as financial ratios from audited financial statements, collateral, and credit scores.[262] Small banks rely more on qualitative information such as personal knowledge about the entrepreneur and the business.[263] Small banks have a comparative advantage in relationship lending to medium and large firms, based on the length of the relationship.[264] However, there is no comparative advantage in relationship lending to small firms.[265] Empirical research shows that small firms and large firms are more likely to borrow from large banks[266], while medium firms are more likely to borrow from small banks.[267] This can be explained by the fact that large firms have more information transparency, making it easier for large banks to quantitatively judge their performance.[268]

This difference in loan-approval is confirmed by the research of Cole et al., showing that large banks decide on the basis of standard criteria on the basis of financial statements, and small banks decide on the basis of the character of the borrower. For banks in general, the financial statements, firm size, firm age, and cash-to-assets are good factors, while owner delinquencies is a bad factor.[269] A smaller loan size-to-assets ratio is also preferred. Having multiple sources of financing has a bad influence on obtaining bank financing.[270] When large and small banks are distinguished, small banks may look more favourably upon loan applications from small firms compared with larger banks.[271] Larger banks have the following characteristics: they finance on average larger firms, less loans approved, a higher loan amount per loan, less often a loan relationship, and more clients in large cities.[272] Relationships are more important in rural areas, because most banks in rural areas are small banks.[273]

The average small business loan lent of large U.S. banks is higher ($593,000) compared with small banks ($146,000), while the charged interest rate of small banks was higher, see **Figure 6**. The charged interest

[259] The American Heritage Dictionary of the English Language 2018.
[260] Mills & McCarthy 2014, p. 25.
[261] Mills & McCarthy 2014, p. 6, 39.
[262] Berger & Black 2011, p. 724.
[263] Berger & Black 2011, p. 724, 734.
[264] Berger & Black 2011, p. 724, 734.
[265] Berger& Black 2011, p. 734.
[266] With small firms having below $100,000 assets, and large firms having more than $1,000,000 in total assets.
[267] Berger & Black 2011, p. 732.
[268] Berger & Black 2011, p. 731.
[269] Cole, Goldberg & White 2003, p. 20.
[270] Cole, Goldberg & White 2003, p. 21.
[271] Cole, Goldberg & White 2003, p. 29.
[272] Cole, Goldberg & White 2003, p. 36.
[273] Cole, Goldberg & White 2003, p. 19.

rate was on average 0.7-1.0% higher on loans obtained from small banks.[274] Because it is unknown whether small banks finance relatively more risky small firms, it cannot be concluded from these data that small banks charge higher interest rates, but based on the underlying theoretic rationale of higher average fixed cost per loan, these data might be indicative for higher borrowing costs when borrowing from small banks. Furthermore, the higher the loan value, the lower the interest rate; again, it is not clear whether this is an absolute relationship or depending on differing risk profiles. It might be that large banks reject the loan application because of the higher risk profile, and only small banks accept this higher-risk loan application, compensating with a higher interest rate.

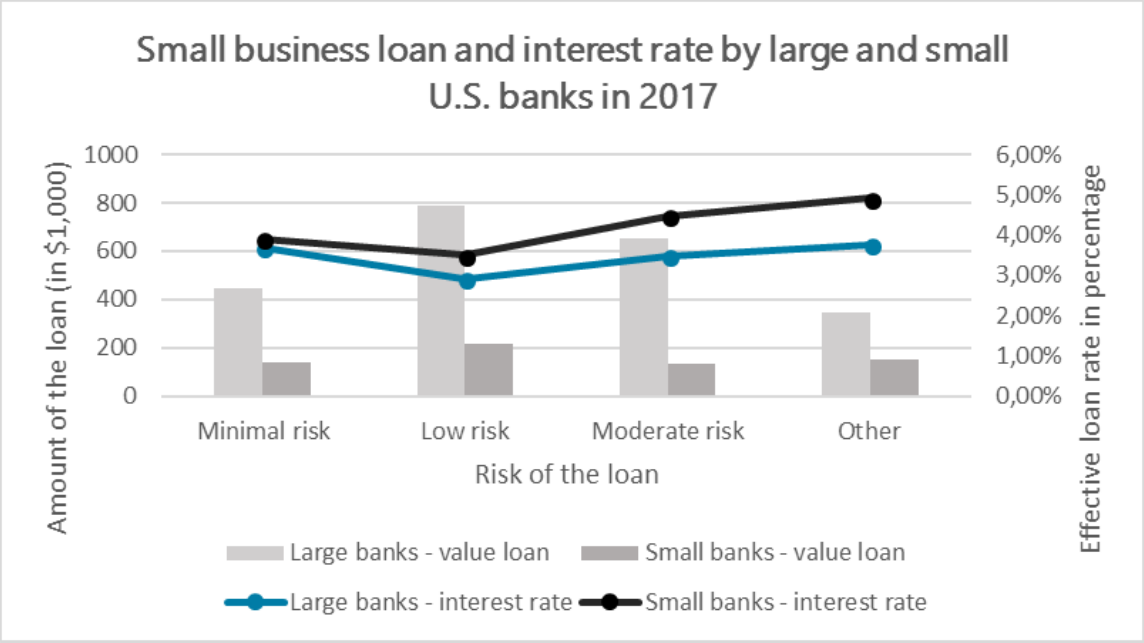


Figure 6: Small business loans and interest of large U.S. banks and small U.S. banks in 2017. Source: Board of Governors of the Federal Reserve System 2017.

The general investment instrument of banks is debt, which can be divided into short-term and long-term debt, with varying interest rates and collateral requirements. Banks generally do not hold equity: In most countries it is prohibited for banks to hold equity in non-financial firms, and banks want to evade lender liability when the firm goes bankrupt.[275]

Goal

The goal of the bank is to make a profit, while not losing the lent money. Another necessary objective, not always being a voluntary goal, is complying with the bank regulations. As a response to the financial crisis of 2007-2008, the Basel Accords imposed additional requirements on banks with regard to the capital buffers and risk profile.[276] In reaching the financial goal of making profits, the bank should therefore comply with the bank requirements.

[274] Board of Governors of the Federal Reserve System 2017.
[275] Huyghebaert 2003, p. 28-29.
[276] Basel Committee on Banking Supervision 2010.

Relationship with the entrepreneur

To achieve the goal of making a profit on the lent money while mitigating the moral hazard problems, the bank mainly uses restrictive covenants in the debt contract. Besides adverse selection and moral hazard, there is an additional risk shifting problem for banks. There are different approaches to these problems, which are partially the same approaches as venture capitalists use.

Banks use a form of staged financing, namely a smaller loan size when adverse selection and risk shifting problems are high.[277] With smaller loans, they limit their potential losses. Research shows, that overall leverage is lower for startups where risk shifting problems are higher, although they partially offset this lower bank debt with more trade credit.[278] Screening is used to prevent adverse selection, but this screening is not always cost-effective for small firms.[279] By lending short-term debt, the bank can gather more information through monitoring before deciding whether to terminate or extend the loan.[280]

Restrictive covenants in the debt contract give the bank the option to stop financing when certain events occur, for example a deterioration of the financial condition of the firm.[281] Banks can monitor the firm's activities by looking at the bank transfers.[282] Because of this extra information, the initial adverse selection and information asymmetry is mitigated. These restrictive covenants are also useful in preventing risk shifting, i.e. the incentive for the entrepreneur to take excessive risks at the expense of the bank.[283]

Small banks are likely to have more knowledge about their customers, i.e. they rely more heavily on pre-existing relationships.[284] This trust relationship may have positive effects on the moral hazard problems, comparable with the trust relationship between the entrepreneur and the angel investor.

Advantages for the startup

I conclude that the advantages for the startup of being financed by a bank, are the following, based on the abovementioned literature:: The most important advantage of obtaining bank debt is the money, which can be used for the growth of the startup. The advantage for the entrepreneur is that he can keep the control over the company and keeps the upside potential of the startup's value.[285] This may lead to the exertion of more intrinsic effort in making the startup a success.

The disadvantage of debt is the obligation to pay interest, so a steady cashflow is needed to pay those monthly bank payments. The problem with high-growth firms is, that they make large investments upfront, while the cashflows will materialize later, making debt an unsuitable financing source for these startups.[286] Another disadvantage of bank debt are the stricter liquidation rules of banks.[287] Because of the high insecurity associated with startups and the absence of collateral, the risk for the bank will be higher, leading to a high interest rate. Another obstacle are the used ratios, which are not suitable for high-tech companies with few tangible assets.[288]

[277] Huyghebaert & Van der Gucht 2007, p. 103.
[278] Huyghebaert & Van der Gucht 2007, p. 103.
[279] Huyghebaert & Van der Gucht 2007, p. 108.
[280] Huyghebaert & Van der Gucht 2007, p. 108.
[281] Huyghebaert 2003, p. 29.
[282] Huyghebaert 2003, p. 29.
[283] Huyghebaert & Van der Gucht 2007, p. 109.
[284] Cole, Goldberg & White 2003, p. 31.
[285] Huyghebaert & Van der Gucht 2007, p. 110.
[286] Huyghebaert & Van der Gucht 2007, p. 110.
[287] Huyghebaert & Van der Gucht 2007, p. 104.
[288] Bethune 1996, p. 66.

Another disadvantage is the non-existence of added intangible value: there is no financial motivation for the bank to help the startup grow. Although the bank's aim might be a long-term lender's relationship, there is no additional motivation, because the bank does not profit in the upside potential of the startup.

Concluding, the growth of the company is not important for banks as long as the startup maintains the payments and the covenants. Other disadvantages are the lack of added management value and the strict liquidation rules, making banks a second-best financier for high-growth startups. There are differences between small and large banks: large banks have the advantage of financing a larger amount, with the disadvantage of needing good financial statements. Smaller banks may finance less and have a higher interest rate, but they will judge the loan application (partially) on the basis of the previous bank relationship and character of the entrepreneur, which may ensure that the bank will give the loan. If the startup is more professional and evolved, large banks may be the best option because of the higher amount of financing. However, for new startups small banks may be the only option, on the basis of the entrepreneur's personality.

Factors

There are several requirements considered important by banks, according to the literature. The entrepreneur should (try to) comply with these requirements to obtain this type of funding:

- Cashflows and collateral (tangible assets);[289]
- Pre-existing relationship with the bank, of which the length is unimportant;[290]
- Large size of the startup;[291]
- Not having multiple sources of financing (because the private information of the bank becomes less valuable if the firm uses multiple financing services);[292]
- Having a checking account with that particular bank;[293]
- Startup in a growing industry;[294]
- (for large banks) Firm size, firm age, and a low debt-to-assets ratio are especially important.[295]

There are also requirements that are important for the growth of the startup, so the startup should pursue these factors:

- Favourable clauses with regard to liquidation of the startup, as well as restrictive covenants based on long-term performance instead of short-term performance.

[289] De Rassenfosse & Fischer 2016, p. 237-238.
[290] Cole 1998, p. 961.
[291] Cassar 2004, p. 267, 274.
[292] Cole 1998, p. 962.
[293] Cole 1998, p. 966.
[294] Huyghebaert & Van der Gucht 2007, p. 104.
[295] Cole, Goldberg & White 2003, p. 19.

2.3.4 Government

Description

The government is an important source of funding for new startups. The government helps startups with the aim of public benefits, such as innovation, growth, and job creation.[296] There are three types of government programmes: direct financing, financial incentives, and investor regulations.[297]

1. Direct supply of capital to the startup or startup's financiers, through an equity investment, or giving a low-interest, long-term, and/or non-refundable government loan, with examples being Belgium and Denmark.[298]
2. Financial incentives to invest in startups, like tax credits, a guarantee for part of the bank loans or part of the losses of venture capital investments in the startup, with examples being the United Kingdom, Japan and Finland.[299] According to Shane, the tax credit should be aimed at a specific goal, with a specific R&D tax credit being more effective than a generic tax credit for all startups.[300]
3. Investor regulations, so the permission for certain institutional investors (like pension funds) to invest in startups, with an example being the United States.[301]

According to the OECD, the direct equity investments and tax incentives are the most useful for stimulating startup investments, while loan guarantees are less beneficial because startups normally have a negative cashflow.[302] The programme should be focused on early-stage firms and technology-based firms, because these ones have the most difficulties with raising capital.[303]

As described, the investment instruments differ from debt to equity, and from tax incentives to more lenient regulation. The amount of the investment varies per country, ranging from a €5 million R&D loan in Germany, to an income tax relief of 20% in the United Kingdom, to an equity guarantee for venture capitalists of up to €7 million.[304]

Goal

The goal of the government with subsidies and tax reductions is to gain public benefits, and to fill the funding gaps for small businesses when the capital market is illiquid.[305]

The ultimate goal is to complement the private sector instead of competing with the private sector, so the governmental programmes should be phased out as soon as the private venture capital sector develops. Being too lenient with incentives and guarantees will lead to moral hazard problems with the private financiers, increasing public costs.[306] Empirical research shows that the government indeed fulfils a complementing role: in times of economic downturn (decrease in GDP growth, declining number of IPOs) with less VC investments, the supply of government funds increases.[307] Because venture capital

[296] OECD 1997, p. 2.
[297] OECD 1997, p. 4.
[298] OECD 1997, p. 7.
[299] OECD 1997, p. 7.
[300] Shane 2009, p. 147.
[301] OECD 1997, p. 7.
[302] OECD 1997, p. 8.
[303] OECD 1997, p. 13.
[304] Original currencies converted. Note that these amounts and government programs may change over the years. OECD 1997, p. 27, 28, 33.
[305] OECD 1997, p. 6.
[306] OECD 1997, p. 13-14, 17.
[307] Manigart & Beuselinck 2001, p. 10-11.

funds that invest in high-technology startups realise higher returns than their returns on non-high-technology startups (there is no shortage of capital for high-tech startups), it may be better for government VCs to not invest in these startups, but leave them to the private sector.[308]

The Dutch government performs well in the worldwide rankings for governments: in taxes and bureaucracy the Netherlands is ranked second, and in governmental entrepreneurial programs ranked first.[309]

Relationship with the entrepreneur

The normal moral hazard problems that exist in the relationship with the entrepreneur also apply to the equity or debt investment by the government. Besides, there may be additional moral hazard problems in the relationship with the subsidized direct investor. When the government subsidizes the provision of financing by venture capitalists and banks, these venture capitalists and banks can apply their own mechanisms (such as monitoring and contractual terms), as described in Paragraph 2.3.2 and 2.3.3.

When the government indirectly supplies equity by means of guaranteeing part of the losses of the venture capitalist (or guarantee for part of the bank loan), the venture capitalist (banker) may be inclined to take excessive risks, i.e. the problem of risk shifting in the relationship between the government and the subsidized financier. This may be mitigated by contractual covenants and agreements about the risk profile of investments, whereas monitoring and contractual agreements may lead to an optimal effort level of the venture capitalist.[310]

Adverse selection is another problem. High-quality startups and entrepreneurs may not need the government financing because they can obtain equity or a bank loan on their own merits, so only the low-quality startups apply for the government investment. This problem may be solved in the same way as debt providers do: screening, and only investing a limited amount.[311] The staged financing of venture capitalists may also be a good approach.[312] To overcome the information asymmetry, the applying startup should provide some basic financial statements as well as his business plan. In that way, the government can assess the viability and soundness of the business.[313]

It may be difficult to establish a trust relationship (like the angel investor), because of the multitude of applicants applying for the government investment. This trust relationship, and alignment of incentives, may be simulated by making the investment depending on the long-term success of the startup, so the entrepreneur will be more inclined to exert his best efforts.[314]

Advantages for the startup

I conclude that the advantages for the startup of being financed by the government, are the following, based on the abovementioned literature: The advantage for the startup is either a direct investment, or more opportunities to be funded by another investor because of the indirect improvement of the capital market for startups. With the guarantee for venture capital loss, the normal management advice and added value of these investors is retained.

---

[308] Manigart & Beuselinck 2001, p. 13.
[309] Global Entrepreneurship Research Association 2018, p. 130-131.
[310] Wong 2002, p. 19-20.
[311] Huyghebaert & Van der Gucht 2007, p. 103, 108.
[312] Cherif & Elouaer n.d., p. 2.
[313] Cherif & Elouaer n.d., p. 5.
[314] Fairchild 2011, p. 361.

According to the empirical research of Bertoni et al., a public grant may lead to an increase in sales.[315]

Concluding, the indirect governmental investments such as subsidies and tax credits for the investors are gladly received. However, the investment by a governmental VC fund or a governmental grant is second choice compared with the added value of a normal venture capital fund. Receiving a public subsidy leads to a lower chance of being financed by a venture capitalist, [316] thereby foregoing the added value of the venture capitalist. An R&D subsidy to stimulate research and innovation won't interfere with the product development and marketing added value of the venture capitalists, so applying for such a subsidy is recommended. And when normal venture capital funds do not want to invest, the government VC investment can play an important role in the financing of the growth of the startup.

Factors

There are several requirements for participating in the governmental programme. The entrepreneur and/or the financier should (try to) comply with the requirements of the specific programme. Apart from the requirements of the specific government subsidy, there are also two factors important for the government itself:

- The tax incentives should be ideally based on the realised capital gains, to add an additional motivation for the investors to make the startup a success;[317]
- The tax incentive should apply to direct investments instead of pooled investments, because of the added benefits of active monitoring and advice.[318]

2.3.5 Optimal financier

In these subparagraphs the three main financiers and their incentives were described. With each financier having his own risk profile and incentives to invest in the startup, as well as specific criteria and factors to decide whether the startup is a good investment, it is important to distinguish between these investing parties, and discern the optimal financing.

As followed from the discussion of the financiers, the angel investor and venture capitalist are the first-best financiers. When the angel investor and venture capitalist are compared, Chemmanur & Chen show that when the venture capitalists are scarce (and therefore the costs to obtain venture capital funding are high), all firms choose in the first round for the angel investors (these investors are assumed not to be scarce), and only the firms whose benefits from the venture capital investments exceed costs, switch in the second round to venture capitalists.[319] When the venture capitalists are not scarce, these financiers fund all firms in the first round, but only the best firms in the second round.[320] This can be explained by the overcoming of information asymmetry in the second round, so the venture capitalist knows whether he can add value to the firm or not by investing in it.[321] So angel investors finance the majority of the

[315] Bertoni, Colombo & Grilli 2011, p. 1037. The question is whether the public financing has an additional advantage beyond the money. For example, the empirical disadvantage of governmental VC funds is that they are less efficient in adding value to the startup compared with a normal venture capital fund, as discussed in Paragraph 2.3.2. Source: Luukkonen, Deschryvere & Bertoni 2013, p. 158; Bertoni, Colombo & Grilli 2011, p. 1040.
[316] Bertoni, Colombo & Grilli 2011, p. 1032.
[317] OECD 1997, p. 15.
[318] OECD 1997, p. 15.
[319] Chemmanur & Chen 2006, p. 12-13, 32-33.
[320] Chemmanur & Chen 2006, p. p. 31.
[321] Chemmanur & Chen 2006, p. 33-34.

first rounds of startups, and venture capitalists only finance part of this first round.[322] A venture capitalist that initially finances the startup but leaves, signals a low-quality firm.[323] The conclusion of this theory is that high-quality startups attract venture capital investment, while angel investors finance the other companies.

The optimal financier is the venture capitalist, because of the signalling function, added intangible value and contractual incentives. A syndicate of venture capitalists is also fine. Initially being financed by a serial angel investor and switching to venture capital is also valuable because of the alignment of the incentives based on the trust relationship and the longer-term view of the angel investor. The entrepreneur himself might prefer only the angel investor, because of the greater leniency compared with the covenants of banks and venture capitalists. Because the defined goal for the startup is high growth – to achieve economic benefits such as employment and sales tax – the venture capitalist or the syndicate of angel investors and venture capitalists is preferred though.

Important factors for the startup to consider are getting funded by an experienced venture capitalist known for his value-added properties, and negotiate about the contractual milestones, so these milestones are in line with the long-term growth of the startup instead of short-term sales or profit. It is important for the entrepreneur and his team to comply with the factors described in Paragraphs 2.3.1 and 2.3.2 (like strong product, good team, etc.), so the financiers will be interested in funding the startup. The bank debt and the direct government investment are second choices, although they are valuable if there are no venture capitalists or angel investors interested in the startup because of an economic downturn. The government subsidy for the seed phase in researching the product is also valuable.

In this paragraph the financier that would add the most value to the success of the startup was determined. In the next paragraph the optimal investment instrument will be chosen, to optimally incentivize both the financier and the entrepreneur.

[322] Chemmanur & Chen 2006, p. 39.
[323] Chemmanur & Chen 2006, p. 40-41.

2.4 Framework financing structure

In the previous paragraphs the preferred investment instruments of various financiers were discussed, and in this paragraph a theoretical framework will be drafted, to get the capital structure that contributes the most to the growth of the startup.

2.4.1 The optimal financing structure

The capital structure is "the makeup of the capitalization of a business in terms of the amounts and kinds of equity and debt securities".[324] There are several theories about the incentives of the financier and financed party, with each theory recommending a different approach to optimally mitigate the unwanted incentives, with corresponding capital structure. Seven theories about the optimal financing structure will be described below.

Theory 1: Principal agent theory

The first theory is the general economic theory with the principal-agent conflict of interests.[325] The agent has the choice between working and enjoying leisure, and if the principal does not monitor the selfish agent, the agent will engage in effort shirting, as discussed in Paragraph 2.2. The principal wants the agent to work, and has various means to achieve this goal, like information systems and outcome-based incentives.[326] Note that the agency problems are double-sided, so both the entrepreneur and the financier may have an incentive to shirk. The security design should be adjusted to the specific agency problem in the relationship between a specific startup and specific venture capitalist.[327] However, if a main rule has to be distilled out of the literature, the optimal capital structure would be equity for the entrepreneur (maximized incentives) and convertible bonds or preferred equity for the financier, because mandatory payments induce the entrepreneur to exert his best efforts (see Paragraph 2.3.2 – "Relationship with the entrepreneur").[328]

Theory 2: Trade-off theory

In a perfect capital market, the capital structure of the firm would not influence the value of the firm. However, imperfections in the capital market are taxation and bankruptcy penalties, so the value of the firm is affected by the capital structure.[329] The optimization of the capital structure is a trade-off between the present value of the tax advantages (interest is deductible from the profits, leading to lower corporate tax) and the present value of the increasing bankruptcy costs (the probability that the firm defaults on the loan and the lender declares the company bankrupt).[330] However, this general theory may have less explanatory power for the capital structure of a startup, because a startup is not a "normal" producing and profit-generating firm yet.

Theory 3: Pecking-order theory

According to the pecking-order theory, not all capital is equally attractive. As a result of asymmetric information between investors and managers, and therefore the managers of the firm prioritize their acquisition of capital: internal funds are used first, then debt is issued, and as a last resort, equity is

[324] Merriam-Webster Dictionary 2018.
[325] *See* Jensen, M.C. & Meckling, W.H., 'Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure', *Journal of Financial Economics* (3) 1976, pp. 305-360.
[326] Eisenhardt 1989, p. 69.
[327] Cumming 2005, p. 576.
[328] Casamatta 2003, p. 2071.
[329] Kraus & Litzenberger 1973, p. 911.
[330] Kraus & Litzenberger 1973, p. 912, 918.

issued.[331] Equity is issued last, because the stock price of the firm will fall, because the managers have an incentive to act in the existing stockholders' interest, so they will only issue new equity when the current stock price of the firm is overvalued.[332] However, even though this theory may be true, it has less explanatory power for startups,[333] because the theory is based on publicly traded companies instead of the financing decisions of young startups.

Theory 4: Control theory

The control theory describes the contractual allocation of control as a solution for the negative effects of trilateral bargaining.[334] Control is especially important at the time of exit, when the value of the firm has to be distributed between the parties. Both the entrepreneur and financier make firm-specific investments, which are hard to define in a contract, but both want their investments protected.[335] There are several contractual capital structures possible, each with their own optimal allocation of control. The ranking from most preferred to least preferred capital structure on the basis of total benefits:[336]

#1. Convertible debt or convertible equity;
#2. Combination of debt and equity with the entrepreneur having control in good times and the financier in bad times;
#3. Majority voting equity for the entrepreneur (non-voting or minority equity for the financier);
#4. Pure debt financing;
#5. Joint equity ownership;
#6. Majority voting equity for the financier.[337]

When the financier has voting equity, the entrepreneur should be compensated for his lost private benefits by a payout that is triggered by the sale of the firm, i.e. the golden parachute.[338] The control can be made contingent on financial performance, like a state-contingent board and voting power.[339] It is empirically shown that VCs are more likely to have board control and voting control in pre-revenue startups, and in industries with higher volatilities, which is consistent with the theory that as moral hazard

[331] Myers & Majluf 1984, p. 189, 215.
[332] Myers & Majluf 1984, p. 189, 220.
[333] *See* Frank, M.Z. & Goyal, V.K., 'Testing the pecking order theory of capital structure', *Journal of Financial Economics* 67, 2003, pp. 217-248, who show that the net issued equity exceeds the net issued equity, and the net equity issues track the financing deficit more closely than the net debt issues, i.e. the empirical pecking order differs from the theoretical pecking order of Myers & Maljuf.
[334] Berglöf 1994, p. 249.
[335] Otherwise it would be possible for the financier to sell his equity stake to another firm, after which this newcomer fires the entrepreneur without compensating him (expropriation of managerial quasi-rents, i.e. problem for the entrepreneur); or a new manager could take assets out of the firm without paying their market value, cheating the financier (asset stripping, problem for both the entrepreneur and financier). Assumptions in this theory are the following: the economic state after the sale is good or bad (with private reputation benefits for the entrepreneur in good states, and the financier caring about the firm value in bad states), with the good economic state leading to free-riding by the remaining non-controlling party on the efficiency improvements realized by the buyer, the bad economic state leading to asset stripping for the remaining party, with the seller always being fully compensated. The contractual allocation of returns and control – by means of the investment instruments of debt and equity – can protect both of the parties against these problems. Source: Berglöf 1994, p. 248, 254.
[336] *See* for the complete theory, proof and arithmetic examples Berglöf 1994.
[337] It is assumed that the financier does not have more private benefits than the entrepreneur, because of the defined financial goal for the financiers. Berglöf 1994, p. 265.
[338] Berglöf 1994, p. 258; Joint ownership (as well as pure debt) is better than non-voting equity when the expected dilution in bad states is higher than the profiting from the expected value improvement by the new buyer in good states. With convertible debt, the financier converts the debt into equity in good times (profiting from the upside), but not in bad times. In good times (debt is repaid), the financier has no control; in bad times (default on debt), the control is transferred to the financier, unless that financier converted his debt into equity. Source: Berglöf 1994, p. 259-260, 262.
[339] Kaplan & Strömberg 2002, p. 20.

problems (or financial constraints) become more severe, the control ultimately changes from the entrepreneur to the financier.[340]

Theory 5: Debt theory

A debt investment will incentivize the entrepreneur more, because of the seniority of debt (the investor has a senior claim in case of bankruptcy) and because of the liquidation possibilities (bad performance can be punished by liquidating the firm).[341] Because of those threats, the entrepreneur will be motivated to pay the periodical interests.

Theory 6: Venture capital theory

The venture capital theory is not a general financial theory, but a specific theory about venture capital. The theory includes a double moral hazard problem between the venture capitalist and the entrepreneur: both parties have to be incentivized with "residual cashflow rights" in order to exert effort (for the venture capitalist: besides funding also the value-adding advice).[342] The best investment instrument is convertible securities, and the theoretical explanation for these securities is that they prevent the entrepreneur from window dressing, by making conversion undesirable for the entrepreneur because of the low conversion price.[343] The use of convertible preferred equity with contingent control rights is explained by Hellmann on the basis of the exit: in the case of an acquisition the investors profit from having preferred equity, but in case of an IPO they prefer common equity.[344]

Theory 7: Non-financial theories

Other theories that explain why certain securities are used more than others, include tax advantages for certain securities (a low capital gains tax leads to the use of more convertible preferred equity),[345] and unfavourable market conditions (more downward protection).[346] Another theory is the control theory of the entrepreneur: an entrepreneur who enjoys private benefits because of his control over the startup (social status) prefers debt, because more equity leads to less control.[347]

My conclusion is, that the theories have similarities. To incentivize the financier as well as the entrepreneur, both parties should take part in the firm's profits. According to the venture capital theory and control theory, the *optimal investing instrument* is convertible equity for the financier, or, as second-best, majority voting equity for the entrepreneur with certain prearranged performance thresholds. The principal agent theory suggests a similar structure: equity for the entrepreneur, and preferred equity or convertible securities for the financier. The result is that the entrepreneur is incentivized because of his part in the profits, while the financier has more room to determine whether he wants to stay involved with the firm, based on the firm's performance.

My second conclusion is, that the *optimal capital structure* is a structure with convertible (preferred) equity for the financier and prearranged performance thresholds for the entrepreneur, and (at least the majority) common equity for the entrepreneur.

---

[340] Kaplan & Strömberg 2002, p. 21.
[341] Kaplan & Strömberg 2002, p. 22-23.
[342] Kaplan & Strömberg 2002, p. 26.
[343] *See* for more information Kaplan & Strömberg 2002, p. 26-27.
[344] Hellmann 2006, p. 652.
[345] Cumming 2005, p. 608.
[346] Cumming 2005, p. 611.
[347] Mueller 2002, p. 5, 18, 21.

2.4.2 Control allocation

Contracts

As described in Paragraph 2.4.1, the optimal financing structure prescribes to allocate the majority of the risk about whether the startup will succeed or not, to the entrepreneur. In that case, the entrepreneur has the majority of the equity, with certain prearranged performance thresholds, and the financier has preferred equity or convertible equity. If the entrepreneur fails to deliver the promises and achieve the performance milestones, the venture capitalist takes over control on the basis of the contractual arrangements. This control allocation is laid down in the contract between the entrepreneur and the financier, and risk and reward are connected.

The risk profile of the entrepreneur and the venture capitalist probably differ. The general assumption is that humans are more risk-averse, and companies are risk-neutral. It is not clear whether this assumption also holds for the entrepreneur of a high-growth startup: it might be that their risk profile is risk neutral, or even risk seeking.[348] Risk can be divided in firm-specific risk and market risk. Firm-specific risk depends on the financial position and the market strength of the business, and market risks depends on the general state of the economy as a whole.[349] The firm-specific risks can be diversified away by investing in several firms, but the market risk cannot be diversified.[350] The entrepreneur is not able to diversify away the firm-specific risk, because, generally speaking, he only has one startup.

In the contract between financier and startup, there are several terms to allocate control:

1. The type of investment: the convertible preferred equity is optimal (see Paragraph 2.4.1)
2. The price, defined by the valuation of the company
3. Liquidation preferences
4. Voting rights and board rights: the majority voting power for the entrepreneur, restricted by the control rights in case of bad performance (see Paragraph 2.4.1)
5. Automatic conversion
6. Antidilution
7. Restrictive covenants: more strict for debt-like contracts (see hereafter in Paragraph 2.4.2)

Note that these contractual provisions can complement or substitute each other: voting and board majority are positively correlated and complement each other.[351] The venture capitalist and the founder have more control rights relative to their cashflow rights (at the expense of third parties), and the cashflow rights and control rights of the VC increase over time.[352] The venture capital contracts form a heterogenous group. Certain venture capital firms have more contract mechanisms than others, for example independent VCs have more mechanisms to support their active participation in the firm, compared with venture capital firms that have a bank or public entity as main investor.[353]

Covenants

Contracts that are more structured like debt, for example venture capitalists without a board majority, have more covenants than contracts that are structured like equity.[354] When the cashflow is contingent, (cumulative dividends, participation rights, automatic conversion rights, there are also more covenants

[348] *See* Kihlstrom, R.E. & Laffont, J., 'A General Equilibrium Entrepreneurial Theory of Firm Formation Based on Risk Aversion', *Journal of Political Economy*, Vol. 87, No. 4, August 1979, pp. 719-748.
[349] Freear, Sohl & Wetzel 2002, p. 276-277.
[350] Freear, Sohl & Wetzel 2002, p. 277.
[351] Kaplan & Strömberg 2002, p. 28-30.
[352] Kaplan & Strömberg 2002, p. 28, 33.
[353] Hirsch & Walz 2011, p. 522.
[354] Bengtsson 2011, p. 1937.

to protect the financier.[355] There are less covenants when the venture capitalist has a board majority.[356] Younger firms have less covenants than older firms, because there are less valuable assets.[357]

In general, there are no covenants about working capital or net worth in the contract, but most of the covenants are negative covenants: the entrepreneur is not allowed to sell assets, or change the line of business.[358] The average number of covenants is 2.9.[359] These negative covenants can be divided into two groups: boilerplate covenants, and additional covenants. Some covenants are always included in venture capitalist contracts, like not changing the voting rules or the Board of Directors, not issuing new securities, not selling all the assets, and not liquidating the firm.[360] In most other contracts there are additional covenants (in % of the sample) about:[361]

- Issuing debt (60%), with in ninety percent of these cases an exemption for small amounts of debt;[362]
- Issuing junior securities (58%), with veto rights given to the venture capitalists;
- Selling assets (41%), licensing out technology (23%) or acquiring another company (24%);
- Replacing the current CEO (10%);
- Changing the current stock option plan for employees (20%);
- Monitoring, i.e. changing accounting firms or relocating the headquarters of the firm (20%).

2.5 Theoretical findings summarized

A theoretical pyramid based on the legal and financial literature was drafted in this chapter. The first layer consisted of a description of factors that are important for a successful startup. A startup is defined as successful when it generates economic prosperity and employment. Because high-growth startups contribute the most to these goals, the thesis will focus on these high-growth startups, instead of startups in general. The growth will be measured by means of the market value and sales. Because a thriving startup ecosystem leads to more successful startups, it is important to further develop this ecosystem.

The second layer are the involved parties, namely the entrepreneur and the four financiers. The entrepreneur is the driving force behind the startup, and his ideas and vision are necessary. Because the entrepreneur is mainly incentivized by financial gains, several conflicts may occur between the entrepreneur and the financiers, including information asymmetry, adverse selection and moral hazard. The angel investor primarily uses his trust relationship with the entrepreneur to mitigate these problems, the venture capitalist uses contractual control rights, the bank uses restrictive covenants, and the government uses monitoring, control rights and covenants. The angel investor and venture capitalist have the ability to add value to the startup, by means of coaching and management experience. To achieve a jumpstart in the value and growth of the startup, the startup should obtain venture capital, ideally from an experienced independent venture capital fund. There are several factors that venture

[355] Bengtsson 2011, p. 1938.
[356] Bengtsson 2011, p. 1938.
[357] Bengtsson 2011, p. 1939.
[358] Bengtsson 2011, p. 1927.
[359] Bengtsson 2011, p. 1935.
[360] Bengtsson 2011, p. 1931, 1935.
[361] Bengtsson 2011, p. 1931, 1935-1936.
[362] In Bengtsson's research, the median amount of debt is $225,000, which seems to be a large amount for startups.

capitalists consider important, including strong growth expectations, modern industries, and a strong founders' team.

The third layer is the financial structure used by the parties. According to several theories (principal agent theory, control theory, and the venture capital theory), both the entrepreneur and the financier should be incentivized to exert their best efforts. This can be done by convertible (preferred) equity for the financier with prearranged performance thresholds for the entrepreneur, and majority common equity for the entrepreneur. If the entrepreneur does not achieve the performance thresholds, the financier can exercise his control rights, and take control over the startup. To achieve the long-term growth of the startup, it is important to set goals in line with the long-term growth of the firm, although these goals can be broken down into smaller goals.

The fourth layer is the control allocation as laid down in the financing contract between the financier and the entrepreneur and his startup. Contract provisions include the type of investment instrument, voting rights and board rights, and restrictive covenants. Each of these provisions may allocate more or less risk and control to the parties. The positive voting rights and the negative covenants may substitute each other, while the voting majority and board majority complement each other.

Based on the factors in this theoretical framework about "how" to achieve a high-growth startup with high market value, the next chapter will empirically investigate Dutch startups and their investment instruments and control allocation as laid down in the financing contract.

3. ANALYSIS DUTCH STARTUPS

In this chapter the used dataset will be described, and several statistical tests will be used to determine which types of financing are used in the Netherlands, and how high the investments are in Dutch startups. Subsequently, a short qualitative research will be performed where the control allocation as laid down in the financial statements of Dutch startups is examined.

3.1 Methodology

3.1.1 Description dataset

The data source used for the empirical analysis is the dataset of CrunchBase. CrunchBase is a public database of private companies. The dataset consists of companies established and funding rounds achieved in the period between 01/01/1960 and 04/12/2015 (the last update of the dataset was 04/12/2015).[363] This dataset contains data from 66,368 companies (hereinafter: the Companies dataset) and 114,950 investing rounds (hereinafter: the Round dataset). The company information includes the company name, industry, country, city, status of the company, founding date, total funding, and number of funding rounds. The rounds information includes the same information (except for the status, founding date, and number of funding rounds), and in addition the type of funding, such as venture capital or angel investments. See **Annex I** for an overview of the variables used.

The goal of the empirical analysis is twofold: (1) getting the descriptive statistics for the total funding obtained and the financing round amount, and (2) comparing the subgroup means within a variable to determine whether they significantly differ from each other, for example the various types of funding. The depending variable in the Companies dataset is the total funding of a company, and in the Round dataset the investment round amount. The independent variables are the age (continuous numeric variable[364]), the number of rounds (integer numeric variable), the country (categorial variable), and the type of funding (categorial variable).

The data were filtered on the ISO-country code[365], so only the companies of that specific country were included. The startups founded on or after 4 December 2010 were defined as startup (hereinafter: the Startup Companies dataset). Startups are companies of five years and younger, at the time of the compiling of the data (i.e. 4 December 2015). Although five years is an arbitrary number, there is no clear definition of a startup, so five years was chosen as the cut-off point. Note that the Round dataset did not include the founding date of the startup (only the date of the financing round), so the round amount depending on age could not be determined, and hence, no distinction between startups and not-startups could be made for the financing rounds.

The outliers in the dataset were deleted. The entries with missing values for the total funding or round amount were also deleted. Companies without a known age got the standard founding date of January 1900 in CrunchBase, leading to a calculated age of 115.93; therefore all companies older than 115 years old (i.e. all companies without a known founding date) were excluded. This was done because if these companies would have been included, it would not have been not clear whether the company was a

[363] CrunchBase 2015, available on <https://github.com/notpeter/crunchbase-data/blob/master/readme.md>.

[364] The age was altered into a integer numeric variable in order to be able to perform an ANOVA-test, to examine whether the round amount differs depending on the age of the company. So the numeric age of 7 means the companies with an age between 6.00 and 6.99.

[365] The ISO ALPHA-3 Codes are available on <http://www.nationsonline.org/oneworld/country_code_list.htm>.

startup, or not, which would have distorted the analysis. Finally, no correction for inflation was applied, because of the relatively short time period of the startup data (five years or less).

3.1.2 Statistical tests and assumptions

The statistical tests that were used are the ANOVA-test and the Tukey-test. The one-way ANOVA test compares the means from several subgroups within one variable. The ANOVA-test is the most appropriate test because the variables (number of funding rounds, age, status, type of funding) all consist of more than two subgroups, and are categorical variables instead of continuous variables. The advantage of an ANOVA-test is that it determines with one value (the F-value) whether the group as a whole contains differing means of the subgroups. The null hypothesis of the ANOVA-test is that the means are the same, so H_0: $\mu_0 = \mu_1 \ldots = \ \ldots = \mu_n$, with the alternative hypothesis stating that the means of these groups are not the same, so H_1: $The\ means\ are\ not\ all\ equal$. The outcome of the ANOVA-test determines whether all the group means are the same, or whether not all the group means are the same. To determine which group means differ from each other, the Tukey-test is used to compare all possible pairs of the several subgroups, to determine to what extent the several group means differ from each other.

A p-value of 0.05 will be used to accept or reject a hypothesis; a p-value of 0.01 gives stronger evidence, and a p-value of 0.10 provides only weak evidence. The p-value is the probability of finding the described results, when the null hypothesis is true.

There are several assumptions for the ANOVA-test:

- First, the depending variable has to be measured on a continuous scale. The round amount and the total funding are both continuous variables, because both are values expressed in dollars.
- Second, the observations are independent from each other.[366] It is assumed that the observations in the groups and the groups among themselves are unrelated to each other.
- Third, there are no significant outliers. Significant outliers were deleted on the basis of the plotted graph of values.[367]
- Fourth, the depending variable is normally distributed, so the round amount and total funding are normally distributed. This will be tested separately per country, per depending variable, and per dataset (general and startup dataset). To test the null hypothesis of the assumption of normality, the Shapiro-Wilk test was used.[368] When the resulting p-value is lower than 0.01, the assumption of normality is rejected. However, when the data are not normally distributed, but the sample size is large enough (30-100), the central limit theorem states that the averages will converge into a normal distribution.[369] Although the official Shapiro-Wilk test rejected the normality for all Companies data and Round data (see **Annex III**) the sample sizes are large enough, so it is assumed that there is (at least approximately) a normal distribution of the data. And the ANOVA-test is robust even though the data is not normally distributed.[370]

[366] Laerd Statistics, No. 2, p. 1.
[367] Note, that although the general outliers have been deleted, it is still possible that the average of a specific subgroup may still be biased because of a specific outlier (i.e. not a general outlier, but still "outlier" enough to bias the outcome for a specific group).
[368] STATA 2017, p. 14.
[369] Mordkoff 2016, p. 2.
[370] Laerd Statistics, No. 3, p. 1.

- Fifth, there is homogeneity of variances, so no heteroskedasticity.[371] This will be tested with the Levene test.[372] Most Companies startup datasets are assumed to have homogeneity of variances, see **Annex III**. However, the Round datasets do not have homogeneity of variances.

*See for the used Stata commands, **Annex II**, and see for the assumptions tests no. 4 and 5, **Annex III**.* The most important results of the empirical analysis will be shown, meaning that some results will be summarized in the main text and not shown (or not shown in their entirety) in the tables. All data and results are available from the author upon request, as well as reviewed by the supervisor.

[371] Laerd Statistics, p. 1.
[372] STATA 2017, p. 13.

3.2 Quantitative results Netherlands

In this paragraph, the Dutch companies in general and the investment rounds in Dutch companies are researched, subsequently narrowed down to the Dutch startups.

3.2.1 Results Companies dataset

The average total funding per Dutch company (country code NLD) is $7.5 million, with an average of 1.6 funding rounds and an average age of 5.8 years old (see **Table 3**), based on 331 observations.[373] This high average total funding can be explained by the fact that all the companies are included in the data set, including the not-startup companies.

With regard to the number of founding rounds, 95% of the companies have 1-3 funding rounds, and the total absolute funding (i.e. the total funding over the whole lifetime of the company) increases when the number of funding rounds increases (see **Table 3**). This is logical, because if there are more funding rounds, the company also gets more money (all other things being equal), i.e. a higher total funding. The hypothesis that the averages of the funding rounds are the same, is rejected by the ANOVA-test with a p-value of 0.0003 (F = 4.74). More specifically, according to the Tukey-test, the total funding of companies with 1 round versus 3 rounds significantly differs (p = 0.000), as well as 2 rounds versus 3 rounds (p = 0.066); the other differences are not significant.[374]

Of all the companies, 88% is still operating, 5% is acquired, 6% is closed, and 1% has done an IPO. The hypothesis that the average amount of each status is the same, is rejected with a p-value of 0.0000 (F = 8.82). The total funding amount the IPO company differs significantly from the total funding amount of the operating, closed and the acquired company (p = 0.000, 0.035 and 0.042), the acquired company also differs significantly from the operating and closed company (p = 0.018 and 0.042), but the closed company does not differ significantly from the operating company (p = 0.932).

The startup and not-startup are significantly different with regard to their average total funding: $1,999,879 versus $16,611,928 (t = 6.61, p = 0.000).

Table 3: General descriptive statistics of companies in the Netherlands

	Mean	Standard deviation	Minimum	Maximum[375]
Total funding	7,518,024	20,700,000	11	14,900,000
Funding rounds	1.58	0.93	1	6
Age	5.82	6.20	0	72.92

Overview of the total funding of Dutch companies depending on the number of funding rounds

Funding rounds	Mean	Standard deviation	Frequency	Percentage
1	4,297,151	14,960,058	207	63%
2	9,133,055	20,636,502	81	24%
3	21,363,751	40,363,084	28	8%
4	20,593,104	30,164,365	8	2%
5	9,814,831	13,362,974	5	2%
6	23,587,078	29,872,317	2	1%

[373] In this dataset 5 outliers of $200+ billion were deleted.
[374] Note that the funding rounds 4, 5, and 6 each have less than 10 observations, which may explain the lack of significance.
[375] Note that this is not the absolute maximum, because of the deleting of outliers.

Overview of the total funding of Dutch companies depending on the status of the company

Status	Mean	Standard deviation	Frequency	Percentage
Operating	6,488,883	20,154,466	291	88%
IPO	55,247,963	27,913,638	3	1%
Acquired	21,198,265	25,783,412	17	5%
Closed	3,704,327	7,828,993	20	6%

3.2.2 Results Companies startups dataset

The average total funding of Dutch startups is $880,000[376], with on average 1.5 funding rounds, and an age of 2.8 years, based on 201 observations.[377]

With regard to the funding rounds, 90% of startups have had 1-2 funding rounds. The hypothesis that the averages of the total funding depending on the number of funding rounds are the same, is not rejected (F = 2.00, p = 0.081), so the means of the total funding depending on the number of funding rounds are not significantly different. Of all the Dutch startups, 96% is still operating, 3% is closed, only 1 startup is acquired, and zero startups have done an IPO. The hypothesis that the averages of the total funding depending on the status of the startup are the same, is not rejected (F = 1.60, p = 0.204), probably due to the small subsamples (see **Table 4**). The maximum number of funding rounds is 6.

Table 4: General descriptive statistics of startups in the Netherlands

	Mean	Standard deviation	Minimum	Maximum[378]
Total funding	880,588	1,253,056	2,500	7,479,291
Funding rounds	1.50	0.87	1	6
Age	2.79	1.25	0	4.98

Overview of the total funding of Dutch startups depending on the number of funding rounds

Funding rounds	Mean	Standard deviation	Frequency	Percentage
1	747,673	1,197,458	133	66%
2	1,046,790	1,378,153	48	24%
3	1,226,815	1,131,332	13	6%
4	2,429,148	1,510,503	3	1%
5	537,115	370,572	3	1%
6	2,464,160	0	1	0%

Overview of the total funding of Dutch startups depending on the status of the status

Status	Mean	Standard deviation	Frequency	Percentage
Operating	890,060	1,266,308	193	96%
IPO	n/a	n/a	n/a	n/a
Acquired	2,651,558	0	1	0%
Closed	366,414	437,095	7	3%

[376] Although this total funding amount is lower than the Dutch companies in general, this is also due to the deleting of several outliers in the startup dataset, in order to get a more normalized dataset.
[377] In this dataset 4 outliers of $10+ billion were deleted.
[378] Note that this is not the absolute maximum, because of the deleting of outliers.

3.2.3 Results Rounds dataset

Of all the financing rounds, most rounds are seed capital (43%, average round amount of $400,000), venture capital (35%, average round amount of $10.5 million) and angel capital (9%, average round amount of $650,000), with an average round amount of $5.6 million and a total number of 525 observations (see **Table 5**).[379] The private equity with $43 million has the highest average financing round of all funding types. Although it is possible that venture capital or angel capital is used in the category "undisclosed", the "undisclosed" category only constitutes two percent of the data.

The hypothesis that the round amounts depending on type of funding are the same, is rejected (F = 29.63, p = 0.0000).

- Private equity is significantly higher than all other types of funding (p = 0.000).
- Venture capital is significantly higher compared with seed capital (p = 0.000) and angel capital (p = 0.000).
- There is no significant difference between the average total funding by an angel investor and seed capital (p = 1.000).

The best way for a Dutch company to acquire $1 million funding is convertible notes, product crowdfunding, venture capital, or private equity (if possible) (*see* Fout! Verwijzingsbron niet gevonden.). Furthermore, 18% of the angel investors do fund more than $1 million, varying from $1 million to $4 million.

Table 5: The round amount of Dutch companies depending on the type of funding

Type of funding	Mean	Standard deviation	Frequency	Percentage
Angel capital	646,932	859,031	49	9%
Convertible note	1,320,820	3,912,952	12	2%
Debt financing	4,716,932	6,853,882	8	2%
Equity crowdfunding	136,597	78,417	6	1%
Grant	488,335	753,535	11	2%
Private equity	43,318,617	44,884,310	18	3%
Product crowdfunding	2,714,412	4,186,563	5	1%
Seed	402,558	580,933	224	43%
Undisclosed	3,659,127	5,887,424	8	2%
Venture capital	10,540,237	14,494,367	184	35%
Post IPO equity	n/a	n/a	n/a	n/a
Post IPO debt	n/a	n/a	n/a	n/a
Non-equity assistance	n/a	n/a	n/a	n/a

[379] In this dataset 6 outliers of $200+million were deleted.

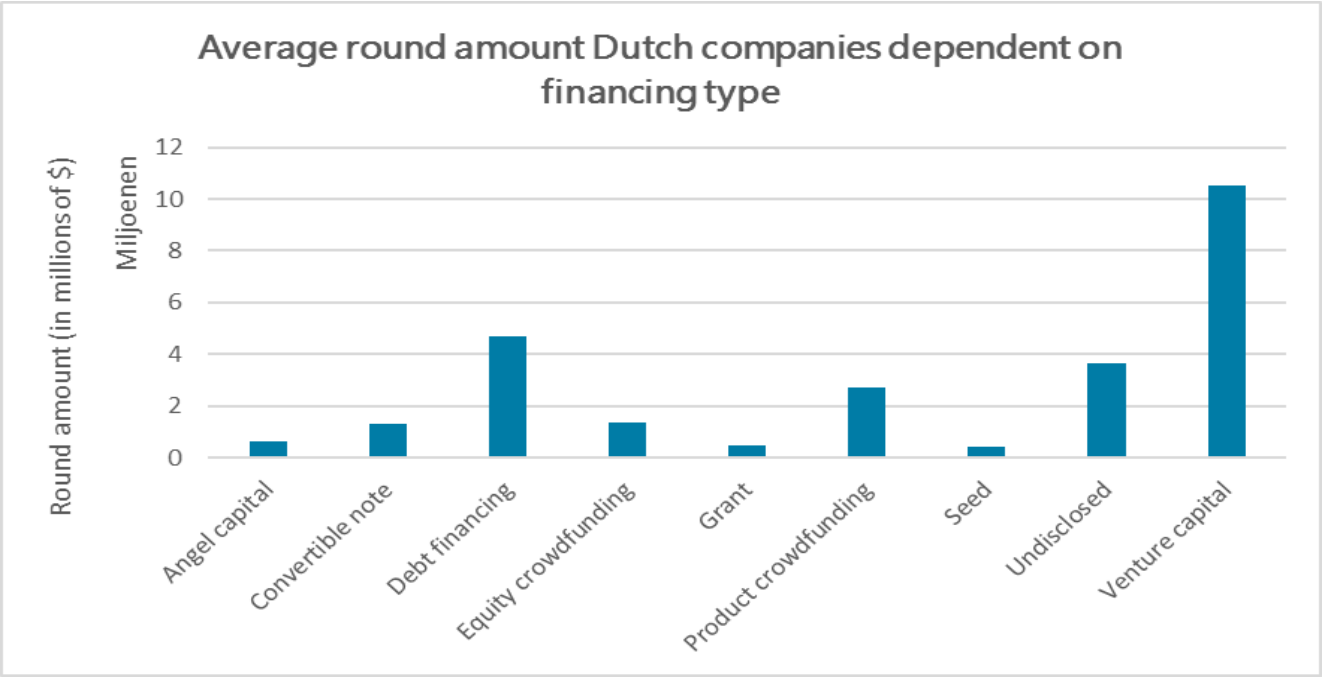


Figure 7: The average round amount of Dutch companies depending on the financing type. Note that the private equity is not included, because the high value ($40+ million) did not fit into the graph and distorted the graph.

3.3 Qualitative results Netherlands

In this paragraph an indicative qualitative analysis will be performed, to determine whether the financial statements of Dutch startups include information about the financing structure and the legal aspects of this financing structure. In this analysis two companies will be briefly analyzed: Voltea and PastBooks.

The first company is Voltea B.V., with the business goal of using a water deionization technology. Their first financing round was seed capital, followed by four venture capital rounds of $4+ million (*see* **Figure 8**Fout! Verwijzingsbron niet gevonden.). According to the documents of the Dutch Chamber of Commerce, this is a private company, and it was registered in the trade register in 2002. The sole shareholder is Voltea Limited in the United Kingdom; Voltea B.V. has two directors, living in South Africa and the United States. The corporation had changed directors, names and addresses several times.

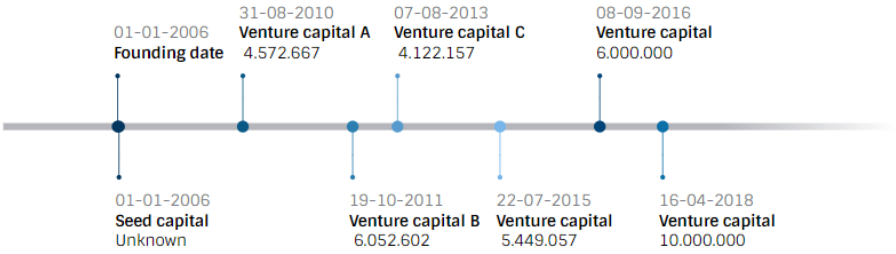


Figure 8: Timeline of the financing rounds of Voltea.

Growth of the startup (1st layer) The growth of the company can be measured in market value, or the tangible and intangible assets, or the sales.[380] According to the Financial Statements, Voltea had an employment growth of +18% and -24% in 2013-2015. The growth in assets was very volatile, so the growth in stock may be a better option, [381] which was respectively +18% and +77%. There was no profit-and-loss account publicized, so the sales growth was not available, and neither was the market value.

Entrepreneur and financiers (2nd layer) and investment instruments (3rd layer) There is no information available about the entrepreneur in the Financial Statements. Although there are two directors of Voltea, it is not sure whether they are just director, or also the founders of the company. The financiers cannot be found in the Financial Statements, because the liabilities side of the balance only includes equity, short-term debt and long-term debt. It is therefore also not clear what investment instruments are used.

However, additional information can be found on other websites: on the website of CrunchBase additional information is found about the financiers. [382] Voltea B.V. has had six venture capital rounds, of which five rounds were syndicated with three or four investors. There is no central entrepreneur, only alternating CEOs.

Control allocation (4th layer) The contractual terms seem to include a Board seat for the investor, and staged financing (so probably performance thresholds). One of the two directors, Ian Lane, became investment director for Unilever Investments (one of the venture capital investors of venture capital round D) at the moment of the venture capital investment. Therefore, the control seems to be exercised by means of a board seat. The same four investors, i.e. Unilever Ventures, Rabo Ventures, Pentair, and

[380] See Paragraph 2.1.1 ("Successful startup") for the theoretical framework.
[381] Note that the growth in stock can be positive (more demand, so the need for more stock), or negative (the products cannot be sold on time, so the stock is accumulating).
[382] CrunchBase, 'Voltea' 2018.

ETF Partners are the only financiers, and these investors invested at least four times in Voltea B.V., signaling staged financing on the basis of performance thresholds.

The second company is PastBook, with the business goal of collecting photos. Their first financing was a grant, followed by four seed capital rounds ranging from $20,000 to $350,000, and finally a financing round with $2 million in convertible notes (*see* **Figure 9**).

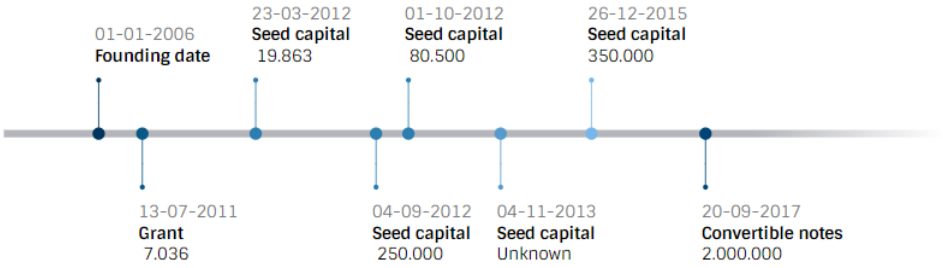


Figure 9: Timeline of the financing rounds of PastBook

Growth of the startup (1st layer) PastBook experienced a growth in fixed assets of -24% and + 60%, so this seems a very volatile growth metric. The working capital increased with +33% and +75%, and the employees increased with +200% and +100%. This company seems therefore a "high-growth company".

Entrepreneur and financiers (2nd layer) and investment instruments (3rd layer) The Financial Statements do not give any information about the financiers and the used investment instruments. However, the website CrunchBase does give additional information:[383] Vortex Capital Partners. The financier of the last seed capital round is the same financier as the venture capital round, with the venture capital being invested by means of convertible notes. The entrepreneur is still present: Stefano Cutello is the founder and CEO of PastBook.

Control allocation (4th layer) With regard to the contractual allocations of control, the venture capitalist has a board seat, in the form of a "VP Business Developer". The venture capital investment after the seed capital investment, by the same investor, signals staged financing.

Concluding, there are several investment instruments used in the financing of companies: from seed capital to multiple venture capital rounds (Voltea), or from a grant to multiple seed capital rounds to venture capital (PastBook). Other companies go from grants to seed capital to angel investments, finally followed by a venture capital round, with each round a higher amount than in the preceding round.[384] Other companies go from an angel investment round to multiple venture capital rounds (The New Motion), and some companies reach for the sky by starting with venture capital and finishing with multiple private equity rounds and debt financing (O3b Networks).[385]

[383] CrunchBase, 'PastBook' 2018.
[384] For example, a grant of $20,000 to an angel investment of $50,000 to a venture capital investment of $400,000 (Qwiksense).
[385] These companies were randomly chosen on the basis of the CrunchBase Rounds dataset, on the basis of having had five financing rounds or more.

3.4 Findings summarized

The quantitative analysis was done on the basis of the CrunchBase startup dataset. The results of the Companies dataset showed that the average total funding per Dutch company is $7.5 million. The startup and not-startup are significantly different with regard to their average total funding: $2 million versus $16 million. With regard to the status of the startups, 96% is still operating, and 4% of the startups have been closed. For the companies in general (startups and not-startups) the total funding of companies with three funding rounds is significantly higher than the total funding for companies with one or two funding rounds (which is a logical relationship). Furthermore, the total funding of an IPO company is significantly different compared to operating, closed and acquired companies; the same for acquired companies compared with operating and closed companies (all p-values less than 0.05). However, there is no significant difference between open and closed companies. For startups, there is no significant difference between the total funding depending on age, neither a significant difference for total funding depending on the status of the startup, which may be due to the low amount of observations.

The average financing round amount is $5.6 million. The results of the Rounds dataset showed that 43% of all round amounts of Dutch startups were seed capital (average round amount of $400,000), 35% was venture capital (average round amount of $10.5 million), and 9% was angel capital (average round amount of $650,000). Private equity significantly differs from all other types of funding ($p = 0.000$), and venture capital differs from seed capital ($p = 0.000$) and angel capital ($p = 0.000$).

Subsequently, a brief qualitative analysis was done on the basis of some financial statements retrieved from the Dutch Chamber of Commerce. When the Financial Statements only include a partial balance without a profit-and-loss account, only the first layer of the financial framework (the growth) can be calculated, preferably the growth in employees, because this may be a less volatile metric than the growth in assets. There is no information in the Financial Statements about the financiers, the investment instruments or the contractual allocation of risk and control.

However, on the website for company insights (CrunchBase) the additional information for the 2nd, 3rd and 4th layer can be found. The financiers, as well as the used investment instruments and certain contractual rights (board seat, staged financing, syndication) can be deduced for the startup. There are various ways to obtain funding: most companies start with a relatively small grant or seed capital, followed by an angel investment or a small venture capital investment, followed by venture capital investment; when the company is really growing, debt financing and private equity follow.

This chapter described the empirical results of the startups in the Netherlands, and shortly discussed the financing structure of two Dutch companies with multiple financing rounds. In the next chapter, the same empirical tests will be done for other successful countries, to be able to compare the Dutch statistical results with other countries.

4. ANALYSIS FOREIGN STARTUPS

This chapter describes the empirical results found for other foreign countries with successful startups. These countries include the United States, the United Kingdom, Germany, Israel, and Sweden. The same empirical tests will be used, although only the summarized results will be shown, because these results only serve as comparison material. The companies, as well as the investment rounds are examined. The chapter concludes with a short summary.

4.1 Selection of the countries

4.1.1 All countries

In this paragraph a few statistics will be given of all 126 countries combined. Of the total of 114,949 rounds, the rounds with a round amount of $0, missing round amount, unknown countries, or investment rounds of more than five years, were deleted.[386] Finally, 61,007 rounds remained. The average round amount was $10.1 million. A short overview of the average round amount per company per country, is given in **Figure 10**: The highest round amounts are financed by post IPO debt, post IPO equity, secondary market, and private equity. More modest amounts are debt financing and venture capital. In **Figure 11** the frequency of financing rounds is shown: The most important type of funding is venture capital, and seed capital. Angel investment and debt financing are less frequent.

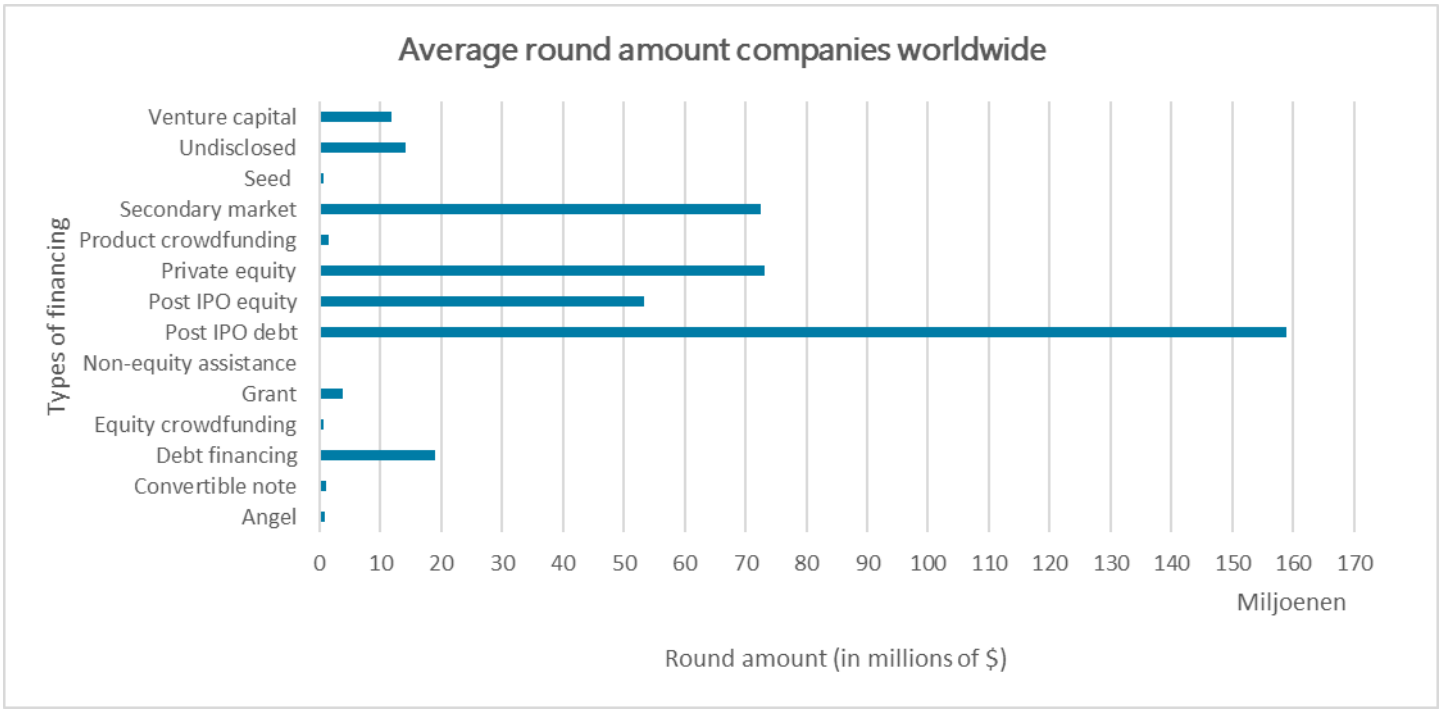


Figure 10: The average round amount of companies worldwide.

[386] Outliers were not deleted, because only an illustrative outline of the countries was meant to be given, and deleting the outliers would have required separately plotting all countries, and manually deleting all outliers for all countries. Although the outliers were deleted in the specific Dutch dataset (as well as for the separate analyses of the United States, the United Kingdom, Germany, Israel and Sweden), the aim of the analysis of these six countries differs from the indicative overview that is meant to be given of all countries worldwide, hence the different approach for deleting the outliers.

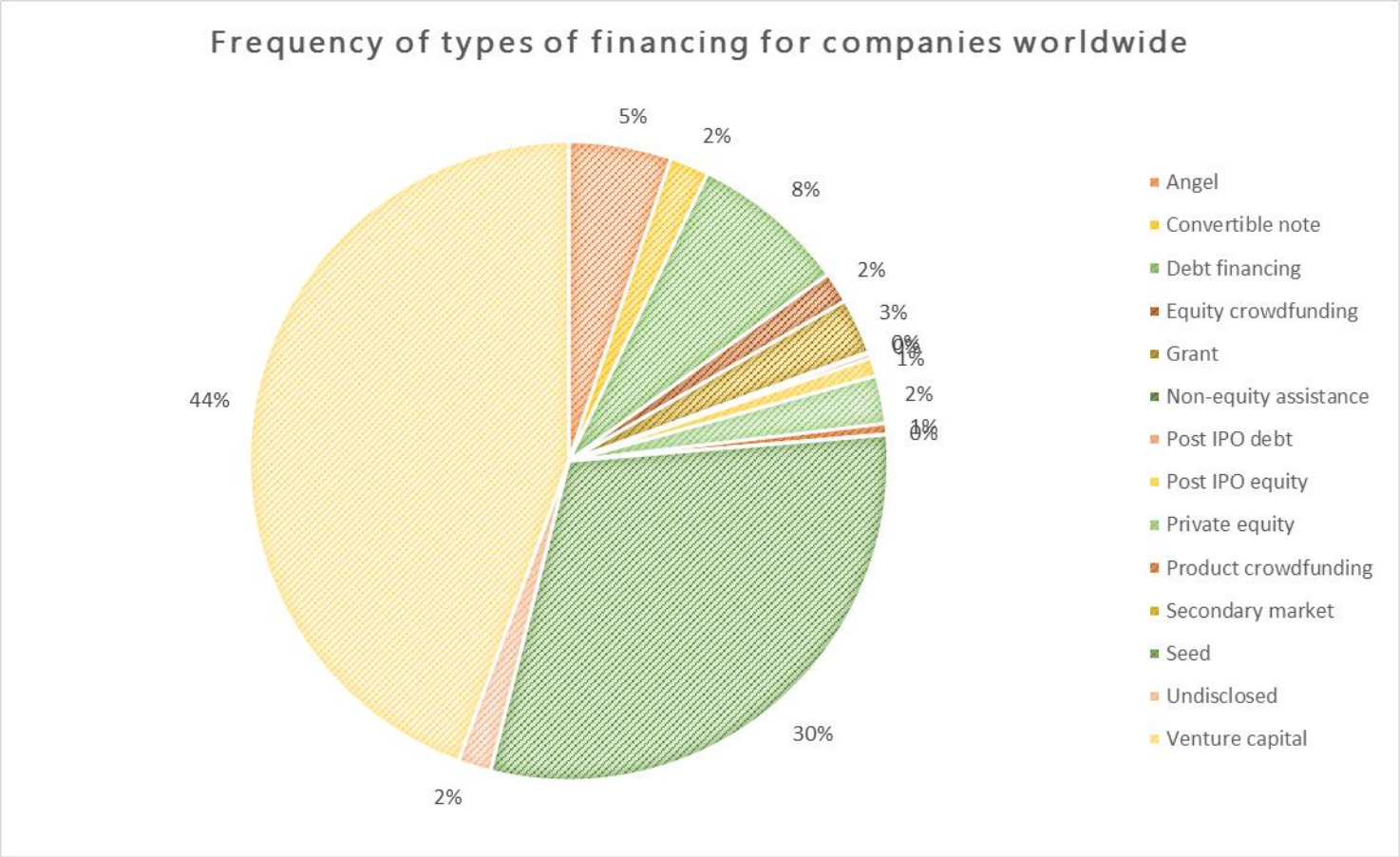


Figure 11: The frequency of types of financing for startups worldwide.

See **Annex VI** for an overview of the average round amounts of all countries with more than 50 financing rounds. The five selected countries are all included in these graphs, i.e. they have at least 50 financing rounds. The countries with a large geographical size (China, India, Russian Federation) seem to have higher round amounts.

4.1.2 The selected countries

Countries differ in the number of their startup, and the development of their ecosystems. Therefore, the a selection will be made to select five successful countries, to compare their statistics with the statistics of the Netherlands. The countries that will be examined are (see **Table 1**):

1. The United States of America, because of their no. 1 ranking in Startup Genome Countries;
2. The United Kingdom, because of their no. 2 ranking in Startup Genome Countries and the comparability with the Netherlands in terms of wealth;
3. Germany, because of their no. 5 ranking in Startup Genome Countries and the comparability with the Netherlands in terms of wealth and culture;
4. Israel, because of their no. 4 ranking in Startup Genome Countries and the comparability with the Netherlands in terms of wealth and geographical size;
5. Sweden, because of their no. 8 ranking in Startup Genome Countries and the comparability with the Netherlands in terms of wealth and inhabitants.

Note that China is not included in the analysis despite their relatively high ranking in Startup Genome Countries. This country is omitted, because of the large differences compared to the Netherlands in geographical size, culture, wealth, and government investments. Lithuania and Luxembourg were also not included, because of the limited available data.[387] See **Annex IV** for some statistics about European countries, and **Annex V** for a short demographic comparison between the selected countries.

4.1.3 Methodology

The methodology will be the same as described in Paragraph 3.1. Note, that only the most important results will be shown for these countries (in contrast to the previous chapter where the Dutch descriptive statistics and results were shown more in-depth), because the main goal is a comparison of relevant variables and numbers. However, the results for the United States will be analysed slightly more in-depth, because of the amount of observations available, which may signal certain trends or substantiate a theoretical rule or indication. All data and results are available from the author upon request.

[387] The dataset contains only 28 Lithuanian companies and 58 Lithuanian investment rounds, and 30 Luxembourgian companies and 30 Luxembourgian investment rounds.

4.2 Quantitative results United States of America

Results Companies dataset

The average total funding per American company (country code USA) is $17.7 million, with an average of 2.2 funding rounds and an average age of 8.5 years old, based on 25,444 observations.[388] With regard to the number of funding rounds, the absolute total funding significantly increases when the number of funding rounds increase (see **Figure 12**). This effect significantly decreases after the 11th financing round, indicating that more rounds are not always better with regard to the total funding achieved. See the footnote for all p-values. [389] The variable 'Total funding' (as described in **Annex I**) is an absolute number, i.e. the amounts of the separate financing rounds are not known but only the end result (the total funding) of the company is known in the Companies dataset. The unwritten rule "more financing rounds is better" is not always true, because of the described staged funding: especially when the moral hazard problems are bigger (and there is less trust in the relationship), the number of financing rounds will increase, but the amount per financing round will decrease, which is less desirable compared to a lower number of financing rounds, with a higher amount per financing round.

The hypothesis that the average total funding of startups and not-startups is the same, i.e. $6,726,930 versus $25,449,557, is rejected (t = 30.52, p = 0.000).

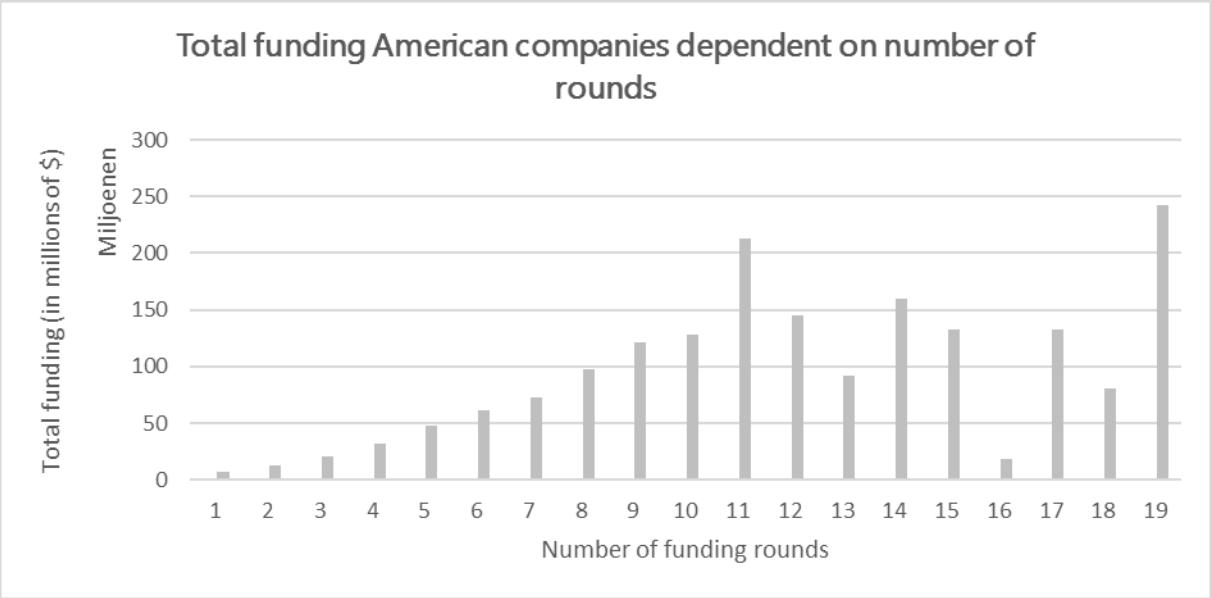


Figure 12: The total funding of American companies depending on the total number of rounds. Note that the companies with 14 or more funding rounds have less than ten observations each.

[388] In this dataset 40 outliers of $1+ billion were deleted.

[389] The average total funding of companies with 2, 3, 4 …14 financing rounds are all significantly higher than the average total funding of a company with 1 financing round (all p-values are 0.000). The average total funding of companies with 3, 4, …14 is significantly higher than the company with 2 financing rounds (p-values are 0.000); the same applies for all companies with more funding rounds than 3 (p-values are 0.000), as well as 4 (p-values are <0.001), and 5 (p-values are 0.000, with the exception of p = 0.078 for companies with 13 financing rounds). The average total funding of companies with 7 – 12 rounds is higher than the company with 6 rounds (p < 0.000, with the exception of p = 0.019 for companies with 7 financing rounds). This also applies to companies with 8-12 funding rounds having a higher total funding than a company with 7 rounds (p-values = 0.000), and 9-12 funding rounds (p<0.004).
The average total funding of companies with 11 financing rounds is higher than companies with 9, 10, 12 or 13 financing rounds (p-values = 0.000), which shows a top. The average total funding of a company with 12 funding rounds is weakly significantly higher than one with 13 funding rounds (p = 0.090). Note that the companies with more than 14 financing rounds are not included in the analysis, because these subgroups have less than ten observations each.

Results Companies startups dataset

If only the startups are examined, then the average total funding is $6.7 million, with an average of 1.8 financing rounds, and age of 3.2 years, with 10,541 observations.[390]

With regard to the status of the U.S. startup, 91% is still operating, 4% has been acquired, 4% has been closed, and less than 1% has done an IPO (see **Table 6**). The hypothesis that the average total funding of the different statuses of the startup are the same, is rejected (F = 109.92, p = 0.000). An IPO is significantly different from an operating, acquired or closed startup (p = 0.000). The closed startup is significantly different with regard to total funding compared with the operating startup (p = 0.000), and the acquired startup (p = 0.011). However, there is no significant difference between an acquired and an operating startup (p = 1.000).

With regard to the funding rounds, 80% of all U.S. startups have 1-2 funding rounds (see

Table 7). The average total funding increases statistically significantly when the financing rounds of a company increase from 1 to 2 to 3 to 4 to 5. See the footnote for the p-values.[391] The maximum number of funding rounds for an American startup was 13 funding rounds.

Table 6: The total funding of American startups depending on the status of the company

Status	Mean	Standard deviation	Frequency	Percentage
Operating	5,648,906	15,139,360	9,639	91%
IPO	44,231,623	50,733,078	48	0%
Acquired	5,627,852	10,558,496	405	4%
Closed	2,421,828	11,285,331	449	4%

Table 7: The total funding of American startups depending on the number of funding rounds

Funding rounds	Mean	Standard deviation	Frequency	Percentage
1	2,207,181	8,472,482	5,689	54%
2	5,789,757	13,351,181	2,701	26%
3	11,622,594	21,039,901	1,244	12%
4	16,701,383	24,850,907	545	5%
5	21,924,839	34,483,218	215	2%
6	23,649,163	37,828,012	90	1%
7	23,209,522	38,703,188	36	0%
8	25,147,691	27,988,001	12	0%
9	4,376,937	3,657,812	4	0%
10	24,935,532	20,207,766	3	0%
12	90,100,000	0	1	0%
13	22,058,331	0	1	0%

[390] In this dataset 32 outliers of $200+million were deleted.

[391] All companies with funding rounds of 2, 3, … 8 have a statistically significant higher total funding compared with a company with one funding round (all p-values are 0.000). This is the same for companies with 3, 4, …8 funding rounds compared with a company of 2 funding rounds (all p-values are 0.000), as well as companies with 4, 5, 6, 7 and 8 funding rounds compared with a company of 3 funding rounds (all p-values are 0.000, with the exception of p = 0.059 for the company with 8 funding rounds). Finally, the company with 5 financing rounds (p= 0.000) and 6 financing rounds (p = 0.002) are significantly different from the company with 4 financing rounds.

Results Round dataset

The average American round amount is $8.8 million, with an average age of the company of 4.2 years, based on 61,691 observations.[392] In general, most rounds (59%) are funded with venture capital, with an average amount of $10.7 million, 20% with seed capital, 10% with debt financing, and 4% with angel capital (see **Table 8**).

The round amounts per type of funding differ (F = 583.49, p = 0.000); the following comparisons are all significantly different with p-values of 0.000, unless otherwise mentioned:[393]

- Private equity is significantly higher than all other types of funding, with the exception of post IPO debt (p = 0.265).
- Post IPO financing (post IPO debt, post IPO equity, and secondary market) are significantly higher than all other types of funding except private equity.
- Debt financing is significantly higher than angel capital, convertible notes, equity crowdfunding, grants (p = 0.027), product crowdfunding (p = 0.021), and seed capital, and significantly lower than venture capital.
- Grants are significantly higher than angel capital, seed capital, equity crowdfunding (p = 0.008) and convertible notes (p = 0.016), and lower than venture capital.
- Venture capital is significantly higher than angel capital, convertible notes, equity crowdfunding, product crowdfunding and seed capital.

As is shown in **Figure 13**, the best way for an American company to acquire a funding of more than $1 million is by a grant, venture capital, debt financing, or product crowdfunding. Because the Companies startups dataset indicated that only 0.46% of all American startups did an IPO (*see* **Table 6**), and the post IPO debt, post IPO equity and secondary offerings together form just 0.8% of the total financing rounds, these forms of financing may not be the most appropriate forms of finance. However, when the startup has done an IPO, these forms are definitely recommended. Furthermore, 31 % of the angel investors do fund more than $1 million, varying from $1 million to $40 million.

[392] In this dataset 79 outliers of $500+million were deleted.

[393] Note that the "undisclosed" financing is not included in the comparisons, because this does not give specific information about what type of financing the startup should pursue.

Table 8: The American round amounts depending on the type of funding

Type of funding	Mean	Standard deviation	Frequency	Percentage
Angel capital	896,303	1,562,113	2,247	4%
Convertible note	1,564,613	6,683,003	982	2%
Debt financing	7,725,581	30,362,815	5,954	10%
Equity crowdfunding	678,523	2,335,359	562	1%
Grant	5,175,467	19,307,375	1,181	2%
Private equity	51,020,470	77,260,755	1,241	2%
Product crowdfunding	1,771,313	5,411,032	195	0%
Seed	863,910	2,461,527	12,180	20%
Undisclosed	9,150,690	35,265,449	528	1%
Venture capital	10,706,926	20,336,997	36,100	59%
Post IPO equity	40,495,296	71,182,994	355	1%
Post IPO debt	37,123,277	70,877,162	115	0%
Secondary market	64,583,683	92,689,575	21	0%
Non-equity assistance	829,676	2,718,442	30	0%

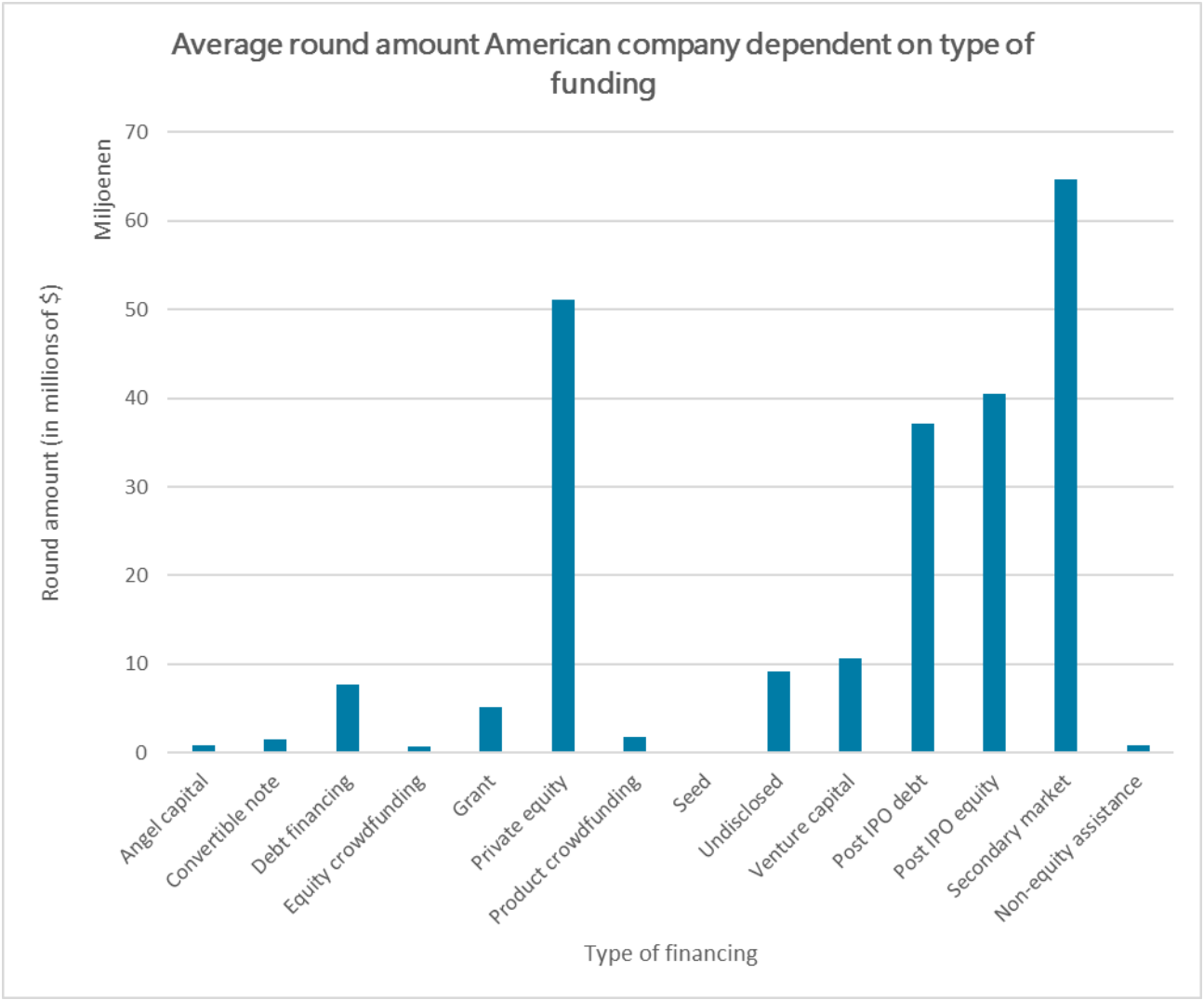


Figure 13: The average round amount of American companies depending on the financing type.

4.3 Quantitative results United Kingdom

Results Companies dataset

The average total funding per British company (country code GBR) is $8.2 million, with an average of 1.8 funding rounds and an average age of 7.3 years old, based on 2,405 observations.[394] The hypothesis that the average total funding of startups and not-startups is the same, i.e. $3,436,416 versus $12,807,648, is rejected (t = 11.52, p = 0.000).

Results Companies startups dataset

The average total funding for a British startup is $3.4 million, with an average of 1.7 funding rounds and an average age of 3 years, based on 1,188 observations. With regard to the status of the startups, 83% of the British startups have 1-2 funding rounds. The maximum number of funding rounds was 9 rounds. The average total funding amounts are not the same for the different statuses: the IPO is significantly different from the operating, acquired, and closed companies (p = 0.000). The other pairs are not significantly different (p>0.940).

Of all the startups, 94% is still operating, 1% is acquired, 5% is closed, and 0% has done an IPO (see **Table 9**).

Table 9: The total funding of British startups depending on the status of the company

Status	Mean	Standard deviation	Frequency	Percentage
Operating	3,310,410	11,869,475	1,113	94%
IPO	44,778,051	31,574,791	5	0%
Acquired	1,497,808	2,035,963	14	1%
Closed	2,734,221	11,598,003	56	5%

[394] In this dataset 15 outliers of $200+million were deleted.

Results Rounds dataset

The average round amount is $5.4 million, with an average age of 3.8 years, based on 4,999 observations.[395]

Most round amounts are funded by seed capital (31%), venture capital (41%), as well as angel capital (8%) and equity crowdfunding (5%) (see **Table 10**). The average round amount per type of funding differs ($F = 98.57$, $p = 0.000$), with the following comparisons being statistically significantly different, all p-values being 0.000, unless otherwise mentioned:

- Private equity and post IPO financing are higher than all other funding types.
- Debt financing is significantly higher than equity crowdfunding, grants, product crowdfunding ($p = 0.002$), seed capital, angel capital, and convertible notes. The average funding by debt financiers is not significantly different from venture capital ($p = 0.942$).
- Venture capital is significantly higher than equity crowdfunding, grants, product crowdfunding ($p = 0.031$), angel capital, seed capital, and convertible notes ($p = 0.001$).

As is shown in **Figure 14**, the best way for an British company to acquire a funding of more than $1 million is by venture capital, debt financing, a grant or product crowdfunding. For a company that has done an IPO, the post IPO financing is the most attractive financing. Furthermore, 22 % of the angel investors do fund more than $1 million, varying from $1 million to $27 million.

Table 10: The British round amounts depending on the type of funding

Type of funding	Mean	Standard deviation	Frequency	Percentage
Angel capital	760,853	1,584,279	379	8%
Convertible note	546,213	1,076,802	42	1%
Debt financing	12,086,483	26,248,883	92	2%
Equity crowdfunding	558,131	1,020,162	255	5%
Grant	1,045,860	2,375,521	130	3%
Private equity	29,900,570	37,310,254	97	2%
Product crowdfunding	2,109,523	7,813,148	38	1%
Seed	715,881	1,273,747	1,532	31%
Undisclosed	5,422,317	14,014,506	348	7%
Venture capital	9,025,171	14,156,365	2,051	41%
Post IPO equity	32,364,378	45,331,152	30	1%
Post IPO debt	120,000,000	0	1	0%
Secondary market	n/a	n/a	n/a	n/a
Non-equity assistance	444,006	749,234	4	0%

[395] In this dataset 14 outliers of $200+ million were deleted.

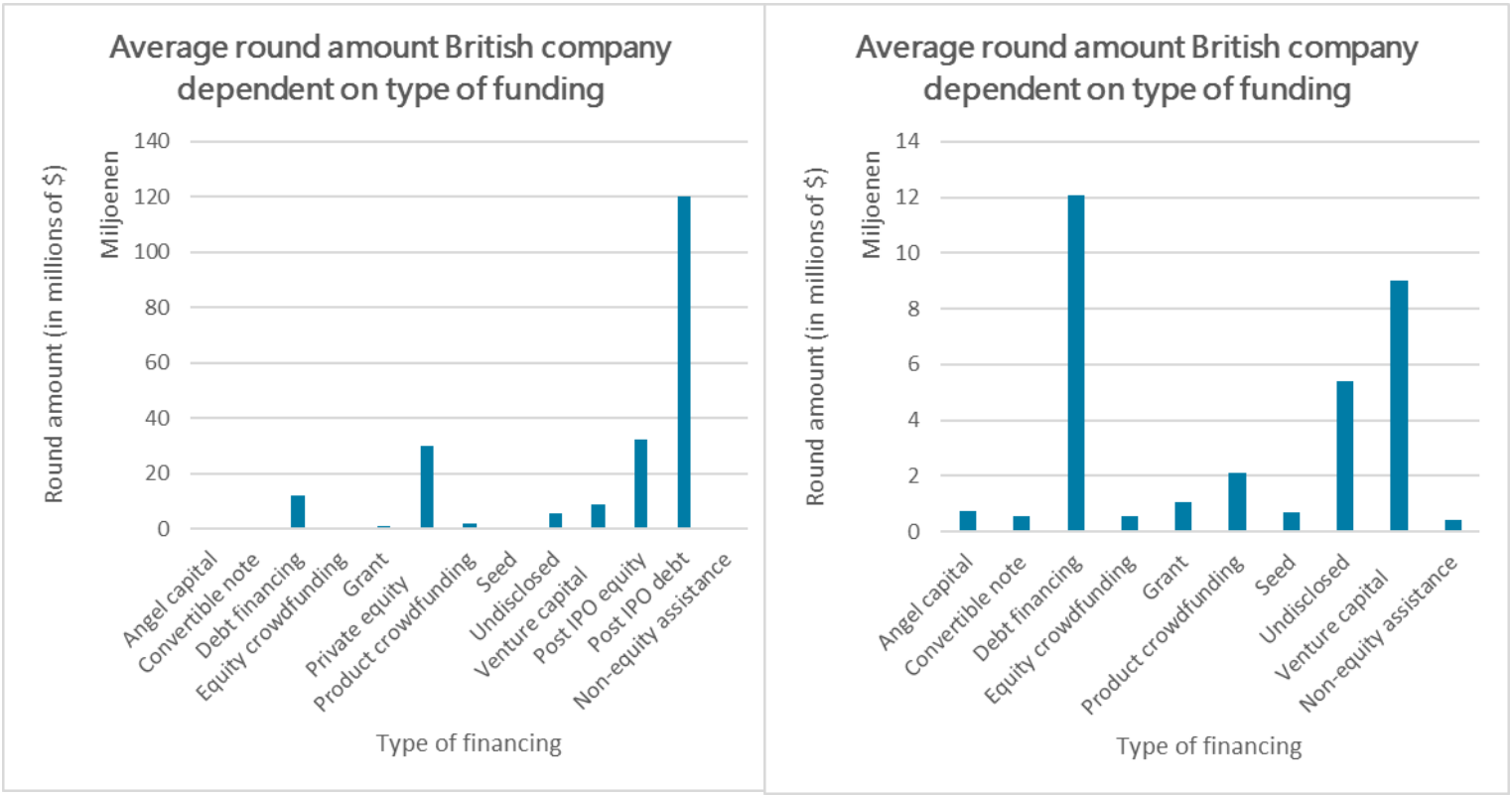


Figure 14: The average round amount of British companies depending on the financing type. Note that the private equity, post IPO debt and post IPO equity are not included in the second graph, because their high values ($30+ million) did not fit in the graph and distorted the graph.

4.4 Quantitative results Germany

Results Companies dataset

The average total funding per German company (country code DEU) is $14.7 million, with an average of 1.9 funding rounds and an average age of 7.2 years old, based on 525 observations.[396] The average total funding of startups is significantly lower than of not-startups, i.e. $9,266,870 versus $20,462,267 (t = 3.03, p = 0.003).

Results Companies startups dataset

The average total funding per German company (DEU) is $4.6 million, with an average of 1.8 funding rounds and an average age of 2.8 years old, based on 263 observations.[397] Most startups are still operating (92%), and of the remaining German startups is 2% acquired, 6% is closed, and there have been no IPOs (see **Table 11**). The average total funding of acquired German startups is higher than of closed German startups (p = 0.038), and the average total funding of acquired German startups is weakly significantly higher than operating startups (p = 0.075).

With regard to the number of funding rounds, 83% of German startups have 1-2 funding rounds, and 94% have 1-3 funding rounds. The maximum number of funding rounds is 6 rounds.

Table 11: The total funding of German startups depending on the status of the company.

Status	Mean	Standard deviation	Frequency	Percentage
Operating	4,530,470	11,596,005	243	92%
IPO	n/a	n/a	n/a	n/a
Acquired	14,985,190	20,835,700	6	2%
Closed	1,089,007	1,540,031	14	5%

[396] In this dataset 1 outlier of $500+ million was deleted.
[397] In this dataset 6 outliers of $100+ million were deleted.

Results Rounds dataset

The average German round amount is $7.8 million, with an average age of 4.0 years, based on 1,033 observations.[398]

The German round amounts are in 54% of the cases financed with venture capital (average amount of $11 million), in 30% of the cases with seed capital ($800,000), and in 6% of the cases with angel capital ($500,000) (see **Table 12**).

The average total funding amounts differ from each other (F = 20.74, p = 0.000), and the following comparisons are significantly different with p-values of 0.000, unless otherwise mentioned:

- Venture capital is significantly higher than angel capital, seed capital, and debt financing (p = 0.011), and weakly significantly higher than grants (p = 0.103).
- Debt financing is significantly higher than angel capital, convertible notes (p = 0.019), equity crowdfunding (p = 0.030), grants, product crowdfunding (p = 0.003), seed capital, and post IPO equity (p = 0.023). There is no statistically significant difference compared with the private equity total funding (p = 0.674).
- Private equity is significantly higher than angel capital, convertible notes, equity crowdfunding, grants, product crowdfunding, seed capital, venture capital, and post IPO equity.
- The post IPO debt is significantly higher than all other types of funding (with p =0.025 for debt financing), apart from private equity (p = 0.183); note that this average is based on only one observation, making the average less reliable.

As is shown in

Figure 15, the best way for a German company to acquire a funding of more than $1 million is by venture capital, debt financing, equity crowdfunding, or product crowdfunding. The post IPO equity is with $5 million relatively low, and the post IPO debt has only one observation; therefore for IPO companies the venture capital and debt financing are the best choices. Furthermore, 12 % of the angel investors do fund more than $1 million, varying from $1 million to $3 million.

Table 12: The German company round amounts depending on the type of funding

Type of funding	Mean	Standard deviation	Frequency	Percentage
Angel capital	465,601	502,029	66	6%
Convertible note	129,087	182,357	6	1%
Debt financing	29,142,070	57,704,226	12	1%
Equity crowdfunding	1,168,522	1,540,993	6	1%
Grant	718,854	1,896,613	22	2%
Private equity	41,441,319	44,873,034	18	2%
Product crowdfunding	1,665,786	2,475,279	11	1%
Seed	811,871	1,522,999	306	30%
Undisclosed	10,335,609	18,057,924	19	2%
Venture capital	11,415,395	18,628,732	556	54%
Post IPO equity	4,669,774	4,430,903	10	1%
Post IPO debt	88,205,645	0	1	0%
Secondary market	n/a	n/a	n/a	n/a

[398] In this dataset 5 outliers of $200+ million were deleted.

Non-equity assistance	n/a	n/a	n/a	n/a

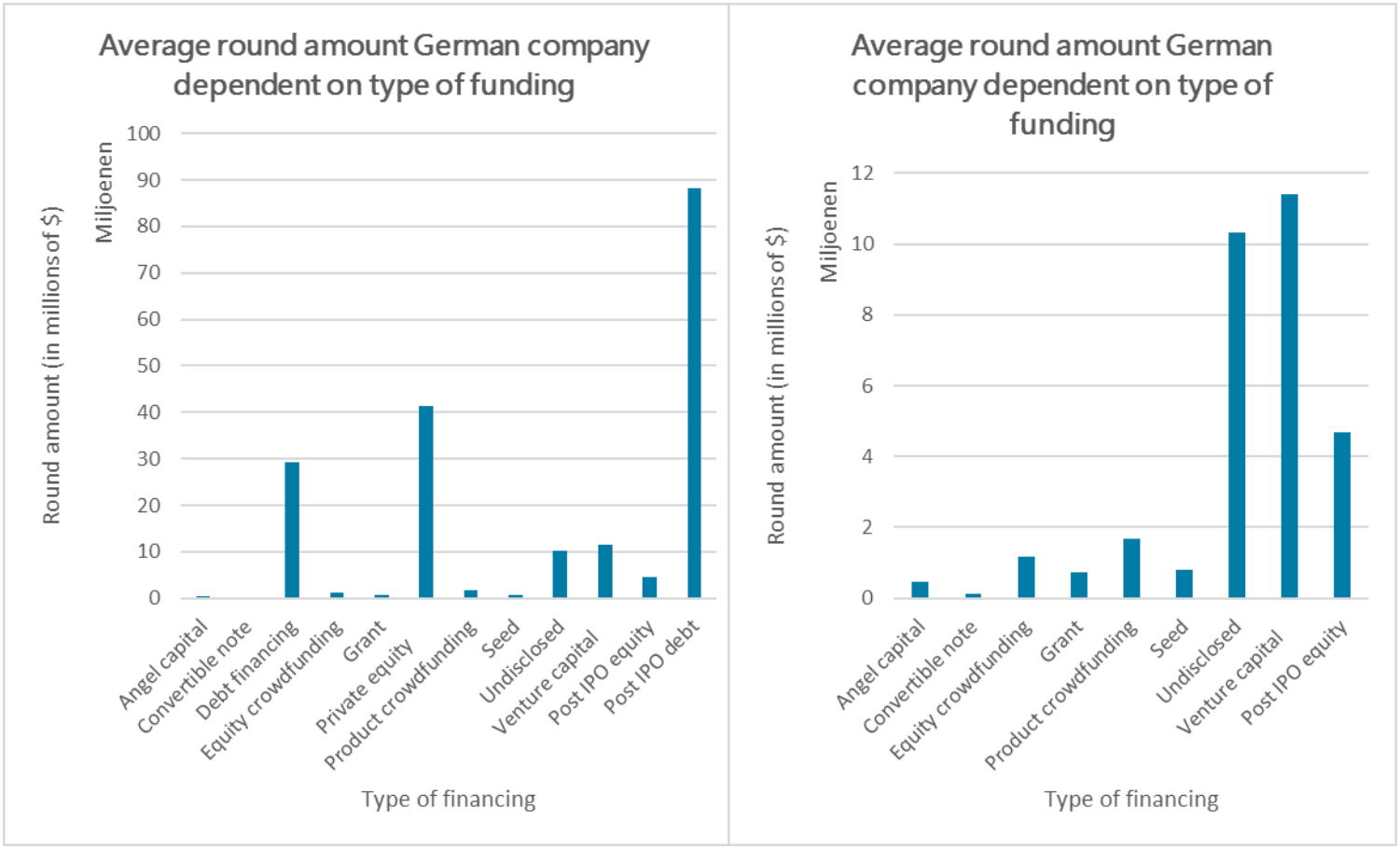


Figure 15: The average round amount of German companies depending on the financing type. Note that in the second graph the post IPO debt, private equity, and debt financing are omitted, because of their high values ($80+ million) in order not to distort the graph.

4.5 Quantitative results Israel

Results Companies dataset

The average total funding per Israeli company (country code ISR) is $9.3 million, with an average of 1.8 funding rounds and an average age of 8.0 years old, based on 695 observations.[399] The average total funding of a startup is lower than of a not-startup, i.e. $4,369,345 versus $13,223,685 (t = 7.86, p = 0.000).

Results Companies startups dataset

The average total funding per Israeli company (ISR) is $3.8 million, with an average of 1.6 funding rounds and an average age of 3.1 years old, based on 303 observations.[400] With regard to the status of the Israeli startup, 94% is still operating, 3% is closed, 2% is acquired, and 1% has done an IPO (see **Table 13**). However, the total funding depending on the status does not significantly differ between the several subgroups (p>0.245).

86% of the Israeli startups have 1-2 funding rounds; in 97% of the startups there are 1-3 funding rounds. The maximum number of funding rounds is 6 rounds.

Table 13: The total funding of Israeli startups depending on the status of the company

Status	Mean	Standard deviation	Frequency	Percentage
Operating	3,761,509	6,317,580	284	94%
IPO	8,925,000	5,904,341	2	1%
Acquired	6,385,714	6,033,152	7	2%
Closed	670,100	515,930	10	3%

[399] In this dataset 12 outliers of $100+ million were deleted.
[400] In this dataset 3 outliers of $40+ million were deleted.

Results Rounds dataset

The average round amount of all Israeli companies is $6.6 million, with an average age of the company of 4.3 years, based on 1,360 observations.[401]

With regard to the type of funding, most startups are financed by venture capital (59%), seed capital (24%) or angel capital (6%) (see **Table 14**). The average total funding per type of financier differs (F = 23.39, p = 0.000), with the following relationships being statistically significant with p-values of 0.000, unless otherwise mentioned:

- Private equity is higher than all other types of funding, with the exception of the secondary market.[402]
- Post IPO equity is higher than angel capital, grants (p = 0.110) and seed capital.
- Debt financing is higher than angel capital (p = 0.058) and seed capital (p = 0.019), but not significantly different compared with venture capital (p = 0.999).
- Venture capital is significantly higher than angel capital, grants (p = 0.110), and seed capital.

As is shown in **Figure 16**, the best way for an Israeli company to acquire a funding of more than $1 million is by debt financing, venture capital, convertible notes, or seed capital. For companies that have done an IPO, post IPO equity may be a good option. Furthermore, 36 % of the angel investors do fund more than $1 million, varying from $1 million to $30 million.

Table 14: The round amount of Israeli companies depending on the type of funding

Type of funding	Mean	Standard deviation	Frequency	Percentage
Angel capital	771,225	735,176	86	6%
Convertible note	1,471,894	1,935,355	11	1%
Debt financing	7,064,624	11,326,020	45	3%
Equity crowdfunding	766,166	659,506	6	0%
Grant	2,079,533	4,546,115	24	2%
Private equity	25,543,309	36,095,712	33	2%
Product crowdfunding	670,823	977,251	4	0%
Seed	1,048,204	1,975,351	324	24%
Undisclosed	6,306,896	9,860,724	7	1%
Venture capital	8,677,782	10,861,275	796	59%
Post IPO equity	14,345,741	13,558,501	22	2%
Post IPO debt	954,660	0	1	0%
Secondary market	12,500,000	0	1	0%
Non-equity assistance	n/a	n/a	n/a	n/a

[401] In this dataset 2 outliers of $200+million were deleted.

[402] Note that the secondary market only has one observation. All p-values of private equity are 0.000, except for product crowdfunding (p = 0.001), undisclosed funding (p = 0.001) and post IPO debt (p = 0.007). The post IPO debt will not be shown, because there is only one observation in this subgroup.

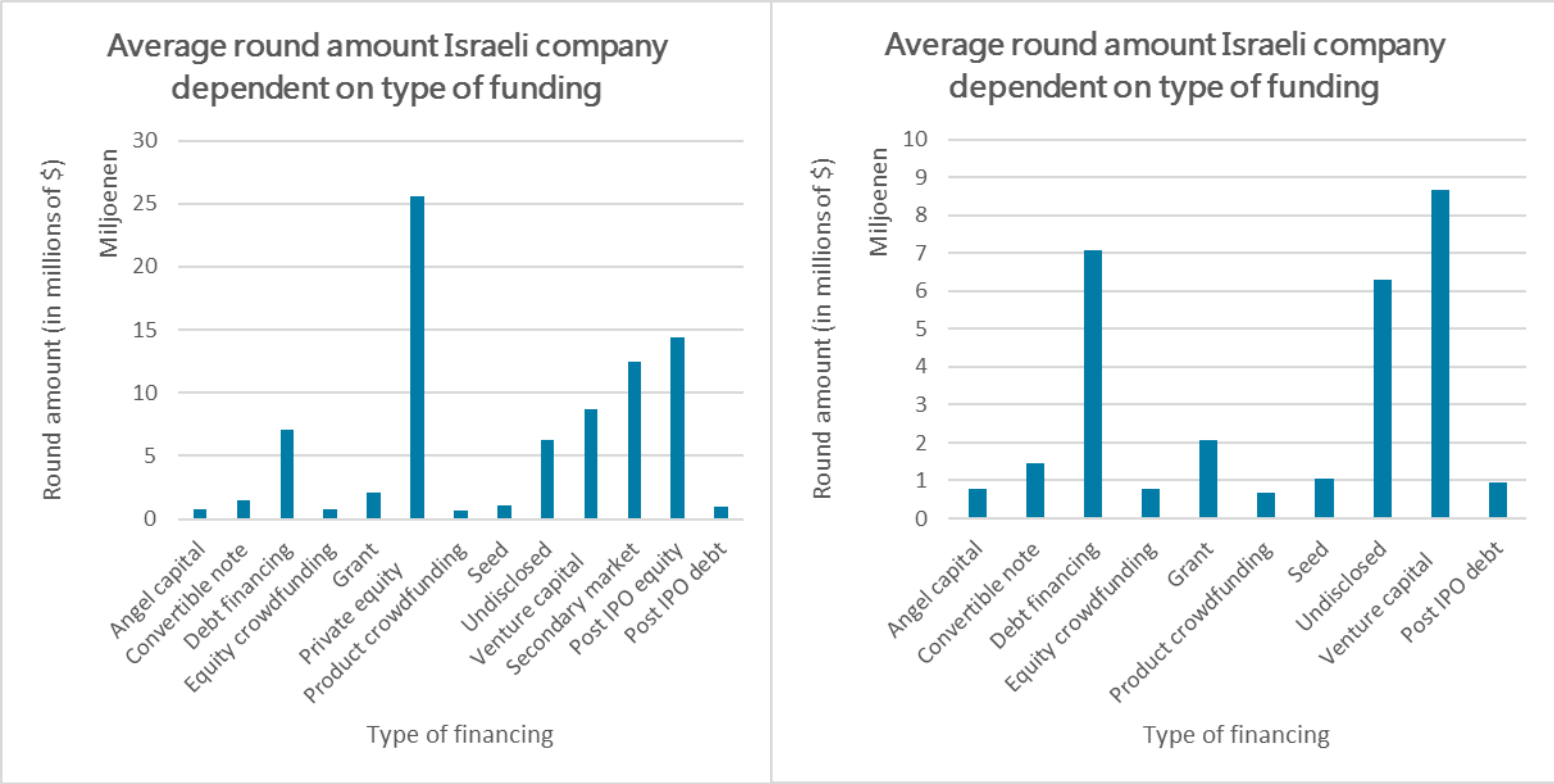


Figure 16: The average round amount for Israeli companies depending on the financing type. Note that in the second graph the private equity, secondary market, and post IPO equity are omitted, due to their high values ($25+ million) which distort the graph.

4.6 Quantitative results Sweden

Results Companies dataset

The average total funding per Swedish company (country code SWE) is $6.7 million, with an average of 1.6 funding rounds and an average age of 8 years old, based on 285 observations.[403] The average total funding of a startup compared with a not startup, i.e. $3,365,806 versus $9,183,548, is significantly different (t = 3.62, p = 0.000).

Results Companies startups dataset

The average total funding per Swedish startup is $1.6 million, with an average of 1.6 funding rounds and an average age of 3 years old, based on 115 observations.[404]

With regard to the status of the Swedish startups, 94% of the startups are operating, 6% are closed, and there are no Swedish startups in this dataset who have done an IPO or were acquired (see **Table 15**). The average total funding of an operating startup and a closed startup do not significantly differ (p = 0.402), probably due to the small subsample of closed startups

Of all the startups, 85% has 1-2 funding rounds, and 96% has 1-3 funding rounds. The maximum funding rounds is 8 rounds.

Table 15: The total funding of a Swedish startup depending on the status of the company

Status	Mean	Standard deviation	Frequency	Percentage
Operating	1,643,487	2,650,909	108	94%
IPO	n/a	n/a	n/a	n/a
Acquired	n/a	n/a	n/a	n/a
Closed	793,241	1,171,159	7	6%

[403] In this dataset 3 outliers of $200+million were deleted.
[404] In this dataset 5 outliers of $20+ million were deleted.

Results Rounds dataset

The average round amount of Swedish companies is $5.6 million, with an average age of 4.2 years, based on 553 observations.[405]

The most used funding types for rounds are seed capital (25%), venture capital (51%), and angel capital (9%) (see **Table 16**). The types of funding do differ from each other (F = 9.18, p = 0.000), with the following comparisons being statistically significant with p-values of 0.000, unless otherwise mentioned:

- Post IPO equity is significantly higher compared to angel capital, seed capital, debt financing (p = 0.100), equity crowdfunding (p = 0.047), grants (p = 0.012), product crowdfunding (p = 0.042), and venture capital (p = 0.080).
- Venture capital is significantly higher than angel capital and seed capital.
- Private equity is significantly higher compared to seed capital (p = 0.094).

As is shown in **Figure 17**, the best way for a Swedish company to acquire a funding of more than $1 million is by venture capital, grants, or debt financing. However, 23 % of the angel investors do fund more than $1 million, varying from $1 million to $5 million.

Table 16: The Swedish company round amount depending on the type of funding

Type of funding	Mean	Standard deviation	Frequency	Percentage
Angel capital	955,950	1,459,618	48	9%
Convertible note	515,000	685,893	2	0%
Debt financing	4,136,507	5,688,854	6	1%
Equity crowdfunding	310,618	212,368	4	1%
Grant	68,595	74,432	6	1%
Private equity	12,896,670	8,796,937	7	1%
Product crowdfunding	78,250	76,507	4	1%
Seed	924,234	1,540,294	141	25%
Undisclosed	3,879,600	6,020,276	49	9%
Venture capital	8,853,402	13,727,859	280	51%
Post IPO equity	21,847,952	18,461,276	6	1%
Post IPO debt	n/a	n/a	n/a	n/a
Secondary market	n/a	n/a	n/a	n/a
Non-equity assistance	n/a	n/a	n/a	n/a

[405] In this dataset 3 outliers of $200+ million were deleted.

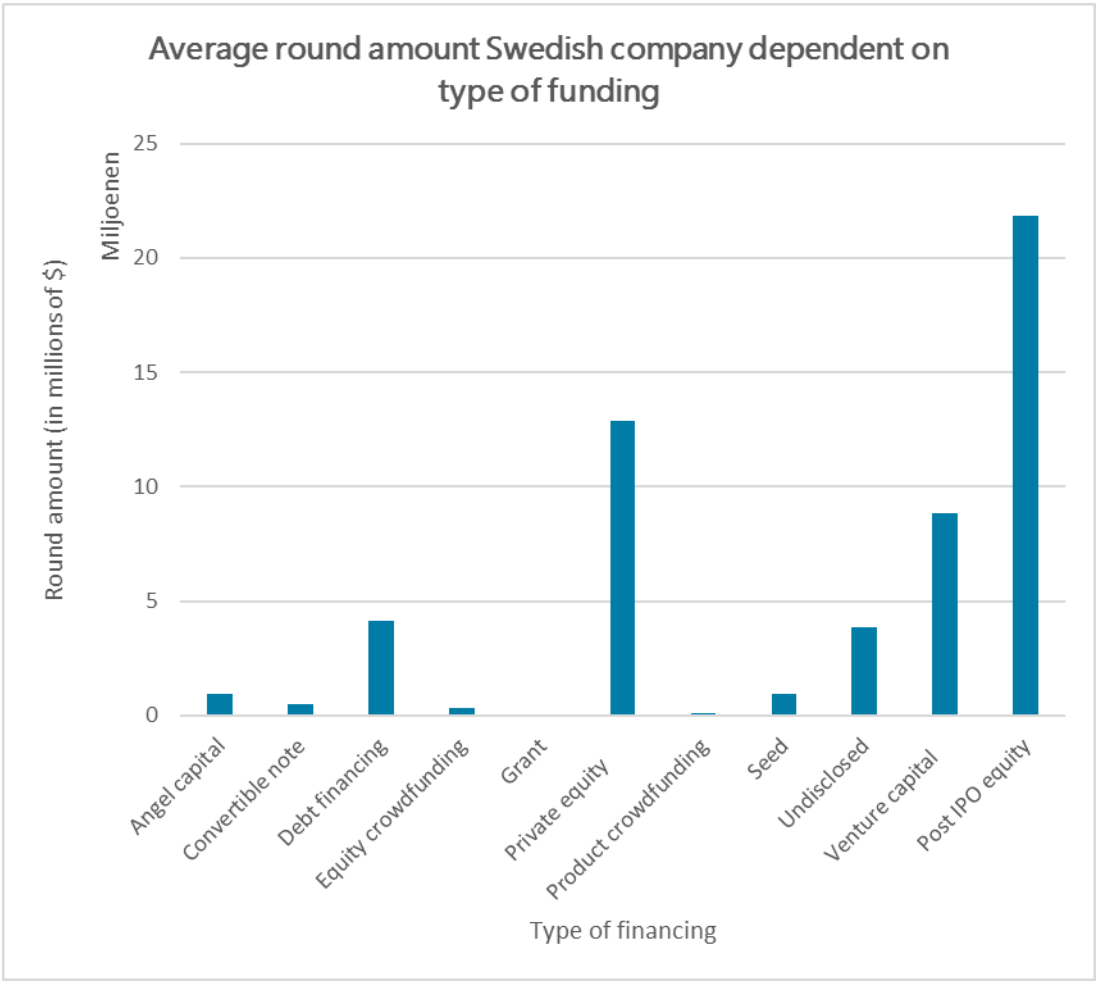


Figure 17: The average round amount of Swedish companies depending on the financing type.

4.7 Findings summarized

In this chapter five successful startup countries were investigated. The results point to various facts and relationships with regard to the company:

- The total funding of a company significantly increases when the number of rounds increase. The average total funding significantly decreases in the United States after 10+ rounds;
- The average total funding of startups is less than the average total funding of not-startups ($p<0.003$);
- Most startups have 1-2 funding rounds;
- A company with an "IPO status" has a significantly higher total funding in most countries than companies that are acquired, closed, or normally operating ($p = 0.000$);
- The vast majority of startups (90%) is still operating, 5% is acquired, 5% is closed, and often less than 1% of the startups have done an IPO.

Other facts and relationship with regard to the round amount:

- In all countries the total funding of operating companies is 1-3 times higher than the total funding of closed companies, although only the U.S. dataset gives a significant difference between the total funding of operating and closed companies ($p = 0.000$);
- Venture capitalists finance on average 50% of the round amounts, seed capitalists 30%, debt financing 10% and angel capitalists 6%;
- The best way for a company to get $1 million financing is venture capital, debt financing, sometimes a grant, convertible notes or product crowdfunding, or certain angel investors;
- The most attractive sort of financing for companies that have done an IPO, is post IPO equity, post IPO debt, or a secondary offering; these rounds fund on average up to $30 million.

When the countries worldwide are listed, there are four types of funding which stand out with regard to their round amount: the secondary market, private equity, post IPO debt and post IPO equity (which are especially appropriate types of funding for a startup that has done an IPO). However, when measured in frequency, venture capital and seed capital are far more important, and in a lesser sense, angel capital and debt financing.

A more in-depth analysis of the similarity and differences between the Netherlands and these five countries will be given in Chapter 5.

This chapter described the empirical results of startups in other successful countries. In the next chapter a more thorough analysis of the similarities and differences between the Netherlands and these five countries will be performed.

5. General analysis

This chapter briefly compares the empirical results of the Dutch startups with the foreign startups, as well as a brief comparison between the theoretical framework of Chapter 2 with the empirical results of the Dutch startups. The chapter concludes with the limitations of the research.

5.1 Comparison Dutch startups with foreign startups

When the Dutch startups are compared with the other startups, several things stand out. First of all, the total funding of Dutch startups is low compared with the total funding of other countries (see **Figure 18**). Even when the unedited amount of $2 million (see Paragraph 3.2.1) is used, there is still a huge difference. This can be explained by the fact that the United States and United Kingdom are more evolved countries, leading to more capital and therefore higher values (but not so high to become an outlier). This is affirmed by the low average total funding of Sweden, also a relatively less evolved country.

The second observation is that the average total funding is higher when the number of funding rounds are higher, or when the age of the startup is higher (see **Figure 18**). Both relationships seem logical. However, when the funding rounds per year are compared, the Netherlands score very good with an average of 1.87 funding round per year, with only Israel scoring higher (not shown).

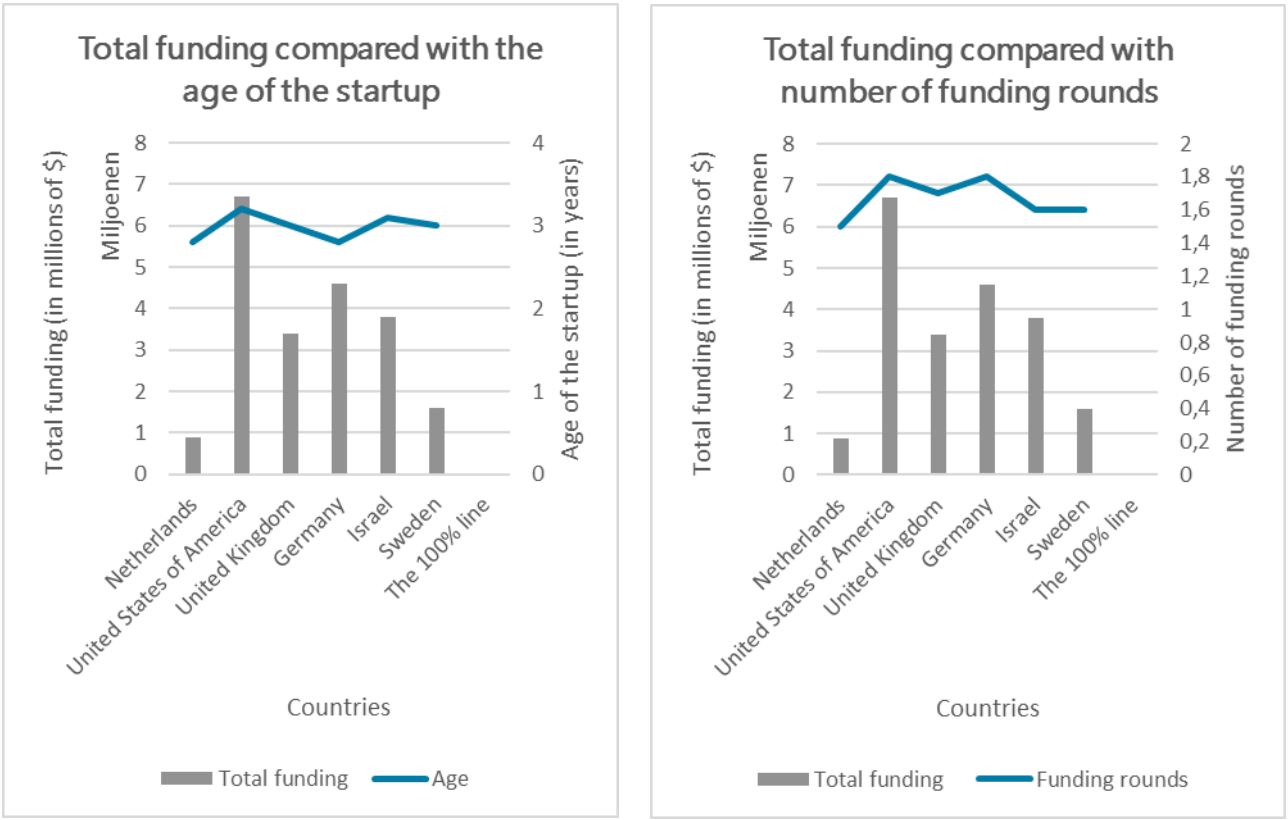


Figure 18: Total funding compared with the number of funding rounds, respectively age of the startup.

With regard to the total number of funding rounds is the Netherlands comparable with the other countries, although the United States, United Kingdom and Germany have a higher percentage of startups with 2 and 3 rounds (see **Figure 19**). It seems that the more evolved countries (United States, United Kingdom) have more funding rounds, meaning a shorter time period between funding rounds. This may signal staged funding: instead of funding a large amount at once, it is preferred to fund multiple smaller amounts, depending on the performance. However, because this relationship follows from the Companies dataset, and the Rounds dataset does not number the financing rounds, it is not possible to determine whether this relationship holds.[406] This relationship is further confirmed by Sweden (with the assumption that this country is comparable with or less evolved than the Netherlands based on the number of startups), which country has an even higher percentage of startups with a total funding consisting of only one financing round.

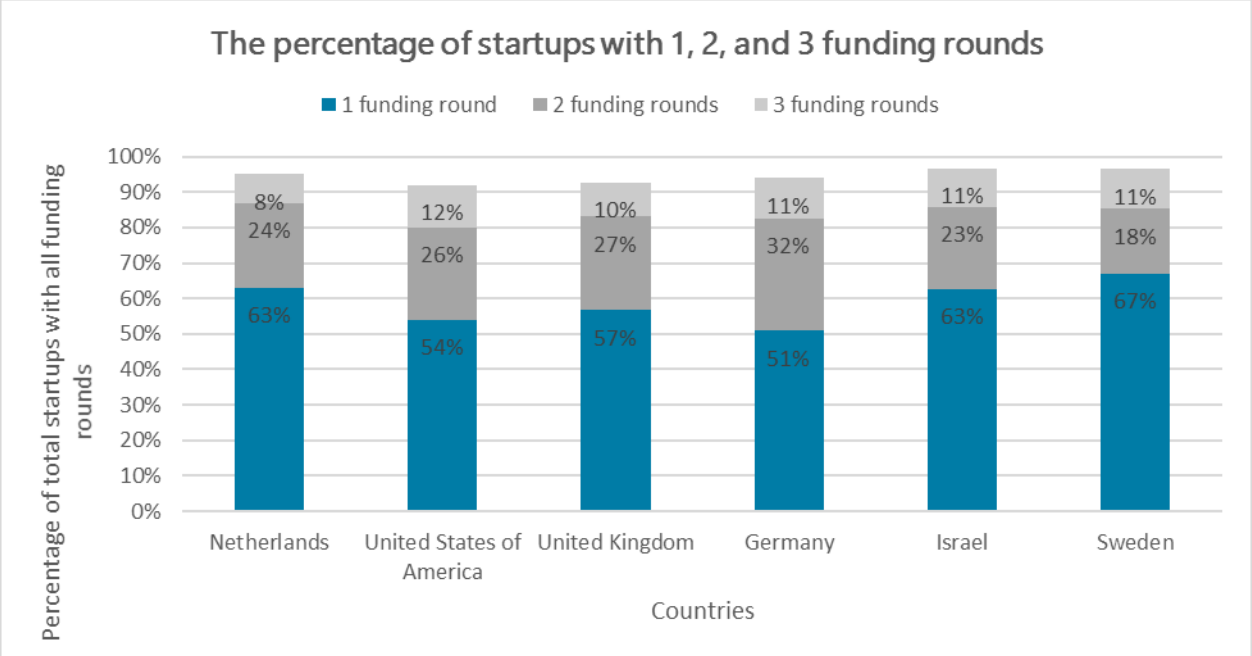


Figure 19: A comparison of startups with 1, 2 and 3 funding rounds, as a percentage of all rounds.

The results show, with regard to the type of funding, that more evolved countries use more venture capital (the United States specifically also more debt financing), and less seed capital and angel capital (**Figure 21**). In contrast to the Netherlands, where more seed capital and angel capital is used, and relatively less venture capital. This may be explained by the fact that either there is not enough venture capital available in the Netherlands, or the prospects of Dutch startups are not attractive enough for venture capitalists, making them decide not to invest in these Dutch startups. In the United Kingdom the equity crowdfunding is popular, but this is not reflected in the popularity of this funding type in other countries.

The underlying cause is overall unclear based on the dataset, but it can be hypothesized that venture capital might be seen as a proxy for more risk taking and higher possible growth prospects. This can mean that (1) the entrepreneur does not want the risk of contractual milestones and hostile voting rights and prefers the "friendlier" angel capitalist, (2) Dutch startups are not attractive enough, so the supply of Dutch startups is substandard for venture capitalists, (3) Dutch entrepreneurs (or their friends, families)

[406] Which could be done by combining the round amount with the specific financing round number.

have more capital available, and therefore have less need to obtain funding from more professional investors.

When the more evolved type of financings are investigated, especially the post IPO equity and to a lesser extent the post IPO debt, the relationship between evolved funding types and evolved countries is ambiguous (see **Figure 20**). On the one hand, all countries (and these are in general among the most successful countries) do have some of these evolved funding types, indicating a relationship. On the other hand, the United States and United Kingdom (as most evolved countries with regard to number of startups) have relatively less of these evolved types of funding compared with the other countries. However, in absolute terms the United Kingdom has a comparable amount of post IPO equity funding round amounts, and the United States has far more of these round amounts in absolute terms. It seems therefore a characteristic of an evolved startup country to have access to more advanced types of funding, in addition to the more basic ones.

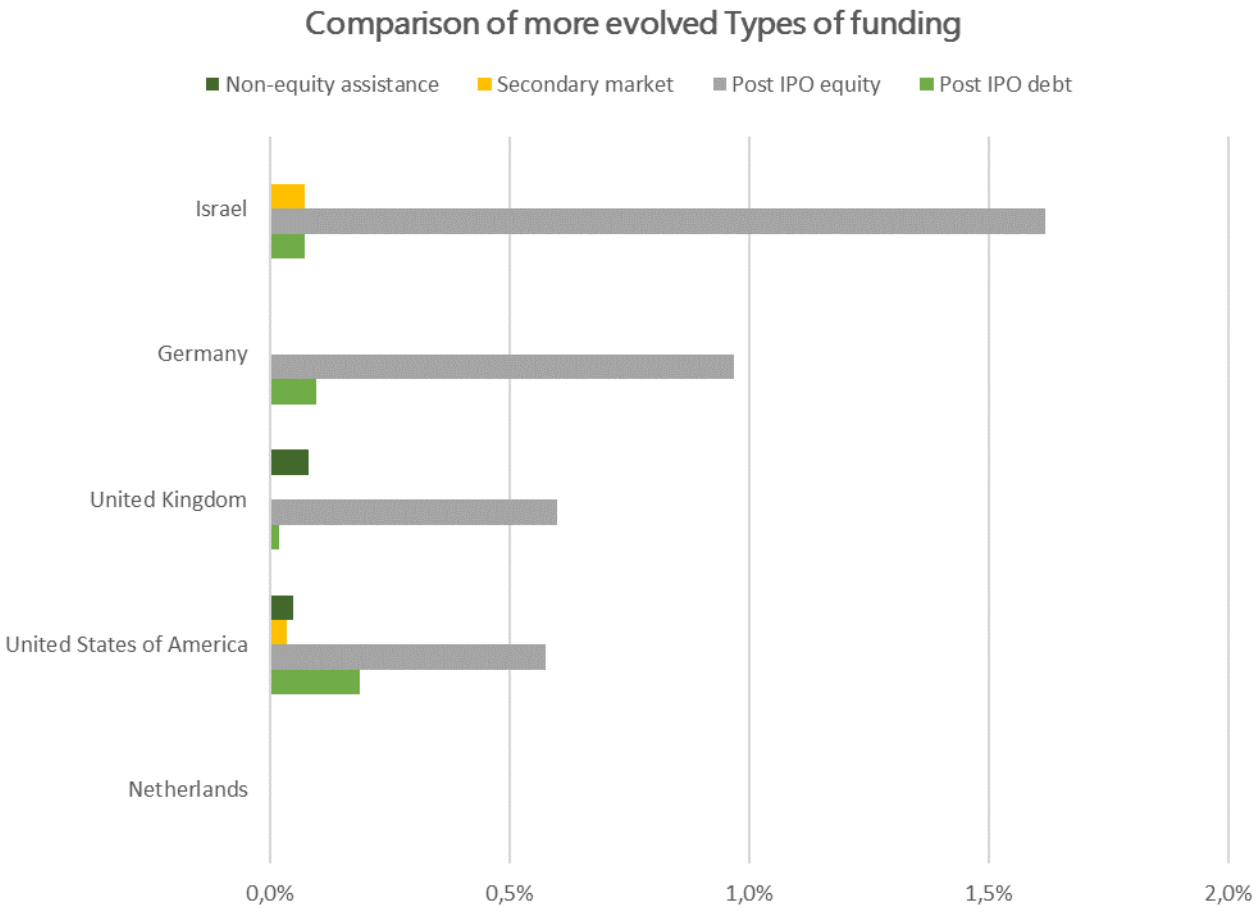


Figure 20: A comparison of the more evolved types of funding, such as post IPO equity and debt.

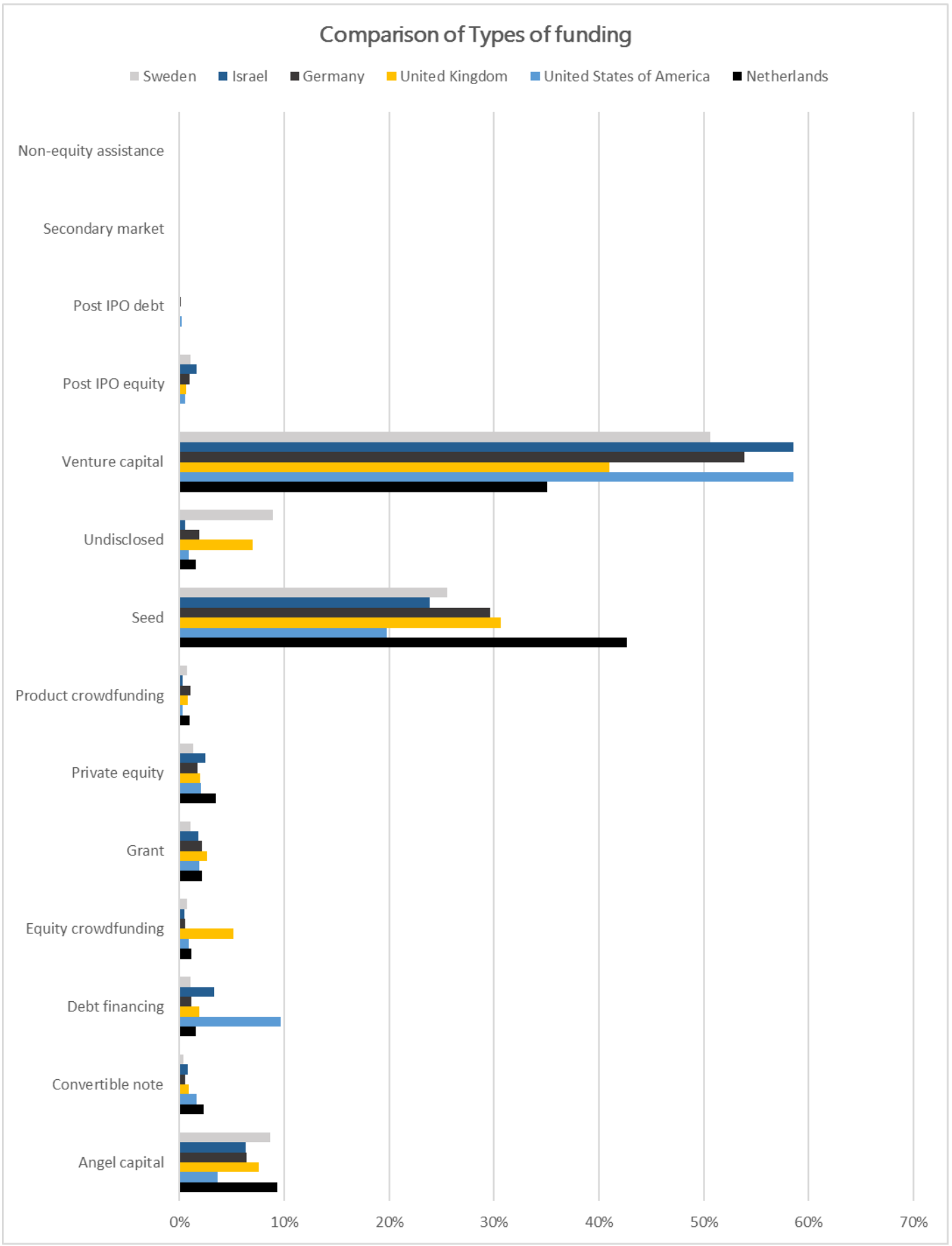


Figure 21: A comparison of the various types of funding used in the six countries.

A final comparison is the comparison between the "retention rate" of financing rounds. When the frequency of round amounts are combined with the age of the startup (see **Figure 22**), the retention rate is shown: the number of financing rounds of 2-, 3-, 4-, and 5-year old startups, compared with the number of financing rounds of a 1-year old startup. The 100% line in the graph shows the number of financing rounds of the 1-year old startup in each specific country. The graph shows that the United Kingdom and United States have a better retention rate than the Netherlands and Sweden: a better retention rate in general (the lines are above the lines of the Netherlands), as well as an initially ascending retention rate instead of descending (from 1-year old to 2-year old startups).

The difference between the relative number of rounds in year 5 in the United States (75%) and in the Netherlands (34%) is huge; the retention rate in the United States is more than twice the retention rate in the Netherlands. Although the lower average age explains part of this effect (lower average age also plays a role in the first few years, i.e. year 2 and 3), as well as the use of more staged financing, it is nevertheless proof that the Dutch startups still have room for improvement with regard to the likelihood of achieving funding in the later years of the startup.

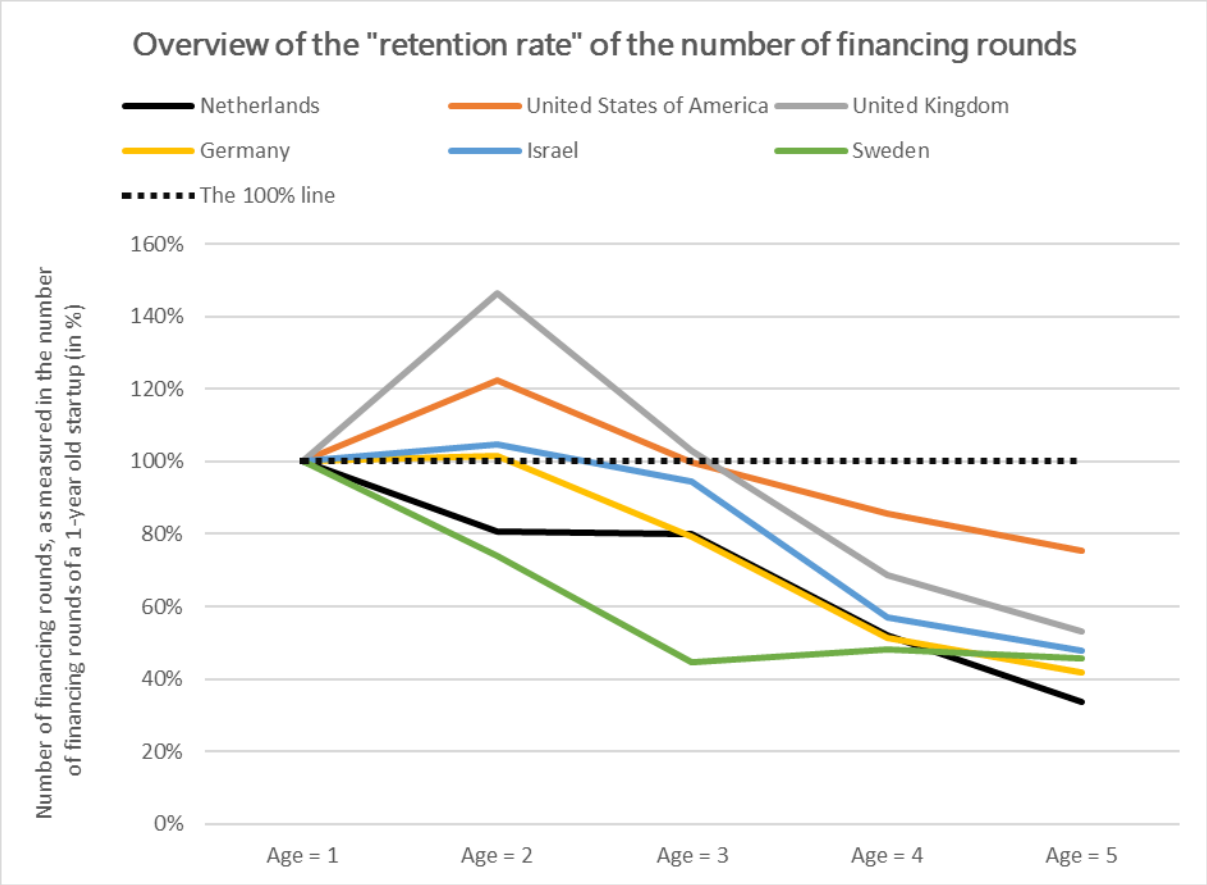


Figure 22: An overview of the number of financing rounds of 2-year old, 3-year old, 4-year old and 5-year old startups, measured as a percentage of the number of round amounts a 1-year old startup achieves. The 100% line signals the amount of rounds a 1-year old startup in each country achieves.

5.2 Comparison Dutch startups with theoretical framework

Although the empirical analysis did not provide very specific legal characteristics of Dutch startups, nevertheless, some general comparing statements can be made.

The **first layer** of the theoretical framework were the important factors for a successful startup. However, the dataset did not contain data about the personal factors (founders' team, product), external factors (political stability, competition) or the support from the financier.[407] With regard to the startup ecosystems, the six countries can be classified on the basis of the amount of their startups, and the value of their acquisitions and IPOs of their startups, on the basis of the CrunchBase dataset of December 2015. Sweden is in the activation phase, the Netherlands, Germany and Israel are between the activation phase and the globalization phase, the United Kingdom is at the upper end of the globalization phase, and the United States are in the integration phase (see **Table 17** for the underlying numbers).[408] The Startup Genome ranking in the theoretical framework reflects the extensive startup ecosystem of the US, as well as the relative ranking of the United Kingdom, Israel, Germany, and Sweden. Note that the time of writing of this thesis is 2.5 years later than this dataset, so ecosystems may have grown into a new phase.

The attraction of certain cities in a country, as predicted by the theory, is also visible in the empirical results. In the Netherlands, 52% of all startups and 53% of all financing rounds are situated in Amsterdam, while all the other cities (like Rotterdam and Eindhoven) have at most 5-6% of the startups and financing rounds (see **Figure 23** and **Figure 24**).

Table 17: Overview of the number of startups per country, and the total funding of these startups

	NLD	USA	GBR	DEU	SWE	ISR
Observations	201	10541	1188	263	115	303
Total funding >$100 million (IPO or acquired)	2	419	16	4	1	3
Total funding >$1 billion (IPO or acquired)	0	23	0	1	0	0

Note: The total funding is used as a proxy for the exit value.

The **second layer** of the theoretical framework were the parties involved in the startup, namely the entrepreneur and the financiers. The dataset did not give any information about the entrepreneur, but did give information about the financiers. As discussed in Paragraph 5.1, the Dutch startups are relatively less often financed with venture capital compared with the United States and United Kingdom, and more by angel capital and seed capital.[409] According to the theory, the venture capitalists have more ability to add value to the startup, so they are preferred. It is positive that already 35% is being financed by venture capitalists and 9% by angel investors, but in Israel and the US (the more evolved countries) this number is 50+%. Reasons why the venture capitalists do not finance more round amounts in the Netherlands may be the use of less staged financing, the preference of entrepreneurs for seed capital (more supply, less stringent conditions), the Dutch startups not being attractive or profitable enough for the venture capitalist, less competition between venture capitalists so only the best Dutch startups are financed, or some other reason. These reasons do not become clear from the empirical analysis. Because there are no growth rates in the dataset, it was not possible to determine the treatment effect of each financier, to empirically test their effectiveness in adding value to the startup.

[407] See Paragraph 2.1.1 ("Successful startup") for the theoretical framework.
[408] See Paragraph 2.1.2 ("Successful startup ecosystem") for the theoretical framework.
[409] See Paragraph 2.3 ("Incentives of financing parties") for the theoretical framework.

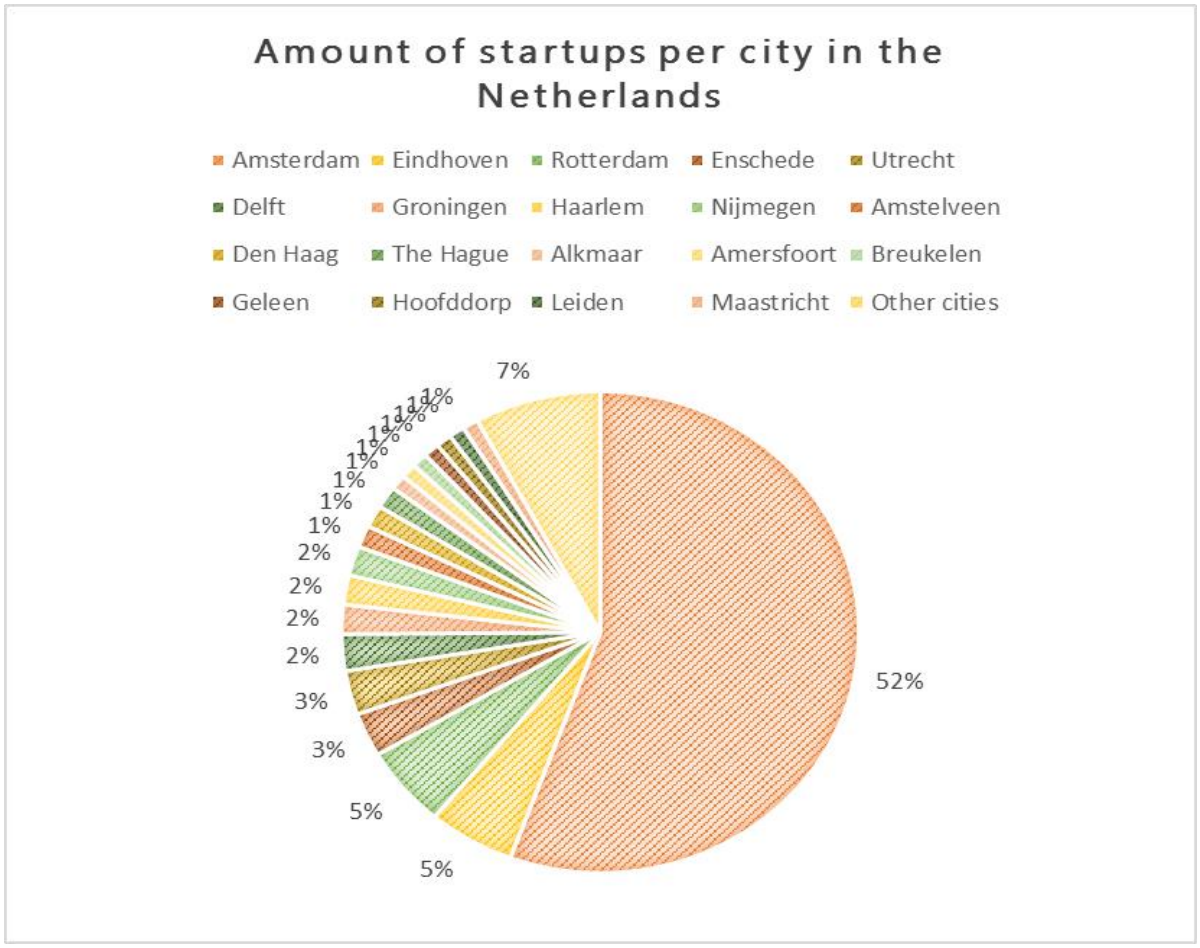


Figure 23: Amount of startups per city. All cities with one startup are included in "Other cities".

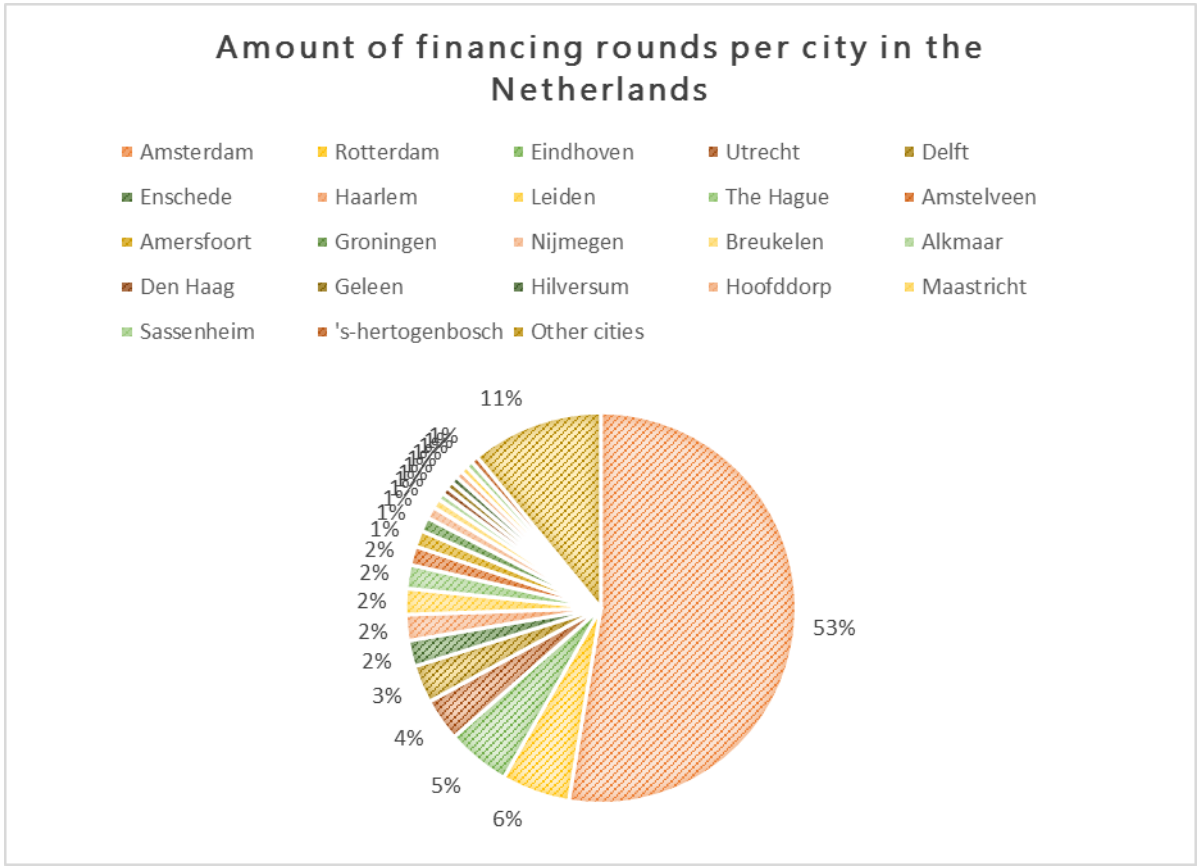


Figure 24: Amount of financing rounds depending on the city in the Netherlands. All cities with two or less financing rounds are included in the "Other cities".

Variables about how the relationship with the entrepreneur was modelled (based on trust or on contract) or whether specific factors are indeed empirically considered important by certain financiers, was not included in the dataset, and could thus not be tested.

The **third layer** is the financial structure used by the parties. So angel investors use, broadly speaking, normal equity, venture capitalists use convertible/preferred equity, and banks use debt.[410] However, the dataset does not contain data about which investment instrument is used. With the qualitative analysis, including the online information, the investment instrument may be manually found.

The **fourth layer** describes the control allocation as laid down in the financing contract between the financier and the entrepreneur. The dataset does also not contain any data about contract provisions, voting rights, or restrictive covenants. With the qualitative analysis, including the online information, the several contractual rights may be deduced from the online information about Board members and investors.

Concluding, the quantitative, empirical analysis confirms the status of a startup ecosystem based on the exits, and the attraction effect of ecosystems (part of the 1st layer), the use of more venture capital and less angel capital and seed capital in the more evolved ecosystems (2nd layer). The qualitative analysis, although it is only indicative, confirms the use of convertible securities by venture capitalists (part of the 3rd layer) as well as the use of several contractual control allocations by means of Board seats, staged financing, and syndication (4th layer).

5.3 Limitations of the research

There are various limitations to the study performed. The first limitation is the dataset of CrunchBase: because CrunchBase is based in the United States, it is likely that more U.S. companies and financing rounds were included compared to other countries. More than sixty percent of the financing rounds are observations from the United States, and almost seventy percent of all investments are done by American investors.[411] This may indicate a form of sample selection bias. Overrepresentation of the United States, and underrepresentation of the other countries, may therefore be present. Another limitation may be survivorship bias: although the companies can hold the status "closed", there is still the possibility that more successful and famous startups are included in the dataset more often than less successful and lesser known startups. And it seems that there are relatively more startups included than not-startups (i.e. companies older than five years); because the research was based on startups, this limitation may be less severe.

Furthermore, not all the assumptions are fully met for all datasets, which may lead to weaker results. Furthermore, not all subsamples meet the "requirement" of at least thirty observations. In addition, the number of variables in the datasets were limited: a variable for for example risk allocation, voting rights, and contractual terms was missing, meaning that although the statistical results do shed some light on the question of the optimal capital structure for Dutch startups, several questions stay unanswered. Another limitation, is that the relationships as defined in Chapter 5 may be ambiguous, because two or more causes all have effect on one depending variable, making it hard to specify whether there is an individual effect as well as the size of this effect. An example is the fact that the Netherlands have fewer absolute funding rounds: this is probably the result of the lower average age of Dutch startups, as well

[410] See Paragraph 2.3.1, 2.3.2 and 2.3.3 ("Financier", and more specifically "Relationship with the entrepreneur") for the theoretical framework.

[411] The tab "Investments CrunchBase" in the CrunchBase dataset has 137,709 investments in total, of which 96,342 investments by investors with the USA country code.

as being less evolved as a country as a whole (as appears from the use of the various funding types). So the end effect has to be separated into the separate effects.[412]

Finally, this study was performed with all startups in the dataset, depending on the round amount and total funding. Although the round amount and total funding say something about the valuation of the investors, and therefore the growth prospects of the startup, there was no explicit growth rate included in the dataset. Therefore no explicit distinction could be made between "normal" startups and "high growth" startup.

See Chapter 6 for further recommendations for future research.

[412] This may be done by using a regression analysis, to measure the effect separately.

6. CONCLUSION

In this thesis the following research question was analysed:

"How can the allocation of control in the financing structure (as laid down in the contract with the financier) of Dutch high-growth startups be improved?"

In **Chapter 1** the relevance of successful startups was described. Startups lead to more innovation, more employment, and more economic growth, provided that these startups are opportunity-based and focus on growth. Not all startups are the same, and a lot of startups are necessity-based, without pursuing an innovative or refreshing idea. This thesis was written in order to further support and advance the Dutch ecosystem and advise high-growth startups on how to acquire sufficient funding, so the aforementioned economic benefits can be achieved. This thesis' goal is to investigate a specific part of the ball of tangled wool that is called a successful startup (and consists of hundreds of variables), namely the financing structure, and more specifically the control allocation in this financing structure.

In **Chapter 2** a theoretical pyramid based on the legal and financial literature was drafted, namely (1) a successful high-growth startup (2) that seeks the optimal financier for high growth (3) with the optimal investment instrument (4) optimally laid down in the investment contract.

The first layer consisted of a description of factors that are important for a successful startup. A startup is defined as successful when it generates economic prosperity and employment. High-growth startups contribute the most to these goals. The growth is measured by means of the market value and sales. Because a thriving startup ecosystem leads to more successful startups, it is important to further develop such ecosystems.

The second layer are the involved parties, namely the entrepreneur and the four financiers. The entrepreneur is the driving force behind the startup, and his ideas and vision are essential. Because he is mainly incentivized by financial gains, several conflicts may occur between the entrepreneur and the financiers, including information asymmetry, adverse selection and moral hazard. To mitigate these problems, each of the financiers has his own approach: The angel investor primarily uses his trust relationship with the entrepreneur to mitigate these problems, the venture capitalist uses contractual control rights, the bank uses restrictive covenants, and the government uses monitoring and covenants. The angel investor and venture capitalist are the first-best financiers, because they have the ability to add value to the startup, by means of coaching and management experience. The best way to achieve a jumpstart in the growth of the startup, is to obtain venture capital from an experienced independent venture capital fund. There are several factors that venture capitalists consider important, including strong growth expectations, modern industries, and a strong founders' team.

The third layer is the financial structure used by the parties. According to the principal agent theory and venture capital theory, both the entrepreneur and the financier should be incentivized to exert their best efforts. This may be done by using convertible (preferred) equity for the financier with prearranged performance thresholds for the entrepreneur, and majority common equity for the entrepreneur to stay incentivized. If the entrepreneur does not achieve the performance thresholds, the financier can exercise his control rights, and take control over the startup. To achieve the long-term growth of the startup, it is important to set performance milestones in line with the long-term growth of the firm, although these milestone can be broken down into smaller goals.

The fourth layer is the risk and control allocation as laid down in the financing contract between the financier and the entrepreneur and his startup. Contract provisions include the type of investment instrument, voting rights and board seats, and restrictive covenants. Each of these provisions may

allocate more or less risk and control to the parties. The positive voting rights and the negative covenants may substitute each other, while the voting majority and board majority complement each other.

In **Chapter 3** this theoretical framework was supplemented with an empirical analysis of the Netherlands. The quantitative analysis was done on the basis of the CrunchBase startup dataset, with observations ranging from 01/01/1960 until 04/12/2015. A general analysis of all Dutch companies was performed, subsequently narrowed down to Dutch startups (all companies of 5 years and younger), followed by the analysis of the round amounts of all Dutch companies. The results of the Companies dataset showed that the average total funding per Dutch company is $7.5 million. The startup and not-startup are significantly different with regard to their average total funding: $2 million versus $16 million. Of all Dutch startups, 66% had achieved only one funding round and 24% had achieved two funding rounds. With regard to the status of the startups, 96% is still operating, and 4% of the startups have been closed; just 1 startup out of the 201 Dutch startups has been acquired, and 0 startups have done an IPO.

The results of the Rounds dataset showed that 43% of all financing round amounts of Dutch startups were seed capital (average round amount of $400,000), 35% was venture capital (average round amount of $10.5 million), and 9% was angel capital (average round amount of $650,000). The average venture capital investment amount differs significantly from seed capital and angel capital, and private equity, with an average amount of $40+ million, differs significantly from all other types of capital.

Subsequently, a brief qualitative analysis was done on the basis of some financial statements retrieved from the Dutch Chamber of Commerce, to collect legal information. Unfortunately, the information in the financial statements was not sufficient to determine the investment instruments. The balance sheet may be used for the computation of the employee growth rates, and, as result, the distinction between high-growth startups and normal startups. Additional legal information was available on the business insights website of CrunchBase, and this information confirmed the theoretical framework: companies start with a relatively small grant or seed capital, followed by an angel investment or a small venture capital investment, which in turn is followed by a venture capital investment; when the company has become mature, debt financing and private equity follow. Venture capitalists use, in exchange for their investment, several contractual terms in order to control the return on their investment, namely staged financing (based on performance milestones), syndication, and a board seat.

In **Chapter 4** the empirical results of five successful countries were shown, which were the United States of America, the United Kingdom, Germany, Israel and Sweden. Although the following facts and relationships may not be directly applied to the Netherlands, because of the differing demographics, they are nevertheless useful for a comparison:

- The total funding of a company significantly increases when the number of rounds increase. The average total funding significantly decreases in the United States after 10+ rounds;
- The average total funding of startups is significantly less than the average total funding of not-startups;
- Most startups have 1-2 funding rounds;
- A company with an "IPO status" has in most countries a significantly higher total funding than companies that are acquired, closed, or normally operating;
- The vast majority of startups (90%) is still operating, 5% is acquired, 5% is closed, and often less than 1% of the startups have done an IPO.

Other facts and relationship with regard to the round amount acquired by the startup are:

- Venture capitalists finance on average 50% of the round amounts, seed capitalists 30%, debt financing 10% and angel capitalists 6%;

- The total funding of operating companies is in all countries 1-3 times higher than the total funding of closed companies, although this difference is only significant in the U.S. dataset;
- The best way for a company to get $1 million financing is venture capital, debt financing, sometimes a grant, convertible notes or product crowdfunding, or certain angel investors;
- The most attractive sort of financing for companies that have done an IPO, is post IPO equity, post IPO debt, or a secondary offering; these rounds fund on average up to $30 million.

When in **Chapter 5** the Dutch startups are empirically compared with the startups of more evolved countries (such as the United States and United Kingdom), it becomes clear that the Dutch startups are less evolved with regard to the average age of startups (2.8 versus 3.0) and the number of funding rounds (1.5 versus 1.7) compared to these evolved countries. Because of the lower values of these two variables, the total funding achieved by Dutch startups also becomes lower.

The second important relationship is related to the number of funding rounds: only 52% of the startups in the United States and United Kingdom have only one financing round, compared with 63% in the Netherlands. The United States, United Kingdom, Germany and Israel have on average 38% of their startups in the category "2 or 3 financing rounds", compared with 32% of the Dutch startups. The absolute higher number of funding rounds in evolved countries as well as the higher amount in "2 or 3 financing rounds" may be explained by the use of more staged financing, but also by other factors such as higher growth (leading to a higher need for financing), or more attractive investment prospects. However, part of it is explained by the fact that the average age of Dutch startups is lower; therefore, the Dutch startups have "less time" to achieve more financing rounds. On the other hand, the Dutch funding rounds per year (1.87 versus 1.78 average) are promising.

A third relationship is that the more evolved countries substitute seed capital and angel capital with venture capital, whereas the Netherlands follow the opposite pattern. The underlying cause is overall unclear based on the dataset, but it can be hypothesized that venture capital might be seen as a proxy for more risk taking and higher possible growth prospects. This could be explained as a signal that (1) entrepreneurs do not want the risk of contractual milestones and hostile voting rights and prefer the "friendlier" angel capitalist, (2) Dutch startups are not attractive enough for venture capitalists, (3) Dutch entrepreneurs (or their friends, families) have more capital available, and therefore the entrepreneur need limited funding from professional investors.

A final striking point is the high retention rate (the number of financing rounds of 2-year, 3-year, 4-year and 5-year old startups as compared to the number of financing rounds of 1-year old startups) of the United States and United Kingdom. The general retention rates are two times as high as the Dutch retention rate, meaning that 5-year old startups in these evolved countries still achieve a significant number of financing rounds as compared with 1-year old startups. It is important that startups have access to ample financing. Further researches might be required, to better investigate the underlying factors for the height of this retention rate. Possible explanations of this include, for example, the average age of the startup, the height of the amount financed, whether it is collected from different financiers or not, and whether the growth varies for these 1-year old versus 5-year old startups.

In the second half of Chapter 5, the Dutch empirical results were compared with the theoretical framework. The empirical analysis confirmed part of the first layer: the phase of an ecosystem can be empirically based on the number of high exits, with the Netherlands (at the End of 2015) being in between the activation phase and the globalization phase. Another aspect of the first layer was the empirical confirmation of the attraction effect of certain cities with a country, with Amsterdam attracting more than 50% of all Dutch startups and financing rounds, with the no. 2 and 3 city only attracting 5-6% of the startups and financing rounds. Apart from the first layer, the empirical analysis also confirmed the theory of the second layer: in the more evolved ecosystems (United States, Israel) more venture

capital is used, and less angel capital and seed capital. Depending on the degree of development, as measured in high exits and number of startups, the theoretically optimal capital is used more often.

To directly answer **the research question**, the allocation of control in the financing structure of Dutch high-growth startup can be improved by using convertible equity, while giving the entrepreneur an equity majority. To align the incentives of the entrepreneur and the financier, the monitoring by means of a board seat and staged financing can be used. When the entrepreneur's efforts have been successful, a win-win situation is created, where the venture capitalist can exit his investment with a high return, and the entrepreneur regains control over the company. And a high exit (especially an IPO) also contributes to the startup ecosystem, making it a triple win.

However, before the venture capitalist and the entrepreneur sign the financing contract, there has to be an agreement about how much control and future profit the entrepreneur has to trade in exchange for the financing and value-adding capacities of the venture capitalist. It is crucial that both parties become aware of the mutual interest, i.e. the entrepreneur acknowledges that a venture capitalist is better for a strong growth of the startup, while the venture capitalist aligns the interests by not only acting for his short-term profit and returns, but also in ensuring a financially healthy company.

Further research is recommended, to shed light on which financiers and investments instruments are valuable and helpful for the startup, and which are not, as well as research to the specifically used legal contractual terms in Dutch financing contracts. Quantitative and qualitative legal research complement each other, with the first identifying certain relationships and effects, and the second supplying the essential theory to explain these empirical findings.

There are numerous **recommendations for future research**. The most important one is the addition of more legal variables to the dataset, on the basis of questionnaires or in-depth interviews. The recommendation is to gather data about (or determine a proxy for) legal variables such as investment instruments (preferred equity, convertible equity, preferred debt, etc.) and contractual elements (voting rights, Board rights, performance milestones, number of contractual covenants, etc.). The second recommendation is to make a distinction between high growth startups, and "average performing" startups, by adding the yearly growth rates (growth in market value, assets, or sales) to the dataset and selecting the Dutch startups with growth rates in the top percent of their country or industry. A third recommendation is to include information from various sources, such as industry background, cultural differences, and the (aftermath of) economic prosperity or downturn. Last but not least, the Company dataset should be linked with the Round dataset, so the specific round amount can be linked to the age of the startup, to determine whether the round amount is depending on the age of the startup. And linking the datasets can lead to more accurate information and therefore a greater chance on more accurate relationships and eye-openers.

The legal recommendation for Dutch entrepreneurs is to be advised by a lawyer before starting the negotiations, in order to have a clear view what to expect from the financier, and what rights should be given up in return for the support of the financier. Building a good team and having a marketable product as soon as possible are also valuable factors for acquiring funding. See for the specific factors per financier Paragraph 2.3.2-2.3.5.

The legal recommendation for the Dutch government is to facilitate the use of more evolved securities, like the post IPO equity and post IPO debt, as well as secondary offerings. As discussed, the Dutch startups have (almost) no experience with any of these securities, which is a missed opportunity to further develop the Dutch startup ecosystem from a financial perspective. Another recommendation is to optimize the tax system for high-growth startups. Therefore, instead of providing tax breaks for everyone starting a new business, the resource should focalize on rewarding potentially high-growth startups. The

recommendation is therefore to abolish the general deduction of €6000+ for starting entrepreneurs (as laid down in Article 3.76 paragraph 3 Dutch Income Tax Act 2001) and use this money to subsidize innovative ideas or offer grants. In this way, taxpayer's money is going to be better invested by supporting those innovative ideas, since they have a larger positive economic footprint on the community both in term of employment and GDP.

A recommendation, or idea, for the legal world, is to participate in the upward potential of the startup, by providing advice in exchange for a small percentage of equity in the startup. Apart from building a legal network and acquiring potential clients, lawyers will benefit from cross-fertilization between their legal knowledge and startups' innovative ideas.

REFERENCES

Akerlof, G.A., 'The Market for "Lemons": Quality Uncertainty and the Market Mechanism"', *The Quarterly Journal of Economics,* Vol. 84, No. 3, August 1970, pp. 488-500.

Angel Capital Association, 'Angel investment in the U.S. – Trends & best practices', *Angelcapitalassociaton.org* 26 September 2016.

Anokhin, S. & Wincent, J., 'Start-up rates and innovation: A cross-country examination', *Journal of International Business Studies* 2012, 43, pp. 41-60.

Arthur, W.B., 'Competing Technologies, Increasing Returns, and Lock-In by Historical Events', *The Economic Journal*, Vol. 99, No. 394, March 1989, pp. 116-131.

Basel Committee on Banking Supervision, 'Press release: Group of Governors and Heads of Supervision announces higher global minimum capital standards', *Bis.org* 12 September 2010 (date retrieved: 24 May 2018).

Baum, J.A.C. & Silverman, B.S., 'Picking winners or building them? Alliance, intellectual, and human capital as selection criteria in venture financing and performance of biotechnology startups', *Journal of Business Venturing* 19, 2004, pp. 411-436.

Baumol, W., *Welfare Economics and the Theory of the State*, Cambridge MA: Harvard University Press 1952.

Bengtsson, O. & Wang, F., 'What Matters in Venture Capital? Evidence from Entrepreneurs' Stated Preferences', *Financial Management* Winter 2010, pp. 1367-1401.

Bengtsson, O., 'Covenants in Venture Capital Contracts', *Management Science,* Vol. 57, No. 11, November 2011, pp. 1926-1943.

Berger, A.N. & Black, L.K., 'Bank size, lending technologies, and small business finance', *Journal of Banking & Finance* 35, 2011, pp. 724-735.

Berger, A.N. & Udell, G.F., 'A more complete conceptual framework for SME finance', *Journal of Banking & Finance* 30, 2006, pp. 2945-2966.

Berger, T., Chen, C. & Frey, C.B., 'Drivers of disruption? Estimating the Uber Effect', *Oxford Martin School Working Paper*, 23 January 2017.

Berglöf, E., 'A Control Theory of Venture Capital Finance', *Journal of Law, Economics, & Organization,* Vol. 10, No. 2, October 1994, pp. 247-267.

Bertoni, F., Colombo, M.G. & Grilli, L., 'Venture capital financing and the growth of high-tech startups: Disentangling treatment from selection effects', *Research Policy* 40, 2011, pp. 1028-1043.

Bethune, J., 'Never ask for money when you need it', *The Magazine for Canadian entrepreneurs,* Vol. 14, Issue 2, June 1995, pp. 66-68.

Bhagat, S., 'Why do venture capitalists use such high discount rates?', *The Journal of Risk Finance*, Vol. 15, Issue 1, pp. 94-98.

Bill & Melinda Gates Foundation, 'What We Do. Malaria, strategy overview', *Gatesfoundation.org* n.d. (date retrieved: 24 May 2018).

Bloomberg, 'Carried interest', *Bloomberg.com* 23 February 2018, available on < https://www.bloomberg.com/quicktake/carried-interest> (date retrieved: 24 May 2018).

Bloomberg, 'Musk wants to build a rocket that will get you anywhere on earth in an hour', *Bloomberg.com* 29 September 2017 (date retrieved: 24 May 2018).

Board of Governors of the Federal Reserve System, 'Survey of Terms of Business Lending – E.2', Federalreserve.gov 2 August 2017, available on <https://www.federalreserve.gov/releases/e2/current/default.htm> (date retrieved: 24 May 2018).

Brüderl, J. & Preisendörfer, P., 'Network Support and the Success of Newly Founded Businesses', *Small Business Economics* 10, 1998, pp. 213-224.

Bureau of Labor Statistics, 'Entrepreneurship and the U.S. Economy', *Bls.gov* 28 April 2016 (date retrieved: 24 May 2018).

Butler-Bowdon, T., *50 Prosperity Classics*, Boston MA: Nicholas Brealey Publishing 2010.

Casamatta, C., 'Financing and Advising: Optimal Financial Contracts with Venture Capitalists', *The Journal of Finance*, Vol. 58, No. 5, October 2003, pp. 2059-2085.

Cassar, G., 'The financing of business start-ups', *Journal of Business Venturing* 19, 2004, pp. 261-283.

Chemannur, T.J. & Chen, Z., 'Venture Capitalists Versus Angels: The Dynamics of Private Firm Financing Contracts', *The Review of Corporate Finance Studies*, Vol. 3, Issue 1-2, September 2014, pp. 39-86. The references are to the version of March 2006.

Cherif, M. & Elouaer, S., 'Venture Capital Financing: A Theoretical Model', *Journal of Applied Business and Economics*, n.d., pp. 1-26.

Christensen, C.M., *The Innovator's Dilemma*, Boston MA: Harvard Business School Press 1997.

Cole, R.A., 'The importance of relationships to the availability of credit', *Journal of Banking and Finance* 22, 1998, pp. 959-977.

Cole, R.A., Goldberg, L.G. & White, L.J., 'Cookie-Cutter versus Character: The Micro Structure of Small-Business Lending by Large and Small Banks', *Journal of Financial and Quantitative Analysis,* Vol. 39, No. 2, June 2004. The references are to the version of March 2003.

Compass, 'Waterloo Startup Ecosystem Report. The David vs. Goliath of Startup Ecosystems', October 2015, available at <https://www.businesslocationcenter.de/imperia/md/blc/service/download/content/waterloo-startup-ecosystem-report-2015.pdf> (date retrieved: 24 May 2018).

Cornelli, F. & Yosha, O., 'Stage Financing and the Role of Convertible Debt', *London Business School Working Paper*, February 2000, available at <http://facultyresearch.london.edu/docs/253.pdf>.

CrunchBase, 'CrunchBase Data As CSV', 4 December 2015, available on <https://github.com/notpeter/crunchbase-data/blob/master/readme.md> (date retrieved: 24 May 2018).

CrunchBase, 'PastBook', n.d., available on <https://www.crunchbase.com/organization/pastbook> (date retrieved: 24 May 2018).

CrunchBase, 'Voltea', n.d., available on <https://www.crunchbase.com/organization/voltea> (date retrieved: 24 May 2018).

Cumming, D.J., 'Agency Costs, Institutions, Learning and Taxation in Venture Capital Contracting', *Journal of Business Venturing*, Vol. 20, 2005, pp. 573-622.

Davie, A.J., 'Convertible Equity Options for Startups: SAFEs and KISSes', *Strictlybusinesslawblog.com* 12 June 2017 (date retrieved: 24 May 2018).

De Bettignies, J., & Brander, J.A., 'Financing entrepreneurship: Bank finance versus venture capital', *Journal of Business Venturing* 22, 2007, pp. 808-832.

De Rassenfosse, G., & Fischer, T., 'Venture Debt Financing: Determinants of the Lending Decision', *Strategic Entrepreneurship Journal* 10, 2016, pp. 235-256.

Delmar, F., Davidsson, P. & Gartner, W.B., 'Arriving at the high-growth firm', *Journal of Business Venturing* 18, 2003, pp. 189-216.

Deloitte, 'Amazon's Grocery Industry Disruption', *The Wall Street Journal* 17 October 2017 (date retrieved: 24 May 2018).

Dembe, A.E. & Boden, L.I., 'Moral Hazard: A Question of Morality?', *New Solutions,* Vol. 10(3), 2000, pp. 257-279.

Drucker, P.F., *Innovation and Entrepreneurship*, New York NY: Harper & Row 1993.

Duffner, S., Schmid, M.M. & Zimmermann, H., 'Trust and Success in Venture Capital Financing. An Empirical Analysis with German Survey Data', *Kyklos,* Vol. 62, No. 11, February 2009, pp. 15-43. The references are to the version of October 2008.

Ehrlich, S.B., De Noble, A.F., Moore, T. & Weaver, R.R., 'After the Cash arrives: A Comparative Study of Venture Capital and Private Investor Involvement in Entrepreneurial Firms', *Journal of Business Venturing* 9, 1994, pp. 67-82.

Eisenhardt, K.M., 'Agency Theory: An Assessment and Review', *The Academy of Management Review*, Vol. 14, No. 1, January 1989, pp. 57-74.

Ellingsen, T. & Johannesson, M., 'Is There a Hold-up Problem?', *Scandinavian Journal of Economics,* Vol. 106, No. 3, September 2004, pp. 475-494. The references are to the version of March 2003.

Ethiraj, S.K. & Zhu, D.H., 'Performance Effects of Imitative Entry', *Strategic Management Journal*, 29, February 2008, pp. 797-817.

EU Startups, 'Top 15: Europe's biggest startup hubs in 2017', *Eu-startups.com* 3 October 2017, available on <http://www.eu-startups.com/2017/10/top-15-europes-biggest-startup-hubs-in-2017/> (date retrieved: 24 May 2018).

Fairchild, R., 'An entrepreneur's choice of venture capitalist or angel-financing: A behavioral game-theoretic approach', *Journal of Business Venturing* 26, 2011, pp. 359-374.

Feinleib, D., *Why Startups Fail*, New York City: Apress 2012.

Financial Review, 'Why Winner-Takes-All Thinking Does not Apply to the Platform Economy', *Afr.com* 24 October 2016 (date retrieved: 24 May 2018).

Freear, J., Sohl, J.E. & Wetzel, W., 'Angles on angels: Financing technology-based ventures – a historical perspective', *Venture Capital: An International Journal of Entrepreneurial Finance*, 2002, 4, pp. 275-287.

Geibel, R.C., & Manickam, M., 'Comparison of selected startup ecosystems in Germany and in the USA', *GSTF Journal on Business Review,* Vol. 4, No. 3, June 2016, pp. 66-71.

Ghosh, S., in: The Wall Street Journal, 'The Venture Capital Secret: 3 Out of 4 Start-Ups Fail', *Wsj.com* 20 September 2012 (date retrieved: 24 May 2018).

Gilson, R.J. & Black, B.S., 'Venture Capital and the Structure of Capital Markets: Banks versus Stock Markets', *Journal of Financial Economics,* Vol. 47, 1998, pp. 243-277.

Global Entrepreneurship Research Association, 'Global Report 2017/18 – Global Entrepreneurship Monitor', available at <https://www.gemconsortium.org/report/50012> (date retrieved: 24 May 2018).

Global Entrepreneurship Research Association, 'Global Report 2017/18', n.d., available on < https://www.gemconsortium.org/report> pp. 1-154.

Hall, R.E. & Woodward, S.E., 'The incentives to start new companies: Evidence from venture capital', *NBER Working Paper* April 2007, pp. 1-39.

Haynes, K.T., Hitt, M.A. & Campbell, J.T., 'The Dark Side of Leadership: Towards a Mid-Range Theory of Hubris and Greed in Entrepreneurial Contexts', *Journal of Management Studies* 52:4, June 2015, pp. 479-505.

Hellmann, T., 'IPOs, acquisitions, and the use of convertible securities in venture capital', *Journal of Financial Economics* 81, 2006, pp. 649-679.

Hellmann, T.F., Schure, P.H. & Vo, D.H., 'Angels and Venture Capitalists: Substitutes or Complements?', *Saïd Business School Working Paper* August 2017.

Henrekson, M. & Johansson, D., 'Gazelles as job creators: a survey and interpretation of the evidence', *Small Business Economics* 2010, 35, pp. 227-244.

Henrekson, M., 'Entrepreneurship and Institutions', *IFN Working Paper No. 707*, 2007.

Hirsch, J. & Walz, U., 'Why do contracts differ between venture capital types?', *Small Business Economics* 2003, 40, pp. 511-525.

Houben, E., 'Venture Capital, Double-sided Adverse Selection, and Double-sided Moral Hazard', *Working Paper University of Kiel* 2002, pp. 1-31.

Hsu, D.H., 'What Do Entrepreneurs Pay for Venture Capital Affiliation?', *The Journal of Finance,* Vol. LIX No. 4, August 2004, pp. 1805-1844.

Huyghebaert, N. & Van de Gucht, L.M., 'The Determinants of Financial Structure: New Insights from Business Start-ups', *European Financial Management*, Vol. 13, No. 1, 2007, pp. 101-133.

Huyghebaert, N., 'The Capital Structure of Business Start-Ups: Policy Implications', *Tijdschrift voor Economie en Management,* Vol. XLVIII, 1, 2003, pp. 23-46.

IESE Business School University of Navarra, 'The Venture Capital and Private Equity Country Attractiveness Index 2018', *Iese.edu*, available on <https://blog.iese.edu/vcpeindex/files/2018/02/report2018.pdf>, pp. 1-44 (date retrieved: 24 May 2018).

ING, 'Airbnb heeft flink opwaarts effect op Amsterdamse huizenprijzen' ("Airbnb has a significant upward effect on house prices in Amsterdam", *Ing.nl* 25 April 2016, available on <

https://www.ing.nl/nieuws/nieuws_en_persberichten/2016/04/airbnb_heeft_flink_opwaarts_effect_op_amsterdamse_huizenprijzen.html> (date retrieved: 24 May 2018).

International Monetary Fund, 'Gross domestic product in U.S. dollars', *Imf.org* April 2018, available on <https://bit.ly/2J73s79> (date retrieved: 24 May 2018).

International Monetary Fund, 'Gross domestic product per capita in Purchasing power parity international dollars units', *Imf.org* October 2017, available on <https://bit.ly/2DLfIHh> (date retrieved: 24 May 2018).

Kaplan, S.N. & Strömberg, P., 'Financial Contracting Theory Meets the Real World: An Empirical Analysis of Venture Capital Contracts', *Review of Economic Studies* 2002, 00, pp. 1-35.

Kauffman Foundation, 'Measuring an Entrepreneurial Ecosystem', March 2015, pp. 1-12.

Kauffman Foundation, 'Path-Depending Startup Hubs. Comparing Metropolitan Performance: High-Tech and ICT Startup Density', September 2013, pp. 1-18.

Kerr, W.R., Lerner, J. & Schoar, A., 'The Consequences of Entrepreneurial Finance: A Regression Discontinuity Analysis', *Working Paper National Bureau of Economic Research* March 2010.

Korunka, C., Kessler, A., Frank, H. & Lueger, M., 'Personal characteristics, resources, and environment as predictors of business survival', *Journal of Occupational and Organizational Psychology* 2010, 83, pp. 1025-1051.

Koss, A., 'Best Practice Guidance for Angel Groups – Deal Structure and Negotiation', *Working Paper New York University* July 2007.

Kraus, A. & Litzenberger, R.H., 'A State-Preference Model of Optimal Financial Leverage', *The Journal of Finance*, Vol. 28, No. 4, September 1973, pp. 911-922.

Laerd Statistics, 'One-way ANOVA', n.d., available on <https://statistics.laerd.com/statistical-guides/one-way-anova-statistical-guide-2.php> (date retrieved: 24 May 2018).

Laerd Statistics, 'One-way ANOVA', n.d., available on <https://statistics.laerd.com/statistical-guides/one-way-anova-statistical-guide-3.php> (date retrieved: 24 May 2018).

Leshchinskii, D., 'Indulgent Angels or Stingy Venture Capitalists? The Entrepreneurs' Choice', *Working Paper HEC* November 2002.

Lieberman, M.B. & Montgomery, D.B., 'First-Mover Advantages', *Strategic Management Journal,* Vol. 9, Special Issue Strategy Content Research, Summer 1988, pp. 41-58.

Luukkonen, T., Deschryvere, M. & Bertoni, F., 'The value added by government venture capital funds compared with independent venture capital funds', *Technovation* 33, 2013, pp. 154-162.

Manigart, S. & Beuselinck, C., 'Supply of Venture Capital by European Governments', *Working Paper Universiteit Gent* August 2001.

Mason, C.M. & Harrison, R.T., 'Is it worth it? The rates of return from informal venture capital investments', *Journal of Business Venturing* 17, 2002, pp. 211-236.

Mills, K.G. & McCarthy, B., 'The State of Small Business Lending: Credit Access during the Recovery and How Technology May Change the Game', *Working Paper Harvard Business School* July 2014.

Minola, T. & Giorgino, M., 'Who's going to provide the funding for high tech start-ups? A model for the analysis of determinants with a fuzzy approach', *R&D Management* 38, 3, 2008, pp. 335-351.

Mordkoff, J.T., 'The Assumption(s) of Normality', 2016, available on <http://www2.psychology.uiowa.edu/faculty/mordkoff/GradStats/part%201/I.07%20normal.pdf> (date retrieved: 24 May 2018), pp. 1-6.

Mueller, E., 'Benefits of Control, Capital Structure and Company Growth', *Working Paper London School of Economics*, September 2002.

Murray, G., 'Early-stage venture capital funds, scale economies and public support', *Venture Capital: An International Journal of Entrepreneurial Finance* 1999, 1:4, pp. 351-384.

Myers, S.C. & Majluf, N.S., 'Corporate Financing and Investment Decisions when firms have information that investors do not have', *Journal of Financial Economics* 13, 1984, pp. 187-221.

NACO, '2016 Report on Angel Investing Activity in Canada', May 2017, available on <https://www.nacocanada.com/cpages/angel-activity-report> pp. 1-68.

Nations Online, 'Country Codes List', *Nationsonline.org* n.d. (date retrieved: 24 May 2018).

Nofsinger, J.R. & Wang, W., 'Determinants of start-up firm external financing worldwide', *Journal of Banking & Finance* 35, 2011, pp. 2282-2294.

OECD, 'Government Venture Capital for Technology-based Firms', *Working Paper OECD*, pp. 1-34.

Paik, J. & Woo, H., 'Economic Downturn and Financing Innovative Startup Companies', *Managerial and Decision Economics* 35, 2014, pp. 114-128.

Park, B. & Vermeulen, E.P.M., 'The Future of Venture Capital in Europe: Applicable Lessons from the United States' in: D.A. Zetsche (Ed.), *The Alternative Investment Fund Managers Directive*, Den Haag: Kluwer Law International 2015.

Pauly, M.V., 'The Economics of Moral Hazard: Comment', *The American Economic Review,* Vol. 58, No. 3, June 1968, pp. 531-537.

Prowse, S., 'Angel investors and the market for angel investments', *Journal of Banking & Finance*, Vol. 22(6-8), August 1998, pp. 785-792.

Puri, M. & Zarutskie, R., 'On the Lifecycle Dynamics of Venture-Capital and Non-Venture-Capital-Financed Firms', *Working Paper National Bureau of Economic Research* August 2008.

Schmidt, K.M., 'Convertible Securities and Venture Capital Finance', *Working Paper University of Munich,* June 2001.

Schumpeter, J.A., *Capitalism, Socialism & Democracy* (originally published in 1942) Third edition, Abingdon UK: Taylor & Francis 1976.

Schwienbacher, A., 'An Empirical Analysis of Venture Capital Exits in Europe and the United States', *Working Paper University of Amsterdam,* January 2005.

Shane, S., 'The Importance of Angel Investing in Financing the Growth of Entrepreneurial Ventures', *Working Paper U.S. Small Business Administration* September 2008.

Shane, S., 'Why encouraging more people to become entrepreneurs is bad public policy', *Small Business Economics* 2009, 33, pp. 141-149.

Siddiqui, A., Marinova, D., & Hossain, A., 'Impact of Venture Capital Investment Syndication on Enterprise Lifecycle and Success', *International Journal of Economics and Finance*, Vol. 8, No. 5, 2016, pp. 75-85.

Startup Genome, 'Global Startup Ecosystem Report 2017', December 2017, pp. 1-152.

STATA, 'Analysis of Variance', available on < https://people.umass.edu/biep640w/pdf/STATA%20v14%20for%20Analysis%20of%20Variance.pdf> (date retrieved: 24 May 2018), pp. 1-21.

Statista, 'Worldwide mobile internet advertising revenue of Instagram from 2015 to 2018', *Statista*, n.d., available on <https://www.statista.com/statistics/448157/instagram-worldwide-mobile-internet-advertising-revenue/> (date retrieved: 24 May 2018).

Taulli, T., *How to Create the Next Facebook,* New York City: Apress 2012.

Thompson, P., 'Angel Investors: Structuring Deals that Work', *Thompsonlaw.ca*, n.d.

Ueda, M., 'Banks versus Venture Capital: Project Evaluation, Screening, and Expropriation', *The Journal of Finance*, Vol. 59, No. 2, April 2004, pp. 601-621.

University of New Hampshire, 'UNH Center for Venture Research: Angel Investor Market in 2015 a Buyer's Market', *Unh.edu* 25 May 2016, available on <https://www.unh.edu/unhtoday/news/release/2016/05/25/unh-center-venture-research-angel-investor-market-2015-buyers-market> (date retrieved: 24 May 2018).

Vinig, T. & De Haan, M., 'How Do Venture Capitalists Screen Business Plans. Evidence from The Netherlands and The US', *Working Paper University of Amsterdam* 2002, pp. 1-23.

Weinzimmer, L.G., Nystrom, P.C. & Freeman, S.J., 'Measuring Organizational Growth: Issues, Consequences and Guidelines', *Journal of Management*, 1998, Vol. 24, No. 2, pp. 235-262.

Wetzel, W.E., 'Angels and Informal Risk Capital', *Sloan Management Review*, Summer 1983, 24, 4, pp. 23-34.

Williamson, O.E., 'Transaction-Cost Economics: The Governance of Contractual Relations', *The Journal of Law & Economics*, Vol. 22, No. 2, October 1979, pp. 233-261.

Wiltbank, R. & Boeker, W., 'Returns to Angel Investors in Groups', *Working Paper* November 2007, pp. 1-16.

Wong, A., 'Angel Finance: The Other Venture Capital', *Working Paper University of Chicago,* January 2002, pp. 1-64.

Wong, P.K., Ho, Y.P. & Autio, E., 'Entrepreneurship, Innovation and Economic Growth: Evidence from GEM Data', *Small Business Economics*, 2005, 24, pp. 335-350.

Wright, M. & Lockett, A., 'The Structure and Management of Alliances: Syndication in the Venture Capital Industry', *Journal of Management Studies* 40:8, December 2003, pp. 2073-2102.

Zervas, G., Proserpio, D. & Byers, J.W., 'The Rise of the Sharing Economy: Estimating the Impact of Airbnb on the Hotel Industry', *Working Paper Boston University*, November 2016, pp. 1-45.

ANNEX I: VARIABLES IN DATASET CRUNCHBASE

Used variables in the dataset "Companies CrunchBase"	
age	The age of the company on 4 December 2015. This was calculated on the basis of the founding date of the company, i.e. =(42342-[@[founded_at]])/365,25
total_funding (funding_total_usd in original dataset)	The total funding obtained by the company.
funding_rounds	The total number of funding rounds of the company.
status	The status of the company: operating, closed, acquired, or IPO.
statuss	Dummy variables for the status of the company 1 = operating, 2 = ipo, 3 = acquired, 4 = closed
startup	Dummy variables for the startup-status of the company 1 = companies younger than five years old or five years old (startup), 0 = companies older than five years
country_code	The three letter ISO-code of the country.

Used variables in the dataset "Rounds CrunchBase"	
total_funding	The total funding obtained by the company.
type_funding	The types of possible funding: angel investment, convertible note, debt financing, equity crowdfunding, grant, non-equity assistance, post IPO debt, private equity, product crowdfunding, seed, undisclosed, venture capital.
type_fundingss	Dummy variables for the types of funding: 1 = angel, 2 = convertible note, 3 = debt financing, 4 = equity crowdfunding, 5 = grant, 6 = private equity, 7 = product crowdfunding, 8 = seed, 9 = undisclosed, 10 = venture
round_amount	
country_code	The three letter ISO-code of the country.

ANNEX II: STATA COMMANDS

This annex summarizes the used to-do files in the statistics programme of Stata, so the commands that were used to get the results as described in Chapter 3 and 4.

Companies dataset	
drop if total_funding==0	Drop the companies with a total funding of $0.
drop if total_funding ==.	Drop the companies with a missing total funding amount.
drop if age >115	Drop the companies older than 115 years old.
encode (status), generate (status2)	Convert a string variable to a numeric variable, in order to use the ANOVA-test.
anova total_funding status2	Determine whether the assumption for homogeneity of variances holds (Bartlett's test), i.e. 5th assumption
predict ehat, residuals	Determine whether the null hypothesis of normality holds (Shapiro-Wilk test), i.e. 4th assumption
swilk ehat	- see above -
histogram ehat, normal	Give a graphical overview of the data, to see whether the data is normally distributed in a bell-shape.
robvar total_funding, by (status)	Determine whether the null hypothesis of homogeneity of variances holds (Levene test), i.e. 5th assumption, better test when assumption of normality probably does not hold.
sum	Describe the variables for this country's companies, like the average age and average total funding.
bysort funding_rounds: sum total_funding	The average amounts of total funding depending on the number of financing rounds.
oneway total_funding funding_rounds, tabulate	Perform an ANOVA-test to determine whether there are significant differences between the total funding averages of the number of funding rounds
pwmean total_funding, over(funding_rounds) mcompare(tukey) effects	(if the previous ANOVA-test showed a significant difference) Test which financing rounds are significantly different from each other.
gen statuss = .	Generate a new variable, to be able to create dummy-variables in order to perform the ANOVA-test.
replace statuss=1 if status=="operating"	- see above -
replace statuss=2 if status=="ipo"	- see above -
replace statuss=3 if status=="acquired"	- see above -
replace statuss=4 if status=="closed"	- see above -
oneway total_funding statuss, tabulate	Perform an ANOVA-test to determine whether there are significant differences between the total funding averages of the statutes.
pwmean total_funding, over(statuss) mcompare(tukey) effects	(if the previous ANOVA-test showed a significant difference) Test which statutes are significantly different from each other.
generate startup = 0	Generate a new variable.
replace startup = 1 if age<5	- see above -
replace startup = . if missing(age)	- see above -
oneway total_funding startup, tabulate	Perform an ANOVA-test to determine whether there is a significant difference between the total funding averages of a startup and not-startup.
pwmean total_funding, over(startup) mcompare(tukey) effects	(if the previous ANOVA-test showed a significant difference) Test the difference between the amounts. *Note that in this case with two groups a t-test would have been sufficient.*

Companies startups dataset	
drop if age>5	Drop the companies older than five years old, in order to only use the startup companies.
encode (status), generate (status2)	Convert a string variable to a numeric variable, in order to use the ANOVA-test.
anova total_funding status2	Determine whether the assumption for homogeneity of variances holds (Bartlett's test), i.e. 5th assumption
predict ehat, residuals	Determine whether the null hypothesis of normality holds (Shapiro-Wilk test), i.e. 4th assumption
swilk ehat	- see above -
histogram ehat, normal	Give a graphical overview of the data, to see whether the data is normally distributed in a bell-shape.
robvar total_funding, by (status)	Determine whether the null hypothesis of normality holds (Levene test), i.e. 4th assumption, better test when assumption of normality probably does not hold.
gen statuss = .	Generate a new variable, to be able to create dummy-variables in order to perform the ANOVA-test.
replace statuss=1 if status=="operating"	- see above -
replace statuss=2 if status=="ipo"	- see above -
replace statuss=3 if status=="acquired"	- see above -
replace statuss=4 if status=="closed"	- see above -
oneway total_funding statuss, tabulate	Perform an ANOVA-test to determine whether there are significant differences between the total funding averages of the statutes.
pwmean total_funding, over(statuss) mcompare(tukey) effects	(if the previous ANOVA-test showed a significant difference) Test which statutes are significantly different from each other.
sum	Describe the variables for this country's companies, like the average age and average total funding.
bysort funding_rounds: sum total_funding	The average amounts of total funding depending on the number of financing rounds.
oneway total_funding funding_rounds, tabulate	Perform an ANOVA-test to determine whether there are significant differences between the total funding averages of the number of funding rounds
pwmean total_funding, over(funding_rounds) mcompare(tukey) effects	(if the previous ANOVA-test showed a significant difference) Test which financing rounds are significantly different from each other.

Rounds dataset	
drop if round_amount==0	Drop the round amounts with a round amount of $0.
drop if round_amount ==.	Drop the round amounts with a missing round amount.
drop if round_amount>200000000	Drop the round amounts higher than $200 million (or $500 million, depending on the normality plot).
encode (type_funding), generate (type_funding2)	Convert a string variable to a numeric variable, in order to use the ANOVA-test.
anova round_amount type_funding2	Determine whether the assumption for homogeneity of variances holds (Bartlett's test), i.e. 5th assumption
predict ehat, residuals	Determine whether the null hypothesis of normality holds (Shapiro-Wilk test), i.e. 4th assumption
swilk ehat	- see above -
histogram ehat, normal	Give a graphical overview of the data, to see whether the data is normally distributed in a bell-shape.

robvar round_amount, by(type_funding)	Determine whether the null hypothesis of normality holds (Levene test), i.e. 4th assumption, better test when assumption of normality probably does not hold.
tabulate type_funding, summarize (round_amount)	Give the frequency and round amount of each type of funding.
gen type_fundingss = .	Generate a new variable, to be able to create dummy-variables in order to perform the ANOVA-test.
replace type_fundingss=1 if type_funding=="angel"	- see above -
replace type_fundingss=2 if type_funding=="convertible_note"	- see above -
replace type_fundingss=3 if type_funding=="debt_financing"	- see above -
replace type_fundingss=4 if type_funding=="equity_crowdfunding"	- see above -
replace type_fundingss=5 if type_funding=="grant"	- see above -
replace type_fundingss=6 if type_funding=="private_equity"	- see above -
replace type_fundingss=7 if type_funding=="product_crowdfunding"	- see above -
replace type_fundingss=8 if type_funding=="seed"	- see above -
replace type_fundingss=9 if type_funding=="undisclosed"	- see above -
replace type_fundingss=10 if type_funding=="venture"	- see above -
replace type_fundingss=11 if type_funding=="post_ipo_equity"	- see above -
replace type_fundingss=12 if type_funding=="post_ipo_debt"	- see above -
replace type_fundingss=13 if type_funding=="secondary_market"	- see above -
replace type_fundingss=14 if type_funding=="non_equity_assistance"	
oneway round_amount type_fundingss, tabulate	Perform an ANOVA-test to determine whether there are significant differences between the averages of the round amounts depending on the type of funding.
pwmean round_amount, over(type_fundingss) mcompare(tukey) effects	(if the previous ANOVA-test showed a significant difference) Test which types of funding are significantly different.

Rounds all countries dataset	
drop if round_amount ==0	Drop all round amounts with a round amount of $0.
drop if round_amount ==.	Drop all round amounts with a missing round amount.
drop in 1/5815	Drop all unknown countries (after sorting the countries and determining which round amounts did not have a country).
sum	Describe the variables for all round amounts.
drop if age>5	Drop all companies with a financing rounds earlier than five years ago (i.e. before 4 December 2010).
tabulate type_funding, summarize (round_amount)	Get the average round amounts per type of funding.
tabulate country, summarize (round_amount)	Get the average round amounts per country.
drop if round_amount <1000000	Drop all round amounts lower than $10 million.

ANNEX III: ASSUMPTIONS STATISTICAL TESTS

The assumptions will be accepted when the p-value is higher than 0.01. And note that the startup datasets are more important than the general datasets, because this thesis' goal is to advise startups, and not companies in general. The total funding was tested for the status, and the round amount for the type of funding.

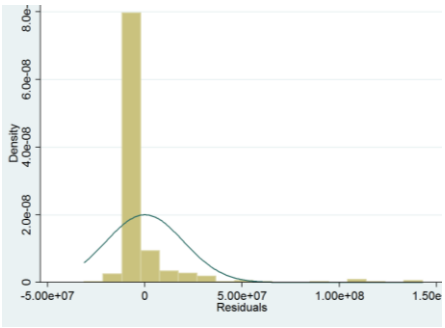
The Netherlands

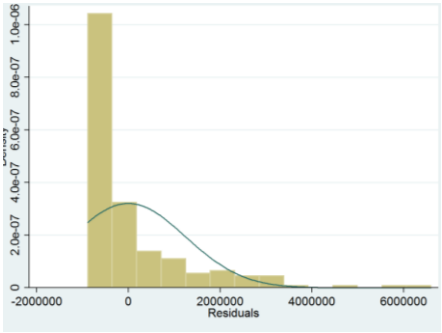
Companies dataset:

- Null hypothesis of normality: Shapiro-Wilk p = 0.00000, assumption of normality rejected.
- Homogeneity of variance: Levene, p = 0.032, assumption of equal variances accepted.

Companies startup dataset:

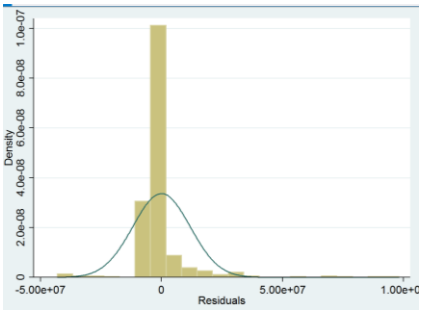
- Null hypothesis of normality: Shapiro-Wilk, p = 0.0000, assumption of normality rejected.
- Homogeneity of variance: Levene, p = 0.140, assumption of equal variances accepted.





Rounds dataset:

- Null hypothesis of normality: Shapiro-Wilk, p = 0.00000, assumption of normality rejected.
- Homogeneity of variance: Levene, p = 0.00000, assumption of homogeneity of variances rejected.



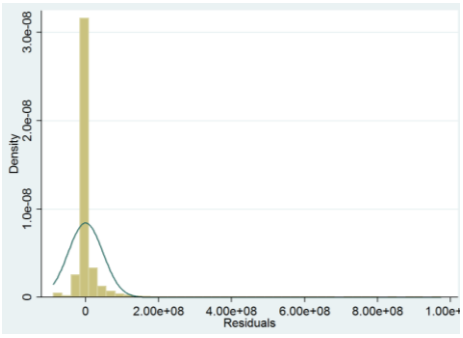
The United States of America

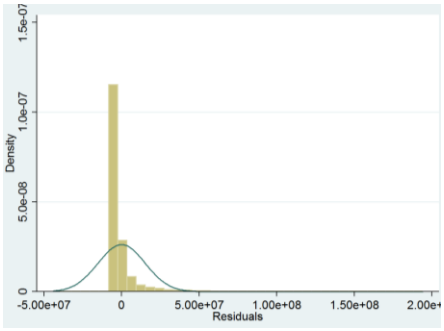
Companies dataset:

- Null hypothesis of normality: Shapiro-Wilk, p = 0.00000, assumption of normality rejected.
- Homogeneity of variance: Levene, p = 0.00000, assumption of homogeneity of variances rejected.

Companies startup dataset:

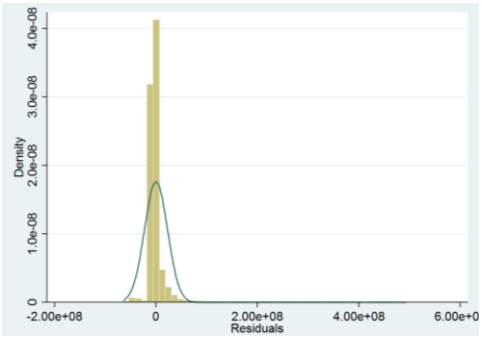
- Null hypothesis of normality: Shapiro-Wilk, p = 0.00000, assumption of normality rejected.
- Homogeneity of variance: Bartlett, p = 0.00000, assumption of homogeneity of variances rejected.
- Homogeneity of variance: Levene





Rounds dataset:

- Null hypothesis of normality: Shapiro-Wilk, p = 0.00000, assumption of normality rejected.
- Homogeneity of variance: Levene, p = 0.00000, assumption of homogeneity of variances rejected.



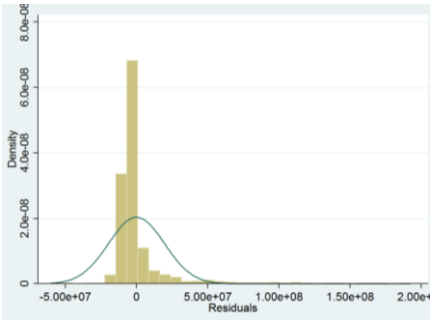
The United Kingdom

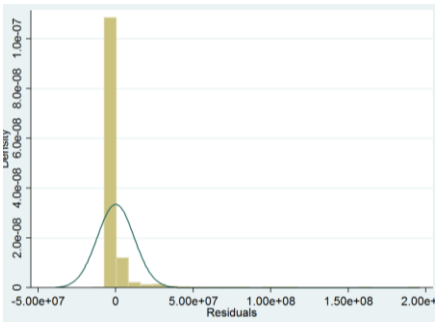
Companies dataset:

- Null hypothesis of normality: Shapiro-Wilk, p = 0.00000, assumption of normality rejected.
- Homogeneity of variance: Levene, p = 0.00000, assumption of homogeneity of variances rejected.

Companies startup dataset:

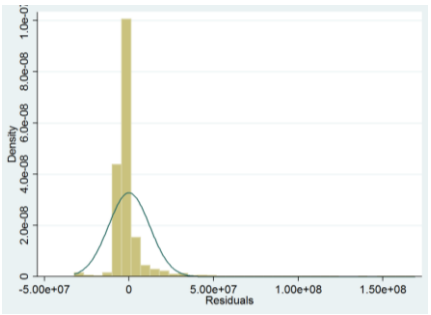
- Null hypothesis of normality: Shapiro-Wilk, p = 0.00000, assumption of normality rejected.
- Homogeneity of variance: Levene , p = 0.0044, assumption of homogeneity of variances rejected.





Rounds dataset:

- Null hypothesis of normality: Shapiro-Wilk, p = 0.00000, assumption of normality rejected.
- Homogeneity of variance: Levene, p = 0.00000, assumption of homogeneity of variances rejected.



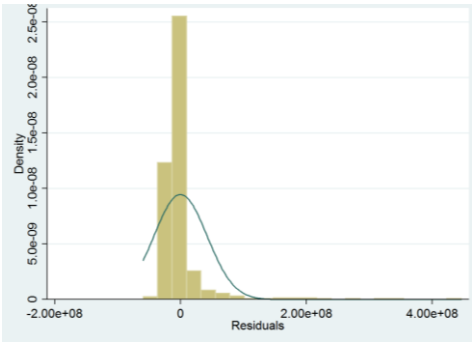
Germany

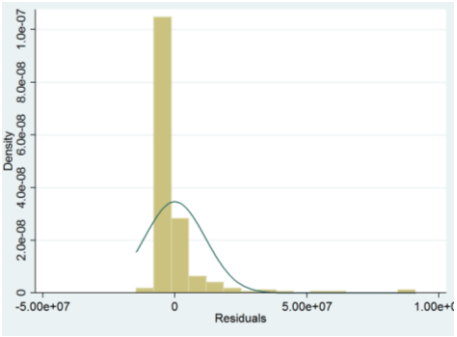
Companies dataset:

- Null hypothesis of normality: Shapiro-Wilk, p = 0.00000, assumption of normality rejected.
- Homogeneity of variance: Levene, p = 0.0828, assumption of homogeneity of variances accepted.

Companies startup dataset:

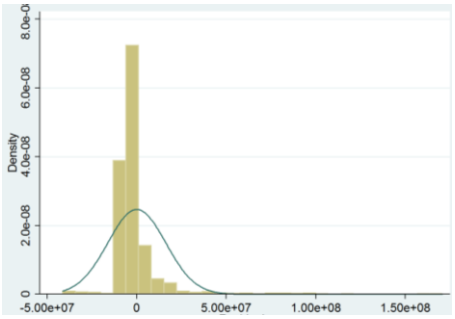
- Null hypothesis of normality: Shapiro-Wilk, p = 0.00000, assumption of normality rejected.
- Homogeneity of variance: Levene, p = 0.0205, assumption of homogeneity of variances accepted.





Rounds dataset:

- Null hypothesis of normality: Shapiro-Wilk, p = 0.00000, assumption of normality rejected.
- Homogeneity of variance: Levene, p = 0.00000, assumption of homogeneity of variances rejected.



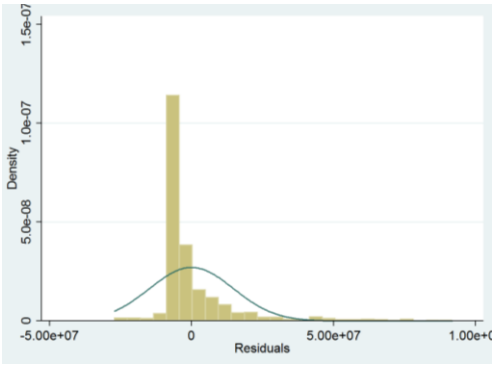
Israel

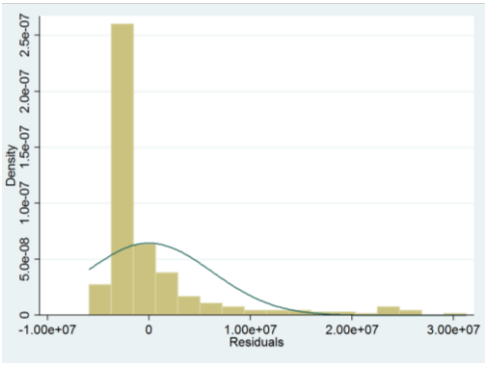
Companies dataset:

- Null hypothesis of normality: Shapiro-Wilk, p = 0.00000, assumption of normality rejected.
- Homogeneity of variance: Levene, p = 0.00000, assumption of homogeneity of variances rejected.

Companies startup dataset:

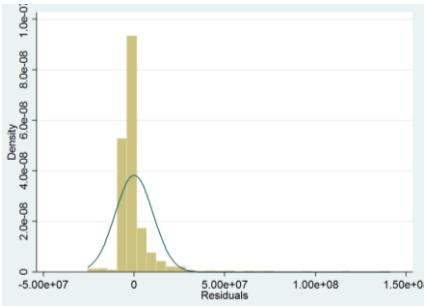
- Null hypothesis of normality: Shapiro-Wilk, p = 0.00000, assumption of normality rejected.
- Homogeneity of variance: Levene, p = 0.1034, assumption of homogeneity of variances accepted.





Rounds dataset:

- Null hypothesis of normality: Shapiro-Wilk, p = 0.00000, assumption of normality rejected.
- Homogeneity of variance: Levene, p = 0.00000, assumption of homogeneity of variances rejected.



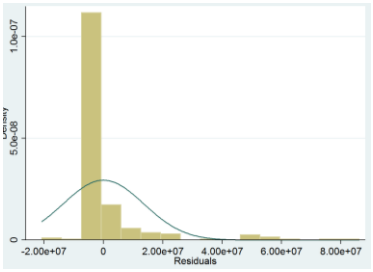
Sweden

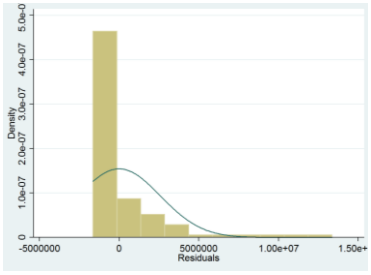
Companies dataset:

- Null hypothesis of normality: Shapiro-Wilk, p = 0.00000, assumption of normality rejected.
- Homogeneity of variance: Levene, p = 0.0251, assumption of homogeneity in variances accepted.

Companies startup dataset:

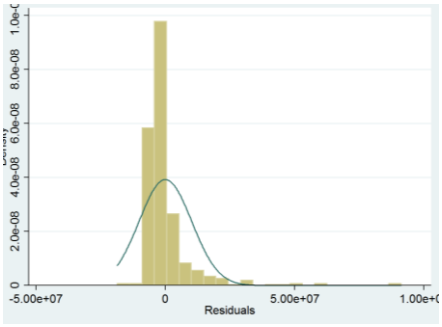
- Null hypothesis of normality: Shapiro-Wilk, p = 0.00000, assumption of normality rejected.
- Homogeneity of variance: Levene, p = 0.3427, assumption of homogeneity in variances accepted.





Rounds dataset:

- Null hypothesis of normality: Shapiro-Wilk, p = 0.00000, assumption of normality rejected.
- Homogeneity of variance: Levene, p = 0.00000, assumption of homogeneity of variances rejected.



ANNEX IV: SELECTION OF COUNTRIES

Apart from the literature and empirical studies mentioned in Chapter 2, the additional sources are used to determine which countries to select for the empirical comparative analysis (*see* **Figure 25, Figure 26, Figure 27**). On the basis of these graphs, Luxembourg, Lithuania and Latvia seem to be good countries (high ratio), as well as Germany and the United Kingdom (high total number).

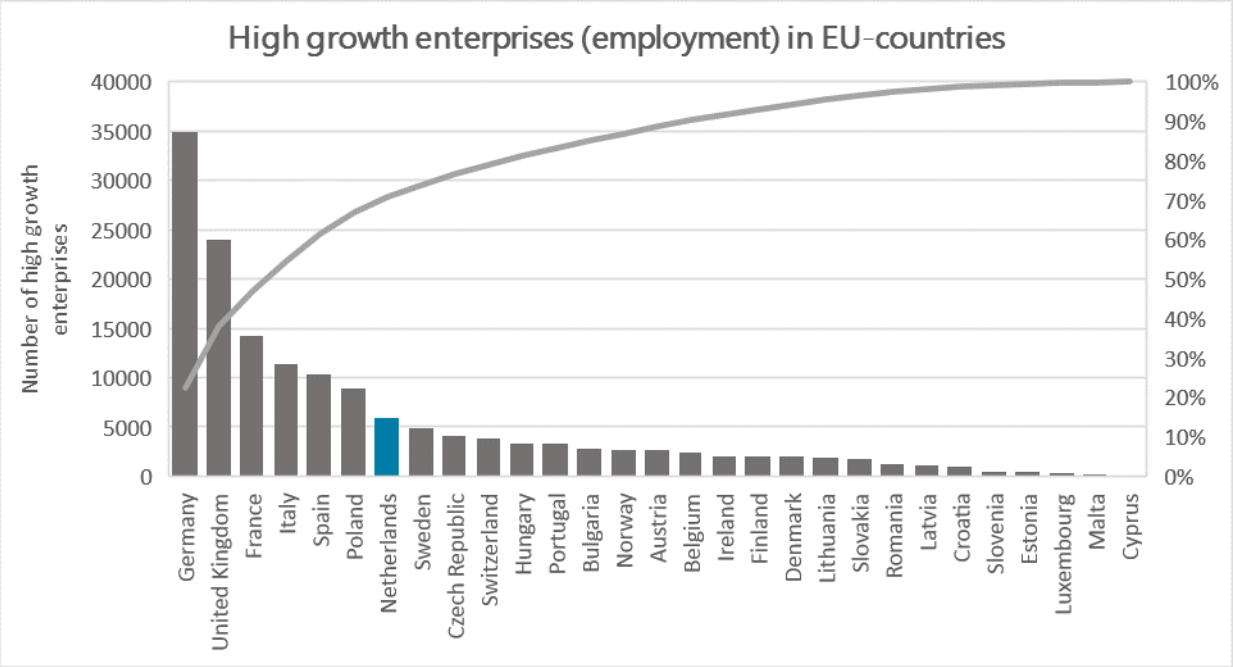


Figure 25: High growth enterprises (growth by 10% or more) and related employment in various EU-countries, with the average of the years 2012-2015. Source: Eurostat 2018.

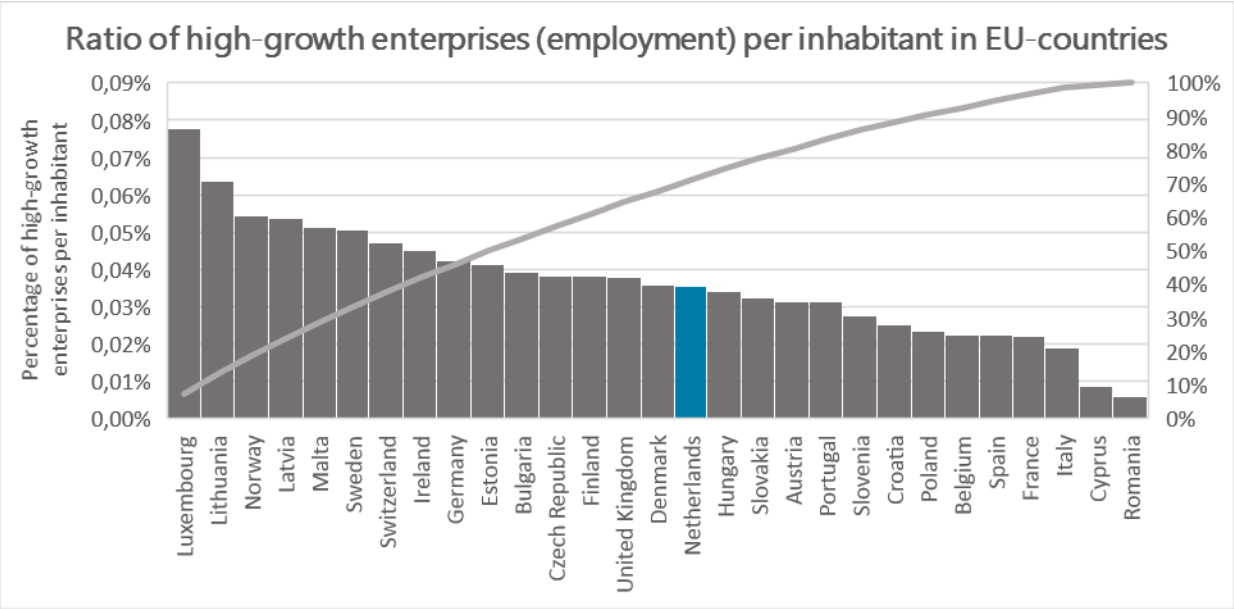


Figure 26: The ratio of high growth enterprises (growth by 10% or more) and related employment in various EU-countries, with the average of the years 2012-2015, per inhabitant. Source: Eurostat 2018 and Statistics Times 2015.

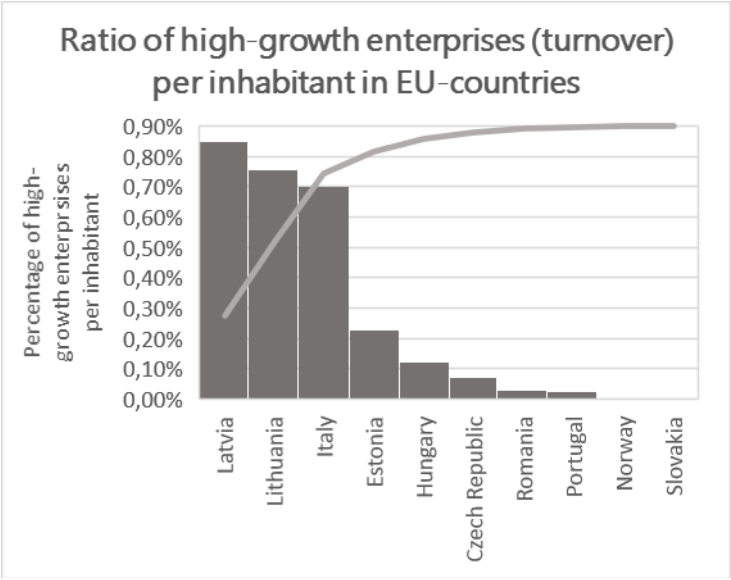


Figure 27: The ratio of high growth enterprises (growth by 10% or more) and related turnover in various EU-countries, with the average of the years 2012-2015, per inhabitant. Note that data is missing from the other EU-countries, so this figure gives an incomplete overview. Source: Eurostat 2018 and Statistics Times 2015.

ANNEX V: DEMOGRAPHIC COMPARISON SELECTED COUNTRIES

In this annex a short comparison is given for the GDP per capita, the population, and the size countries (with year 2015, because the dataset is of 2015) (*see* **Table 18**). The United States' GDP per capita is slightly higher than the other countries. The GDP of the Netherlands is comparable with the United States, United Kingdom, Germany, Israel and Sweden. The population of the Netherlands is comparable with the population of Israel and Sweden. The geographical size of the Netherlands is comparable with the geographical size of Israel.

Table 18: Demographic comparison of the countries

Countries	GDP per capita 2015	Population 2015	Size country
Netherlands	$44,293	16.9 million	41,543 km^2
United States of America	$56,207	321 million	9,834,000 km^2
United Kingdom	$43,930	65 million	242,495 km^2
Germany	$41,177	82 million	357,376 km^2
Israel	$35,729	8.4 million	20,770 km^2
Sweden	$50,585	9.8 million	447,435 km^2

ANNEX VI: WORLDWIDE COMPANIES

A short overview of the countries with 50 or more financing rounds, and their average round amounts (*see* **Figure 28**), as well as the frequency (*see* **Figure 29**). Note that the United States (68% of total world financing rounds) is excluded in the second graph, in order not to distort the graph.

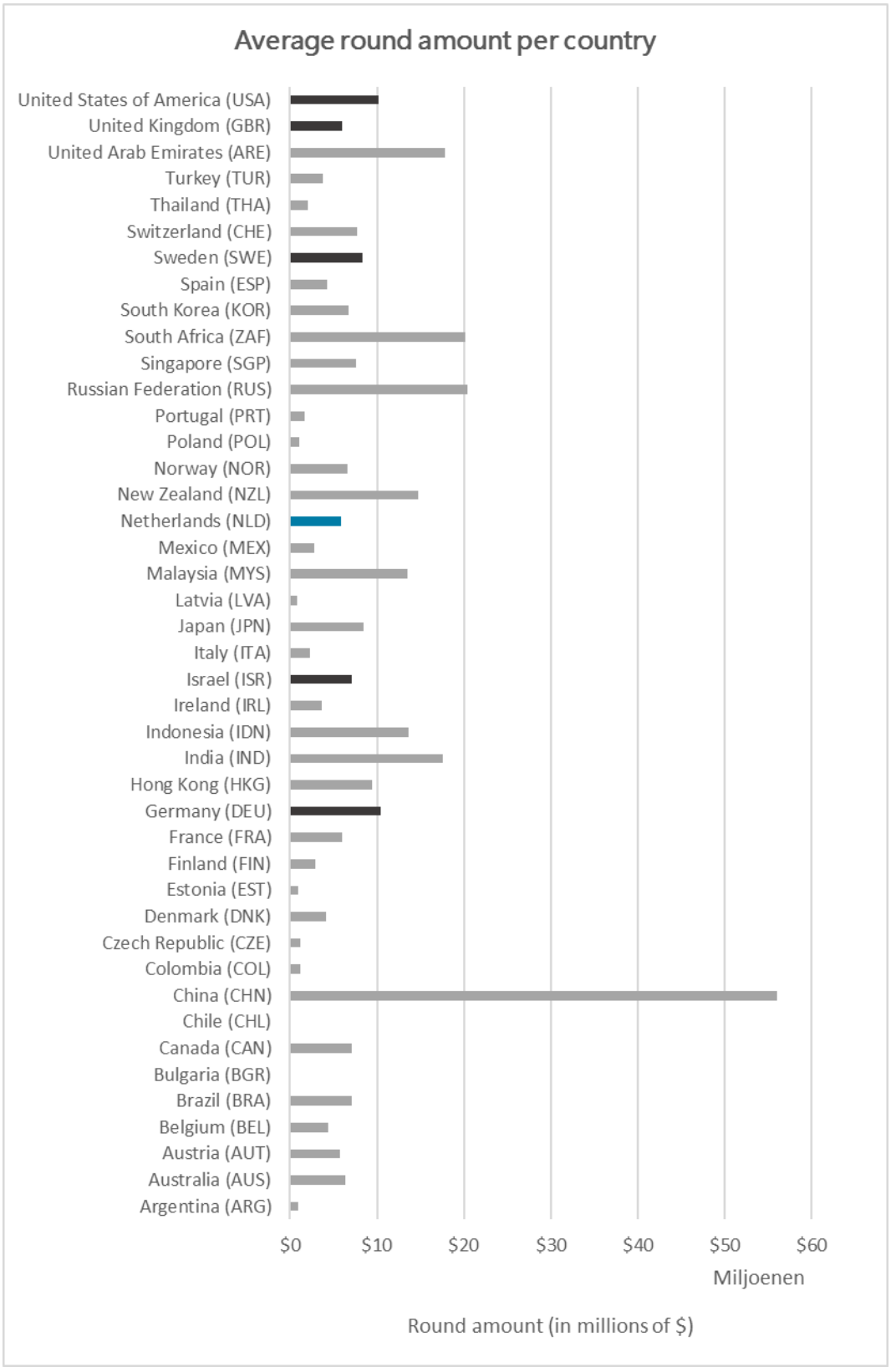


Figure 28: Average round amount of companies in countries with 50 or more financing rounds.

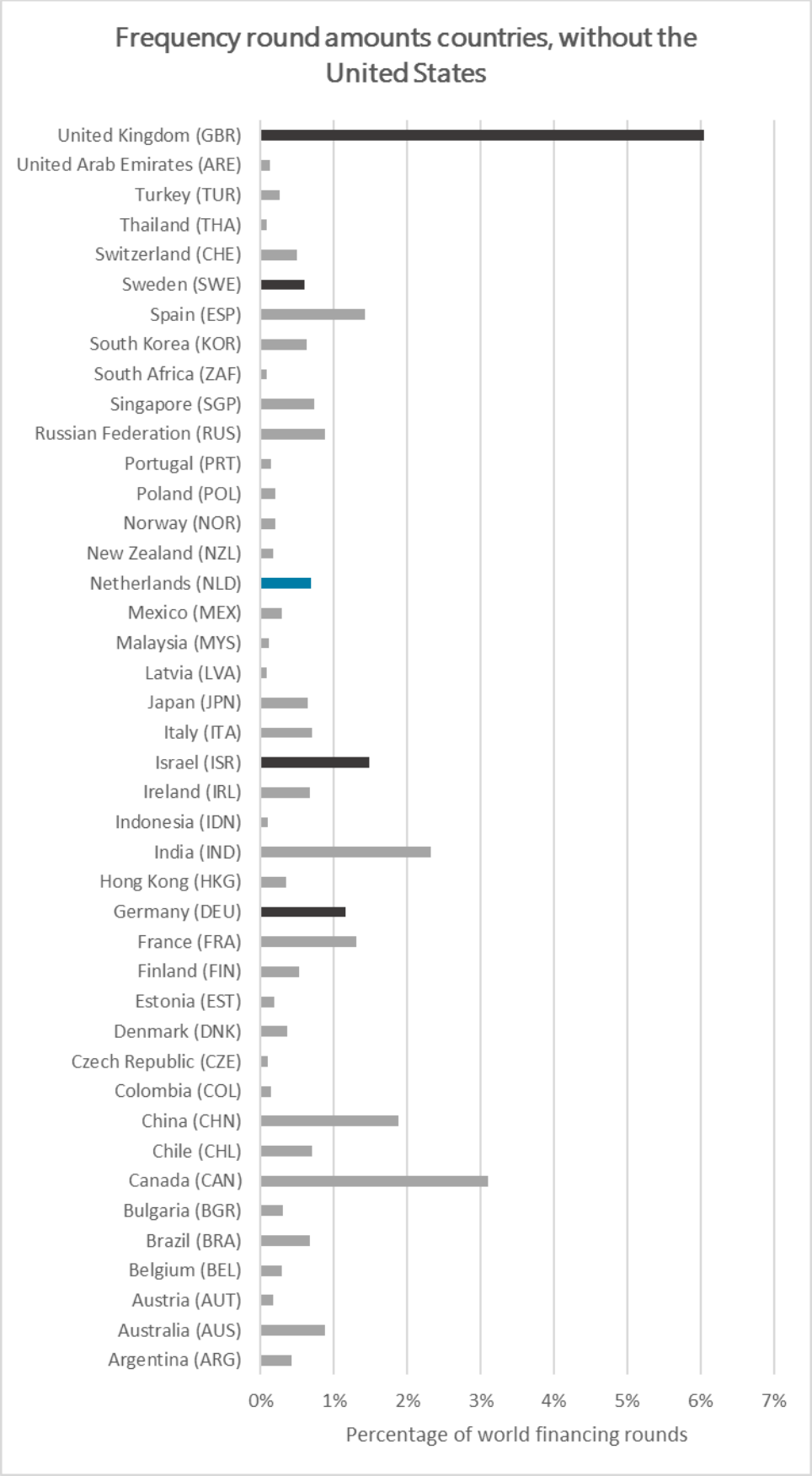


Figure 29: Percentage of financing rounds of companies, only including countries with at least 50 financing rounds. Note that the United States is not included, because the high frequency (>60%) would distort the graph.