Tampere University

Kalle Räty

RISK MANAGEMENT IN VENTURE CAPITAL COMPANIES

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ABSTRACT

Kalle Räty: Risk management in venture capital companies
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Venture capital companies are investment entities that focus solely on making investments in startups and early-stage growth companies, attempting to generate above-market returns by taking higher risks in their investments. Making investments in high-risk startup and early-stage growth companies means that venture capital companies have to implement sophisticated and robust processes to identify, analyze, manage and monitor wide variety of different risks associated with small and fast-growing companies that are often developing cutting edge technology and creating new innovative business models. In addition, venture capital companies also have to manage company level risks that are related to business operations and factors, such as reputation, capital raising process, financial contracting and exiting investments.

The purpose of this study is to understand how venture capital companies structure risk management strategy and processes on company level. Furthermore, the study attempts to identify what are the most important risks that venture capital companies face in their business and what methods and techniques venture capital companies use to mitigate those risks. The study was conducted using a qualitative research method and the research data was collected through semi-structured interviews in order to gain deeper understanding of the subject matter and the motivations of the interviewees. In total, four interviews were conducted. The interviewees were partners and employees in venture capital companies and other investment companies that had at least one active venture capital fund under their management. All of the participants were selected so that the sample would be as representative as possible. The questions presented were based on common risks and risk management methods found both in studies concerning venture capital investing and literature about venture capital risk management. They were designed to be semi-structured and open-ended so that it would be possible to gain in-depth information about the topics of the interview and to have the option to further explore any of the topics.

The findings of the study indicate that venture capital companies are able to manage their risks without creating a formal company level risk management strategy or complex company level risk management structures. Instead, the data shows that venture capital companies use standardized risk management frameworks for evaluating the risks and return potential of individual investments and that the venture capital industry has a fairly standardized set of notable risks and risk management methods that are used to control and mitigate those risks. The results also indicate that reputational risks, risks concerning insufficient or inadequate screening and due diligence processes and the risks of a premature exit transaction have the highest importance of direct operational risks, whereas on the risk management side, the most important methods for controlling and mitigating risks are portfolio diversification, thorough screening and due diligence processes, active monitoring of portfolio companies and careful financial contracting. The analysis of the data also reveals that most of the interviewed venture capital investors do not recognize company level risk management as a major differentiator or competitive advantage when raising capital for a new fund or sourcing new investment opportunities.

Keywords: venture capital, venture capital company, risk, risk management, portfolio, investment, startup, early-stage growth company

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1 INTRODUCTION

When one examines and compares different time periods and geographical areas from the perspective of welfare, it becomes obvious that economic growth is one the most important factors in creating welfare in a society. The bulk of this economic growth is created by businesses, which combine natural resources, labor and capital to create goods and services. However, some businesses create more economic growth than others. In the past, large corporations were responsible for most of the economic growth in developed countries, but in the 1970s and 1980s economic activity started to move away from large corporations to small companies. This trend has continued to grow over the years, and as a result small businesses have become an integral part of the economy in developed countries. (Wennekers & Thurik 1999) For example, in the United States 99.9 percent of all companies are small companies, and these small businesses accounted for 65.9 percent of net new job creation from 2000 to 2017 (https://www.sba.gov 2018).

An important subcategory of small businesses are startups. These companies differ from other small businesses primarily in willingness to grow the business at an accelerated pace. Startups, also called early-stage or emerging growth companies, try to design their businesses in a way that enables them to scale and grow the business very quickly. The pursuit for growth comes at a cost, as most startup businesses need considerably more funding to ramp up their operations and to achieve positive cash flow. The very short, or completely empty, operating history and negative cash flow result in startup companies not being eligible for business loans in most cases, which means that these companies have to sell equity to investors in order to finance their operations. Selling shares to an investor dilutes startup founders' ownership of the company, but at the same time gives a clear incentive for the investor to help the company to grow. The right investor can provide highly valuable contacts, partnerships, advice and professional services that accelerate the growth of the business. (Salamzaden & Kesim 2015)

The most notable challenge for startups and their investors is the fact that approximately fifty percent of startups fail in the first four of years of operation and seventy percent have failed after ten years from inception (www.bls.gov 2016). These failure rates demonstrate how operating and

investing in a startup company requires a considerable amount risk-taking. This high risk-level of startups and other small growth companies stems from financial and historical data that shows that these companies usually make very little or no sales at inception and are characterized by having business strategies and models based on hypotheses or based simply on a prototype. In addition, startups face a multitude of risks related to technical, financial, competitive, regulatory and managerial factors. Depending on the investors risk aversion, the considerable amount of risk inherent to startup companies can also be observed as a possibility, since risk and reward are most of the time highly related on the financial markets. (Salamzaden & Kesim 2015)

Due to the very high risk-return tradeoff of startup investing, a new group of private equity investment entities, called venture capital companies, started to emerge in the 1950s to offer a less risky way for large institutional investors and wealthy individuals to invest in early-stage companies by employing an investment strategy that focuses on making minority equity investments into a large amount of high-risk growth companies. This financing system for early-stage companies has given institutional investors and wealthy individuals, who are often called limited partners or fund sponsors in the venture capital industry, access to an asset class that has been historically producing higher returns on invested capital than the public stock markets. The average annual return for venture capital funds has been 27.99 percent during the last 30 years, whereas S&P 500, the most popular indicator for average annual stock market returns, has generated 9.69 percent return on average. (www.cambridgeassociates.com 2017; www.hbr.org 1998)

However, these significantly higher returns include increased amount of volatility compared to the S&P 500 and other stock indices. It is also uncertain if the venture capital industry is able to sustain such high returns in the future, as financial markets and the economy keep evolving into new directions. As an example of this uncertainty, the average annual return for venture capital investments in the last ten years has been 9.04 percent. During the same period S&P 500 has been able to produce almost the same level of returns with 8.50 percent average increase in value. (www.cambridgeassociates.com 2017) In addition to high returns, venture capital funds also provide diversification benefits to their limited partners as a result of venture capital's concentration on small growth companies which possess only little correlation with publicly traded

companies. The most important reason for this non-correlation is that venture capital investments in generally have little or no value until the portfolio company is either sold or taken public in an initial public offering. Before the final exit is completed, most venture capital companies do not record profit or loss from an investment unless it is viewed as worthless. (www.hbr.org 1998)

Just as the companies that receive venture capital are varied, the venture capital companies themselves are a highly heterogeneous group of investors. They differ in several various factors, such as investments strategies, motivations, approaches, size and location. Venture capital company's investment strategy outlines the general investment thesis, which often includes information on how large individual investments and at what part of the business cycle investments the company is looking to make. Expected return on investment, exit strategy and possible specialization on specific industry are also regularly defined in venture capital investment strategies. In addition, different motivations and approaches of the venture capital company's managers and limited partners can influence the investments thesis. Some venture capital investors actively offer help and guidance to their portfolio companies, whereas others act mostly as passive investors. (Ramsinghani 2014) During the last few years, venture capitalists have also become more aware of social issues such as diversity and equality, which therefore have slowly started to gain a foothold in the venture capital industry. For instance, the amount of women and minority-owned venture capital companies has steadily grown, and at the same time venture capital investors are increasingly looking to fund early-stage growth companies that are owned by minority entrepreneurs. (www.fairviewcapital.com 2017)

In most instances, the size of a venture capital company is measured by the amount of capital it has raised from its limited partners. Some venture capital companies raise a few million dollars, whereas others raise hundreds of millions, or even billions of dollars' worth of capital. Factors such as previous success, investment strategy and vision, physical location of the venture capital company and the condition of local and international financial markets affect how much capital they are able to raise from limited partners. (Cumming et al., 2005) This capital is divided into separate venture capital funds, which usually have a fixed ten-year maturity period. The capital invested in a fund is invested in the first 2-3 years from the inception, after which the venture capital company focuses on managing and making possible follow-up investments to the portfolio

companies. The actual transaction of capital from limited partners to the venture capital fund is done subsequently over time as the fund starts investing in companies. (Kuckertz et al. 2015)

In addition to the aforementioned differences between venture capital companies, physical location of the company as well is a major differentiator in venture capital industry and has a significant impact on the raising and investing processes of a venture capital fund. In the modern globalized world, venture capital companies could diversify their investments geographically, but several studies (Kang et al. 2017; Zook 2005; Florida & Smith 1992) have shown that venture capital investing is characterized by behavior which prefers investing in businesses that are geographically close to where the venture capital companies themselves are located. Most venture capital companies are clustered in a few major cities and financial centers in high tech regions, such as San Francisco, Boston, London, Toronto, Beijing and Shanghai. These areas draw venture capital as a result of high concentration of young growth-stage companies and access to pools of highly educated and experienced professionals. Venture capital companies require these resources in order to source lucrative investment opportunities, build social networks, support portfolio companies and organize investments. (Mason 2007)

Investing solely in high-risk startup companies, means that venture capital companies have to have sophisticated and robust processes to identify, analyze, control and monitor wide variety of different kind of risks related to small and fast-growing companies that are often working with cutting edge technology and creating new innovative business models. Venture capital risk management is usually divided into pre-investment and post-investment stages, which both have different set of risks and risk management techniques. During the initial pre-investment stage venture capital financiers focus on identifying and evaluating risks such as agency and market risks, financial risks, macro-level risks, product development risks and risks related to management's performance. To mitigate these risks, venture capital companies are using multiple different risk management methods, which include conducting pre-screening and due diligence, making contractual provisions and clauses that protect the investor, joining together with other investors to create a syndicate that shares the investment and dividing the investment into several stages that are connected to milestone events. (Kut et al. 2007; O. Fiet 1995)

The post-investment stage of venture capital investing is comprised of continuous monitoring of risks and other crucial key indicators and supporting portfolio companies to grow their businesses. Furthermore, venture capital investors also use monitoring to attempt to correct potentially harmful behavior by founders and management teams. According to study conducted by Kut, Pramborg & Smolarsk (2007), venture capital companies perceive management related risks, such as lack of performance and focus, to be to most important risks for existing portfolio companies. To reduce the overall risk of their investment portfolios in the post-investment stage, venture capital companies often diversify their investments across different industries, geographic locations and investment stages. Comparing correlation between companies in portfolio and comparing correlation between portfolio and the stock market is also another risk management method that assists venture capital companies to assess portfolio concentration risks. (Manigart & De Clercq 2007; Kut et al. 2007)

Despite of the pre-screening, due diligence and risk management processes, venture capital investing always involves a significant amount of risk, which can only be minimized but can never be completely removed. This fact is backed by statistics that show how only four percent of venture capital investors' portfolio companies produce most of the returns, while sixty-five percent of portfolio companies produce negative returns and twenty-five percent modest returns (www.invesco.com 2016). This means that in order to give their limited partners higher returns on their capital compared to the public financing markets, venture capital companies need to find and invest in extremely successful early-stage companies that can increase the value of invested capital by several multiples. For example, a venture capital fund that lasts approximately 10 years has to at least triple in value before the fund's maturity date to beat the annual average return from the stock market (www.cambridgeassociates.com 2017).

As a result of this "hit-or-miss" structure of venture capital funding, venture capital companies have to be very selective in choosing which companies they fund, and thus they screen hundreds or even as many as a thousand deals per year to have a realistic probability to discover even a handful of high-potential early-stage companies. In order to increase the likelihood of discovering the most potential early-stage companies, venture capital companies analyze and monitor a matrix of varying industry sector characteristics, some of which include, how long it takes on average for

pre-revenue companies to start producing revenues in different sectors, the expected revenue-to-expense ratio in relation to required amount of capital and time, and at what stage of a company's development cycle should an investment be made to gain the greatest possible return on investment. (O. Fiet 1995; www.tuck.dartmouth.edu 2003)

1.1 Background of the study

Some actions and inactions have a chance to create a situation where value can be either gained or lost. This event is called risk, and even though it can have positive or negative realization, it is usually associated with situations where value is lost. Risks are present in almost every aspect of any activity, and they can be either planned or unplanned. According to Tchankova (2002), risks can be classified into seven different distinct sources, which are physical, social, political, operational, economic, legal and cognitive environment. Regardless of the risk source, risk is always attached to some level of uncertainty, which means that it has a possibility to be realized, but there can be no absolute certainty of the realization. Due to the loss of value from realized risks and uncertainty created by known risks, it is crucial to implement measures to control risks and mitigate their effects. This control and mitigation of risks is called risk management; it is a process that identifies, evaluates, analyzes, prioritizes and monitors risks and allocates resources to reduce their probability and impact. (Kaplan & Garrick B. John 1981)

The first stage of the risk management process, called risk identification, is an integral part of any kind of risk management. Non-identified risks are not known, which means that they cannot be properly assessed and controlled. These unknown risks can have very unexpected consequences because of the reason that it is not possible to prepare for these kinds of risks. As a result of this significant threat that non-identified risks pose, it is crucial for organizations and individuals to attempt to identify all possible risks. In organizational context, risk identification requires inspection of all organizational activities and processes in all functions of the organization and at every managerial level. External and internal changes in the environment create new risks continuously, which means that risk identification has to be a constant process that proactively identifies new risks. Correct and thoroughly done risk identification reveals and determines the

possible risks and creates a solid foundation for the rest of the risk management process and ensures its efficiency. (Tchankova 2002; https://www.mitre.org 2018a)

The second stage of risk management process is evaluation of identified risks. It can be defined as a process by which organizations and individuals determine how acceptable any given risks are. In its simplest form, risk evaluation can be seen as a process that categorizes all identified risks either as acceptable or unacceptable. Risk analysis, another part of the risk management process, is used in conjunction with risk evaluation to gather information regarding risks that are under the evaluation process. The objective of risk analysis is to provide adequately detailed information to facilitate risk evaluation process to properly evaluate identified risks. The two main factors analyzed and evaluated at this point of the risk management process are the probability of occurrence and expected consequences of a risk. If a risk is seen as acceptable, it does not require further action other than regular monitoring. But when a risk is qualified as an unacceptable, it requires an adequate action that reduces the risk to a level that is deemed acceptable. Depending on the preferences of the organization or individual and the intrinsic qualities of the risk, it can be lowered by either reducing its probability, mitigating its consequences or completely removing it. (Klinke & Renn 2002; https://www.actuarialstandardsboard.org 2012)

After identified risks have been divided to acceptable and unacceptable, the latter group is separated into different categories based on the urgency of the need to control and mitigate specific risks. This phase of the risk management process is called risk prioritization analysis. An organization or individual has limited amount of resources to deploy for risk management actions, which means that in most cases it is not possible to designate all identified unacceptable risks with equal measure of risk management actions at the same time. The main purpose of prioritization process is to guide this deployment of risk management actions and form a basis for optimal resource allocation. There are multiple quantitative and qualitative methods and techniques that can be utilized to facilitate the prioritizing process. Quantitative methods include techniques such as probability distributions, sensitivity and simulation analyses, expected monetary value analysis and weighting of consequence, probability and timeframe in cardinal risk evaluations. Qualitative techniques for prioritization include analysis of probability and impact, categorizing of unacceptable risks, ranking risks with multiple impacts according to frequency, forming impact and probability

matrixes and creating assessments that measure the urgency of unacceptable risks. Different risk prioritizing techniques have different advantages and disadvantages depending on the situation, therefore prioritization has to be a continuous process that factors in relevant external and internal variables in order to develop optimal combination of risk prioritizing techniques for varying circumstances. (https://www.mitre.org 2018b)

When risks have been identified, evaluated, analyzed and prioritized, risk management process advances to the risk mitigation stage. The ultimate purpose of risk mitigation process is to reduce the probability that a risk will occur, diminish the impact of a risk that has realized and, in some cases, remove the risk completely. However, before the implementation of actual risk management actions takes place, a risk mitigation strategy is commonly created for an effective and coordinated execution of said risk management actions. Risk mitigation strategy typically contains information about determined root causes of previously analyzed risks, alternative options for mitigation methods and tools for the most critical risks, assessments and prioritizations of mitigation alternatives, estimates of required resources for specific risk mitigation actions and plans for communication of risk mitigation to all stakeholders of the risk management process. In accordance with the previous stages of risk management process, risk mitigation planning is an ongoing effort that requires regular adjustments as external and internal variables, that affect organizations or individuals, shift. (National Research Council 2005)

An adequate strategy for implementing risk mitigation actions provides a basis for the operational stage of risk mitigation process. The four most common types of risk mitigation actions used in this operational stage of risk mitigation process are risk avoidance, transfer, control and acceptance. The first class of risk mitigation actions contains techniques that attempt to avoid risks completely. The concept behind risk avoidance is that, in many risk situations and environments, the most effective method to protect against unaccepted risks is to try to avoid them completely. In most instances, risk avoidance means a refusal to engage in a certain activity or activities that are perceived or known to bear risks that the organization or individual is not willing to take. Albeit risk avoidance is simple and powerful risk mitigation method, it does carry a significant drawback in lost opportunities, lost positive risks and the loss of events and situations that could have had favorable aspects to an organization or individual. For the aforementioned reasons, using risk

avoidance as a risk management action to mitigate risks typically requires a careful analysis of the advantages and disadvantages created by avoiding any given action. (National Research Council 2005)

If risk avoidance is not possible or beneficial, another option to attempt to completely remove a risk is to transfer the risk to another party. In this risk mitigation method, an organization or individual shifts an individual risk or a group of risks to a party that is willing to carry those risks. Usually this kind of exchange requires that the risk-taking party is adequately rewarded for the transfer. The most common form of risk transfer is by means of an insurance policy. Risk transfer through insuring typically happens via voluntary arrangement, where one party agrees to pay another in exchange for protection against financial losses caused by those risks that the insuring party has agreed to insure. By using insurance, it is possible for organizations and individuals to transfer specified risks of loss to other parties that are more capable to manage those possible financial losses. Another way to utilize risk transfer as a risk mitigation method is through non-insurance agreements such as contracts, warrants and futures. An important distinction between insurance agreements and non-insurance agreements is that an insurance policy does not transfer the risk itself, but only the financial losses caused by it, whereas non-insurance agreements typically transfer the whole risk and its possible impact. These non-insurance agreements can have a multitude of provisions, clauses, conditions and terms that transfer risks from one or more parties to other another party or parties. (Mullai 2006; National Research Council 2005)

In addition to the above-mentioned non-insurance agreements, outsourcing is another notable, and often contract-based, method to transfer unwanted risks. When an in-house service or function is outsourced to an outside party, risks attached to those services and functions are also transferred to the outsourcing provider. However, in most instances it is not possible to completely remove risks by using outsourcing; for example, risks related to the interruption of supply are often retained in some extent by the outsourcing party. Using risk transfer as a risk mitigation method can be entirely appropriate when all involved parties are fully aware of the risks and rewards of the exchange. The risk-assuming party chooses to carry another party's risks because it has skills, knowledge or other attributes that it can utilize to reduce the transferred risks. When these conditions are met, it is

economically efficient and rational to transfer the risks, as each of the parties participating believe that they are better off after the exchange than before. (Söderlind 2007; Mullai 2006)

Risks that cannot be removed completely by using risk avoidance or transference have to be retained. An organization or individual can either try to control these unavoidable risks through different mitigation techniques or simply accept them. The former option is typically called risk control; it is a risk mitigation method that attempts to reduce, mitigate or manage the probability and impact of retained risks. The total risk exposure of a risk can be calculated, as a rough approximation, through multiplying its probability by the potential impact or damage incurred by the occurred risk event. Most often the main objective of risk control process is to reduce the total combined risk exposure of all identified risks by implementing risk control actions that reduce either probability or impact, or, in some cases, both at the same time. Extensive risk analysis and risk mitigation strategy facilitate and guide the most effective allocation of risk control resources for a maximal reduction of the total combined risk exposure. In addition, risk control process has to constantly compare the costs of risk control actions with the projected return on investment of those risk control actions to be able to make decisions that ensure the most efficient use of capital. (Söderlind 2007; Mullai 2006)

The other option for controlling risks that cannot be avoided or transferred, or these methods are not financially feasible, is to accept them. This method is called risk retention, and it is typically recognized as the last resort of risk mitigation methods. In a situation where all the other risk mitigation methods are either inadequate or incur costs that are too high, risk retention is the only option for an organization or individual to move forward with the desired action or inaction. Acceptation of specific risks requires thorough analysis and evaluation of the retained risks in order to chart all the possible consequences that they could cause. Failure to accurately assess accepted risks may result in underestimating the potential losses, which in turn creates dangerous vulnerabilities where the organization or individual is not aware of these potential losses, and thus is not able to prepare for their occurrence adequately in advance. When accepted risks and their consequences are fully understood, it is possible to make an informed decision about the use of risk retention by comparing the potential gains and losses of taking the action or inaction related to

accepted risks with a situation where the risks are not accepted and the action or inaction is not taken. (Söderlind 2007; National Research Council 2005)

Risk monitoring is the final stage of risk management process; its purpose is to ensure that changes in existing risks are observed and evaluated correctly and that new risks are identified promptly. In addition to tracking new and existing risks, risk monitoring also measures the effectiveness of the risk management strategies, processes and risk mitigation actions which are implemented by an organization or individual. The process of monitoring risks and effects of risk mitigation actions is a crucial part of risk management process due to the fact that organizations, individuals and their environments are never static, and because of this, the risks related to these factors do not stay constant either. Risks that have been already identified can be monitored in order to recognize and identify potential emerging trends in their probabilities and consequences. The constant change does not just alter existing risks, but also creates completely new risks factors that can have significant consequences. To identify these risks, it is necessary to observe changes both in macro level factors, such as economy and international politics, and in micro level factors that directly affect an organization or individual. When changes are identified in the aforementioned factors, risk evaluation and risk analysis processes are updated correspondingly. The findings of risk monitoring processes can be utilized as a guidance to readjust existing strategies which may have proved to be inaccurate or ineffective and create new strategies for improved risk management processes. Furthermore, risk monitoring can help to reveal whether adequate guidelines and policies were followed, whether implemented risk mitigation actions are as effective as expected or whether risk assumptions made previously are still valid. (Hallikas et al. 2004; https://www.loc.gov/ 2015)

1.2 Research questions and limitations

The purpose of this study is to understand how risk management is planned and conducted in venture capital companies. In addition, this study pursues to learn what kind of risk management strategies venture capital companies use and how important role risk management has in different stages of venture capital companies' business processes. The main research question of this study is as follows:

1. How do venture capital companies structure risk management strategy and processes on company level?

The sub-questions of this study are as follows:

1. What are the most important risks that venture capital companies face in their business?
2. What methods and techniques venture capital companies use to mitigate risks?

The unit of analysis of this study has been limited to venture capital companies and funds, which are a sub-asset class of private equity investments. Private equity is an asset class comprised of capital that is invested in entities that are not listed on any public stock exchanges. It focuses on long-term value creation through active ownership that involves constant focus on identifying and introducing measures that create and add value, acceleration of long-term growth and implementing operational improvements with lasting effects. Private equity includes investment strategies such as leveraged buyout, growth capital, venture capital, mezzanine financing and distressed debt. The research limitation to venture capital has been made due to the reason that venture capital industry has significantly larger amount of individual companies, separate funds and available data compared to other private equity investment vehicles.

The second limitation of this study is the process of risk management, which is one of the business functions that enterprises and other business organizations establish and operate to carry out their mission and strategy. Business functions can be grouped into core functions and support functions. Core functions relate most directly to the basic business of the enterprise, whereas support functions facilitate the operation core business functions. (Brown P. 2008) Risk management process can be its own business function or integrated into other business functions, depending on factors such as industry, organization and business model. The decision to limit business functions to only risk management process was made because of the inherently high-risk business model of venture capital and the lack of prior research studies on company-level risk management in venture capital companies.

The third limitation of the study regards the perspective of examination. A venture capital company can be examined on three different levels; company level, fund level and portfolio company level. A company level perspective examines investment funds and individual investments as a whole, whereas a fund level perspective only considers individual investment funds and portfolio company level respectively individual investments. (Ramsinghani 2014) Due to the fact that the purpose of this study is to understand how venture capital companies are structuring risk management processes on company level, this study does not focus on examining the risks and risk management processes that solely concern individual venture capital funds or portfolio companies. A Venture capital company's investment portfolio, which typically consists of all the ownership stakes it currently holds in various companies, is primarily examined on company level as a single entity that is subject to risks and risk management processes.

1.3 Definition of key concepts

Private equity – Private equity is a part of the alternative assets class, which also includes hedge funds, real estate, derivatives and natural resources. It is capital that has been invested in privately owned companies in exchange for an ownership stake. Investments in private equity are highly illiquid, and thus are held for considerably long periods of time. (Ramsinghani 2014)

Venture capital – Capital invested or available for investments in ownership stakes of startup companies and other early-stage companies that are seeking to grow rapidly. Also called risk capital. (https://www.nasdaq.com 2018a; https://www.merriam-webster.com 2018a)

Venture capital company – A private company that provides capital to startup companies and other early stage companies in order to accelerate their growth or bring new products or technologies to market. Venture capital companies pursue to generate returns that exceed the average stock market returns by taking higher risks in their investments. (Ramsinghani 2014)

Venture capital fund – An investment vehicle that pools funds from third-party investors, generally from institutional investors and high net-worth individuals, to invest in startup companies

and other early-stage companies that are identified to have strong growth potential. Venture capital funds are raised, invested and managed by venture capital companies. (Ramsinghani 2014)

Portfolio – A collection of investments held by an organization or individual. A portfolio can contain financial assets such as stocks, bonds, commodities, currencies and cash equivalents or alternative assets like real estate, art, private investments and other investments that are not publicly traded. (https://www.nasdaq.com 2018b; Ramsinghani 2014)

Startup – A newly established business that seeks to solve a marketplace need or problem through a business model that is repeatable and scalable. (https://www.nasdaq.com 2018c; Ramsinghani 2014)

Growth company – A company that is growing faster than other companies in the same field. Growth companies typically invest aggressively in future growth by directing a high proportion of generated income back into the business. In most situations the growth is driven by an innovative product or service that has more attractive value proposition than competing solutions. (https://www.merriam-webster.com 2018b; https://www.nasdaq.com 2018d)

General partner – A participant who has unlimited liability for the obligations of a partnership. In venture capital, general partners serve as the managers of the venture capital company. General partners make the investment decisions on behalf of the venture capital funds that they are managing. (https://www.nasdaq.com 2018e; Ramsinghani 2014)

Limited partner - A partner who has limited legal liability for the obligations of the partnership. In venture capital, investors of venture capital funds are called limited partners. Most limited partners are either institutional investors such as pension funds, endowments and other financial institutions, or high net-worth individuals and family offices. (https://www.nasdaq.com 2018f; Ramsinghani 2014)

IPO – Initial public offering. A company's first sale of shares to the public stock markets. When a private company completes an initial public offering it becomes a public company that is traded on

a stock exchange. The shares that are offered to the public in an initial public offering can be either issued by the company or sold by the existing investors. In the latter situation company is raising new capital and diluting existing shareholders, whereas in the former situation only the ownership structure of the company is changed. (https://www.nasdaq.com 2018g)

Investment strategy – A plan that describes investor's risk averseness, principles of capital allocation among different investment vehicles and future needs for capital. Investment strategy is combined of rules, procedures and predetermined actions, which are designed to create a framework to guide and facilitate the selection of suitable investments. (https://www.nasdaq.com 2018h)

Due diligence – A comprehensive examination and inspection of a business, conducted by a prospective investor or acquirer. Due diligence is a multi-step process that evaluates assets, liabilities and commercial potential of a business in order to enable a potential buyer or investor to make an informed decision. (Ramsinghani 2014)

Risk management – The process of identifying, analyzing, evaluating, prioritizing, controlling and monitoring risks. Risk management is a process and a mindset that has to involve the whole organization and all its processes to create an effective and robust system for managing risks. (https://www.thefreedictionary.com 2018; https://www.chapman.edu 2006)

Risk mitigation – A systematic process to reduce risk exposure by lowering the probability of a risk occurring and/or reducing the amount of negative consequences of a risk. Often used risk mitigation methods include risk avoidance, risk transfer, risk control and risk retention. (https://www.chapman.edu 2006)

Risk management action – An action that is intended to avoid, transfer or control a specific risk or group of risks. Actions such as divestment of a business unit, shutting down a product or service, outsourcing operations, contract making, insuring, increasing workplace safety and guarding against cyber-attacks are typical examples of risk management actions. (https://www.chapman.edu 2006)

1.4. Research methodologies and material

In order to carry out the study in an adequate manner and satisfy the previously defined objectives, a qualitative research methodology was chosen as the appropriate means to conduct this study. A qualitative research methodology provides an opportunity for a comprehensive in-depth study of risk management processes used in venture capital companies and allows the research to investigate the motivations behind these risk management processes. In addition, the relative scarcity of venture capital companies and the complex composition of different risk management processes further supported the choice of qualitative research method.

The qualitative research method of semi-structured interviews was selected for collecting the research material for the study. This approach aims at obtaining rich descriptive information about the knowledge and personal experiences of the interviewees for the purpose of understanding the significance of risk management processes on company level in venture capital companies. In addition, semi-structured interviews encourage two-way communication and allow the interviewees to express their views freely in their own terms, and thus, open the opportunity for the interviews to provide not just answers, but the reasons for the answers.

The aim of the interview process is to interview approximately three to six partners or employees from different Finnish venture capital companies. The interviews consist of a list of predetermined questions and topics that guide the interview, but the open-ended nature of the questions simultaneously provides the opportunity for identifying new perspectives of understanding the topics at hand. The interviews will be conducted either in-person or over the phone.

1.5. Previous studies

Although there is an abundance of research and studies done on venture capital and risk management separately, there is only a relatively moderate amount of existing research and studies of recent origin that examine how venture capital companies integrate different risk management

processes into their business processes on company level. Some of the previously conducted research has focused on how venture investors conduct their business and how significant role risk management has in their daily activities. Moreover, different sub-sections of risk management in the private equity sector have been the focus of a few other studies. As an example, these sub-section studies have examined the different aspects of syndication, contracting, agency costs and the use of convertible securities. One notable observation of venture capital risk management research is the fact that, even though international research on the subject matter of venture capital risk management is starting to emerge with increasing frequency, the research is still quite US-centric. The data used in these studies comes mostly from United States and China.

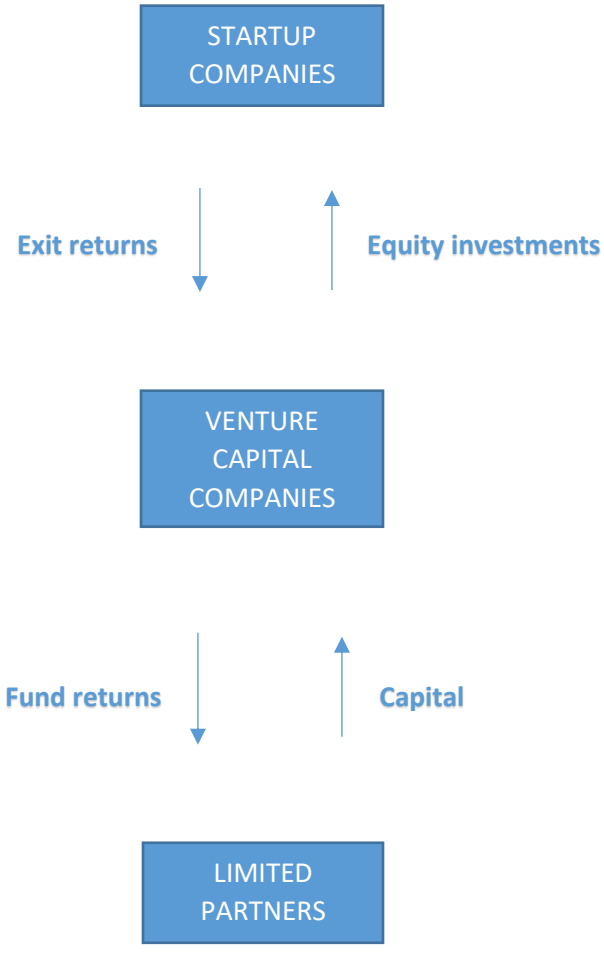
One of the most well-known studies done on venture capital risk management is done by James O. Fiet (1995), where he examined how market risk and agency risk affect decision making in venture capital companies. The study presented statistically significant evidence that venture capital companies viewed market risks as considerably more important than agency risks due to standardized contractual provisions that provide venture capital companies effective protection from most agency risks. Another finding of the study was that venture capital companies tend to selectively acquire information about different types of risk, because specializing in the collection of a specific type of risk-reducing information reduces their costs through the development of economies of scale. In accordance with these findings, the study additionally found out that venture capital firms specialize more in market risk than agency risk.

Other influential study on venture capital risk management was conducted by Can Kut, Bengt Pramborg and Jan Smolarski (2007). In their study they analyzed how a range of different risk management methods, including portfolio risk mapping, pre-screening and post-investment monitoring, are used by venture capital companies to control and mitigate different risks that are inherent in venture capital investing. The main findings of the study were that (a) investment pre-screening and risk monitoring in existing portfolio companies is highly important to venture capital companies; (b) traditional investment portfolio hedging is less important to venture capital companies; and (c) project-specific risks vary according to the type of the investment vehicle used; for example, venture capital funds and buyout funds are exposed to distinct ranges of risks due to their differing investment strategies. Based on the results of the study, Kut, Pramborg and

Smolarski suggested that venture capital companies should use generally available standardized tools during the post-investment and portfolio monitoring stages to a greater extent, which could potentially create significant improvements in their return distributions. The researchers also proposed that limited partners should demand the use of standardized post-investment risk management techniques from venture capital companies in order to ensure that they operate as efficiently as possible.

1.6 Theoretical framework

1 The flow of capital in venture capital industry



The figure above depicts how capital moves through the venture capital ecosystem. The underlying chain of events starts from the pool of capital owned by institutional investors and high-net-worth individuals. These investors, called limited partners, allocate a part of their capital pool, typically couple percent of the total investable capital, to venture capital funds that are managed by venture capital companies. When the capital has been allocated to venture capital companies, they start distributing it to businesses by making equity investments in the most promising startup companies that are looking for capital to accelerate their growth. Startup companies in turn invest the capital in activities such as research and development, sales, marketing and hiring more employees, hoping to create a business that can provide a meaningful return to the investors and founders of the company.

The invested capital starts to flow back to venture capital companies and limited partners usually when a startup is either acquired by another company or it goes public with an initial public offering. Only a small amount of startup companies reach these investment exit events, and even if they do, only a minority of those exits are meaningfully profitable. In some cases, it is also possible for the investor to the sell the ownership stake in a startup company to another investor on a secondary shares market. After the liquidation of the investment, the capital moves back to the venture capital company, which takes a cut of the capital if the investment was able to generate a large enough return. Rest of the capital moves back to the pool of capital owned by limited partners, and the process of allocating capital repeats.

2 VENTURE CAPITAL RISK MANAGEMENT

To be successful in the business of venture capital, is most often understood to require a combination of strong educational and professional background, industry expertise, excellent human skills, extensive professional networks and a strategic “CEO perspective” mindset. In addition to these essential personal attributes, successful venture capital companies need to create a well-organized investing entity that has solid corporate governance and effective and efficient core and support business functions. (Smart et al. 2000) Risk management is one of these crucial

business functions, but due to the inherently risky nature of venture capital, the need for a robust risk management function that is embedded in all operations is particularly necessary for venture capital companies. Proper risk management processes and tools lessen the negative effects of asymmetric information, reduce the amount and severity of unsuccessful investments and ensure that investment portfolio concentration risks are thoroughly identified and evaluated. Moreover, effective and systematically organized risk management is an important factor for limited partners in their investment making decision process; conversely, inadequate risk management processes can drive away limited partners from investing in a venture capital fund. (Proksch et al. 2016)

The following section of the study utilizes existing literature and studies on risk management in venture capital companies to provide a comprehensive analysis of the risks in venture capital investing and risk management techniques venture capital investors are using to mitigate those risks. The section begins with examining the most significant and frequent risks venture capital companies encounter in their business; the examination is conducted through the perspective of several primary business functions that comprise the core of venture capital investing. After identifying and explaining the risks inherent in the business of venture capital, the section proceeds to observe and analyze multiple different risk management techniques used by venture capital companies to mitigate and avoid risks previously presented in the risk portion of the section.

2.1 Risks in venture capital financing

The risk environment of a venture capital company is a complex, multifaceted and differs in many ways from companies that produce and sell services or products. Not only are venture capital companies subject to all the business related risks that their portfolio companies face, but in addition they have a slew of other risks related to factors such as investment processes, relationships with LPs and investment liquidation events. For the purposes of this study, these different venture capital business processes are divided into four distinct operating processes that hold their own set of risks; (a) raising funds, (b) investing funds, (c) managing portfolio and (d) exiting investments. (Ramsinghani 2014; Ørjan 2011) This process flow structure describes the comprehensive operation and lifecycle of a venture capital fund and the risks associated with the different operational phases during the lifecycle of a venture capital fund in a chronological order. Other

risks that are not clearly connected to any of the above-mentioned operating processes, such as risks related to general administrative tasks and interpersonal conflicts, are examined in their own chapter. (Proksch et al. 2016)

2.1.1 Risks associated with raising capital

Although a venture capital company is most often the more dominant party who is being pitched in funding negotiations, this situation is reversed when the venture capital company is starting a new fund. The process of raising funds has many parallels to the capital-raising process for startup companies; general partners of the venture capital company develop an investment strategy, compelling story and a pitch deck, which are then presented to targeted institutional investors for the purpose of raising capital. The fund-raising process can last as long as 18 months, depending on factors such as previous experience of the general partners and the investment team, market opportunity of the investment strategy, track record of successful investments and current portfolio companies in previously raised venture funds. The longer the funding takes, the higher the risk for the effort to fail; any potential investors want to know how long the capital raise has continued and how much of the total size of the fund has been committed or raised in order to evaluate the momentum and likelihood of successful closing of the fund. Slow progress in raising funds is a warning sign for many potential investors, and thus a major failure risk in raising a venture capital fund. (https://ilpa.org 2018; Ramsinghani 2014)

Raising investment capital can be particularly challenging for venture capital companies that are raising their first venture fund and do not have general partners with past success in either founding companies or making venture capital investments. According to a study conducted by PitchBook (2018), debut fund venture capital companies that had operational and venture capital investment experience in their management, were 14 percent more likely to raise a second venture capital fund compared to those first-time venture capital companies that did not have any operational or venture capital investing experience. Most large institutional investors perceive first-time funds and new managers as a too risky investment and prefer experienced investors and venture capital companies with a strong track record of previous successes. As a result, the managers of first-time funds usually focus their capital raising efforts on high net worth friends, colleagues, family members

and other wealthy individuals or organizations in their respective networks. Venture capital companies with several successful funds and experienced general partners, in turn, are generally able to raise funds from large institutional investors, such as pension funds, endowments, fund of funds and foundations. The venture capital funds of the largest and most famous venture capital companies are such in-demand that these companies can choose their limited partners and raise capital for a new fund in a matter of weeks. The high demand from institutional investors also gives these venture capital companies significant leverage to ask for larger share of the profits and other advantageous contractual provisions that reduce the risks in capital-raising process. (https://ilpa.org 2018; Kuckertz et al. 2015; Ramsinghani 2014)

Most venture capital funds have a fund-raising process that includes two different fund closings: the first close and final close. The process of first close typically occurs when approximately 40-70 percent of the total size of the fund has been committed by investors. When the first close has been completed, general partners of a venture capital fund can start making investments at the same time as they are raising the remaining amount of capital to reach the target size of the fund. In the event that the remaining capital is successfully raised, the venture capital fund will conduct the final close, which concludes the fund-raising process and no new investors are admitted to the fund. In order the achieve the first or final close and receive the committed capital, the venture capital company is required to finalize and circulate private placement memorandum, general partnership agreement, limited partnership agreement, subscription agreement and respective side letters to all closing investors. The involvement of multiple parties and complex orchestration of multiple legal agreements makes the closing process vulnerable to delays and other unexpected issues. Consequently, procrastinating investors pose a notable risk to the closing process and in many cases cause waste of time and resources. In terms of risk management, the first close is a crucial milestone that greatly reduces the risk of failure. Even if the fund does not reach the target amount and conduct the final close, in most cases it will continue operating and investing with the capital it has raised in the first close. (Ramsinghani 2014; Rosenberg 2002)

The risk of unsuccessful capital raise is also affected by factors such as the targeted size, sector, investment stage and geography of the fund. The size of the fund is ultimately determined by its investment strategy, construction of portfolio, target sectors and capital needs to maintain fund

ownership. As the size of the fund grows, so do the risks related to the capital-raise process. In general, the amount of previous successful funds and the level of experience of the general partners are the two most important factors that determine how large a fund a venture capital company is able to raise. Another essential capital raise risk factor is the sector of investment, which defines the industries, markets and types of businesses that the fund targets. Different sectors, industries and markets display unique key characteristics, such as volatility, growth prospects, capital requirements and profitability, which may either increase or decrease the risk of unsuccessful fund-raise, depending on how potential limited partners perceive the attractiveness of these key characteristics. For example, technology sector offers exposure to strong growth and volatility, whereas utilities sectors offers stability and relatively high dividend yields at the cost of low growth rates. Correspondingly, different markets and industries inside a specific sector either attract or repel potential limited partners, and hence affect the capital raise process and its failure risk. (https://www.fidelity.com 2018; Ramsinghani 2014; Rosenberg 2002)

In addition to size and sector, potential limited partners take into account the targeted investment stage and geography in their investment decision-making process. The different stages of investment, seed, early and growth, require different amounts of capital and provide varying risk-return profiles. Typically late-stage and growth-stage funds raise more capital than funds that focus on seed-stage and early-stage investments, but that does not necessarily mean that late-stage and growth-stage funds are exposed to higher fund-raising failure risk compared to seed-stage and early-stage funds. Funds that target late-stage and growth-stage investments are most often started by venture capital companies with strong track records and experienced general partners, which, as previously stated, significantly reduce the risk of unsuccessful capital raise. However, if past performance is excluded in the observation, the less complex and fewer individual investors requiring capital-raising process of seed-stage and early-stage venture capital funds can be perceived to generate less risk exposure. (Kuckertz et al. 2015; Elango B. et al 1995)

Geographic location plays an important role in both sides of venture capital funding; fund raising conducted by venture capital companies as well as startup companies is always influenced on some level by the location of the entity raising funds. In their study, Chen et al (2010) found that venture capital companies located in San Francisco, New York and Boston outperform and generate higher

return on investment and internal rate of return compared to venture capital companies in other U.S. cities. In another study observing the same geographical effect, Lindström (2006) discovered that the aggregate performance of venture capital companies has been lower in Europe than in the U.S. As a result of this geographic disparity between venture capital investment returns, potential limited partners are more interested in providing capital to venture capital funds that are managed by venture capital companies located in metropolitan areas with thriving startup ecosystems. Consequently, the attempt to raise capital for a venture capital fund in a remote location that lacks the tangible infrastructure, intangible infrastructure and network of organizations, which interact as a system that facilitates startup companies to scale their business fast and efficiently, has a higher risk of failure compared to the aforementioned metropolitan areas with strong startup ecosystems. (Chen et al 2010; Mason 2007)

In addition to internal factors and determinants of a venture capital fund, external macroeconomic factors influence the process of raising capital and the risks associated with it. The general condition of financial markets is a crucial component in raising capital from potential limited partners; in favorable market conditions available capital is more abundant and sentiment towards riskier investments among potential limited partners is more positive. Comparably, weak market conditions hinder the capital-raising process for venture capital funds and increases the risk of an unsuccessful fund raise. The importance of market timing and utilization of the so-called “window of opportunity” is also strongly correlated with the size of the capital raise, which means that large capital raises from large institutional investors are more sensitive to present market conditions than smaller raises from high net-worth individuals and small or medium-sized organizations. (Ramsinghani 2014)

Another less recognized risk associated with venture capital fund raising is reputational risk. Reputation is particularly important in the venture capital industry due to a large number of competitors and weak market concentration. Strong reputation attracts more investment opportunities and capital from limited partners. In this context reputational risk refers to the risk that a limited partner in a venture capital fund suffers or has previously suffered reputational risk that impacts the venture capital company that is managing the fund. These indirect reputational risks are often very difficult to predict and can occur suddenly without any warning, causing

significant damage to the venture capital company and all its stakeholders. Capital-raising reputational risk can also occur if limited partners' backgrounds are not properly investigated, exposing the venture capital company to indirect reputational risks stemming from the historical conduct of said investors. In the event that indirect reputational risk is materialized, the capability of a venture capital company to raise additional capital and make investments can be severely hampered. Additionally, the occurred reputational risk can also spread to venture capital company's portfolio companies and cause damage to their sales and brand value, which, in turn, causes even more damage to the venture capital company through declining portfolio company valuations. (https://hbr.org 2018; Khrishnan et al 2007)

2.1.2 Risks associated with making investments

When a venture capital company has conducted the first close of a new fund, it shifts to an investment period and commences the investment process. The investment period typically lasts from three years to five years, during which the venture capital fund actively seeks to make investments according to its investment strategy and generate target returns. Successful completion of a venture capital investment requires the deal to progress through a process that has multiple stages. The actual investment process can be divided into three different phases: (a) sourcing and screening investment opportunities, (b) conducting due diligence and (c) negotiating investment terms and closing the investment. The investment process starts with sourcing and screening potential investments; this means that a venture capital company uses multiple different sources to find large amounts of early-stage growth companies and identifies individual attractive companies from these large groups of companies. The most common high quality sources of investment opportunities typically exist within social networks that venture capital company's general partners have created over time. These networks consist of entrepreneurs, peer investors, attorneys, industry experts and other individuals who regularly work or communicate with new fledgling businesses. Other investment sources include different startup accelerators and incubators, angel investor networks, banks and other financial institutions, corporate spinouts and university technology transfer offices and research labs. In addition, events such as trade conferences, business plan competitions and startup pitch sessions are regularly used as a sourcing channels among venture capital investors. (Ramsinghani 2014; Klonowski 2007; Kaplan et al 2000)

Most venture capital companies are presented with hundreds or even thousands of investment opportunities a year, depending on the efficacy and robustness of their respective sourcing pipelines. The high volume of investment opportunities requires that venture capital companies have a fast and efficient screening process that selects the most viable ventures with lucrative risk-reward ratios. In order to achieve the returns expected by the limited partners, screening process has to be able to systematically separate high potential investment opportunities from subpar investment opportunities. The screening criteria used in the screening process generally varies between different venture capital investors, and in addition personal experience and views can have a significant effect on the outcome of the screening evaluation. However, factors such as market size, technology, business strategy, competition, management team and scalability of the business are used by most venture capital investors in their respective screening processes. For maximum efficiency, screening process is typically divided into multiple levels which gradually weed out the ventures that do not meet the required risk-reward ratio. For example, the initial screening level usually takes a few minutes and consist of reading an executive summary or some other short business presentation, whereas the final screening often happens in a meeting where the entrepreneur presents the business to the venture capital investor. (Marvin 2006; Kaplan et al 2000)

The second phase of venture capital investment process, called due diligence, begins when an investment opportunity successfully passes the screening process. Due diligence is a comprehensive fact gathering and reviewing process that aims to provide the investor with all the material information regarding an investment and a full understanding of all business operations, assets, liabilities and risks inherent in the investment opportunity. The overall goal of the process is to evaluate the potential return on investment and economic viability of the investment opportunity in order to make an informed investment decision. As with the screening process, a due diligence process is typically conducted in multiple stages that gradually become more granular as the process nears the final investment decision. The exact structure of the process differs between investors and their preferences, but some of the common aspects of due diligence include verifying management team's track records and backgrounds, performing market, product, customer and competitor analyses, conducting legal and IT due diligence and reviewing audited financial statements. (De Cleyn et al 2007; Kaplan et al 2000)

In the event that due diligence process is successfully completed and the decision to invest is made, the investment process moves to the third phase: negotiating the investment terms and closing the investment. The objective of the negotiations is to structure the investment transaction in a way that both parties find acceptable. The negotiated terms define the structure of the investment, which contains the framework that describes how the investment capital flows from the investor to the company and back. The design of the investment structure includes a large amount of different provisions and clauses that are governed by two key parameters: economics and control. From a venture capital company's perspective, economics of the investment structure define its options to invest more if a portfolio company performs favorably, whereas control structures provide the venture capital company with rights that minimize the risks in a downside scenario where the portfolio company has not performed as expected. If both parties of the investment transaction find the investment terms agreeable, legal documents are drafted, signed and the capital is wire transferred to the portfolio company. (Feld et al 2017; Ramsinghani 2014)

The majority of risks inherent in the investment period and investment process can be divided into two distinct categories: specific risk and agency risk. The risks in both of these categories are mostly driven by incomplete information and the future uncertainty of innumerable external factors. Specific risks are risks that affect a venture capital company indirectly through its portfolio companies. There are two sets of factors that cause the portfolio company specific risks: business risk factors and financial risk factors. Business risks include internal and external factors that have a possibility to adversely affect a portfolio company's business operations and cause losses to investors through lower valuation of the business. Internal factors relate to the management and operational efficiency of the business, whereas external factors include, for instance, market demand, technological development, existing and potential competition and other unforeseen occurrences caused by company's stakeholders. The other set of company specific risk factors consists of financial risks. These risks are connected to the capital structure of a company and its ability to meet its financial obligations. Weak capital structure increases a portfolio company's risk of inconsistent earnings and cash flows, illiquidity and bankruptcy, hence implicitly increasing the venture capital company's total specific risk. (Proksch et al. 2016; O. Fiet 1995)

Agency risk can be described as the degree of uncertainty that a portfolio company's founders will withhold relevant information from investors and pursue their own interests instead of complying with the terms of the investment agreement. It emerges when the interaction between founders and investors includes high amounts of investment uncertainty, behavioral incentive problems, information asymmetry and difficulty to monitor the actions and motivations of the founders. As a result, investors cannot be certain that founders are acting in investors' best interests instead of behaving opportunistically and diminishing the monetary value of investors' stake in the company. Agency risk consists of two different time-related aspects: adverse selection and moral hazard. The former arises from incomplete information provided by the founders to the investors before an investment has been made, whereas the latter is caused by founders not acting according to the investment agreement after an investment transaction has been completed. Adverse selection and moral hazard can result in unsuitable and excessively risky investments and founders' exploitative behavior, which have the potential to cause major investment losses for all investors, including venture capital companies. (Bellavitis et al 2017; O. Fiet 1995)

The amount and potential impact of portfolio company specific risks and agency risks emerging during the investment period are strongly correlated to a venture capital company's screening process, due diligence and terms of the investment. Moreover, sourcing process can also be perceived as a risk factor; insufficient flow of investment opportunities can be particularly a challenge for young venture capital companies without robust sourcing networks. Inadequate screening and due diligence processes lead to investments that hold unidentified and insufficiently evaluated risks, which can significantly affect the valuation of the investment on both short-term and long-term, and thus cause an increase in the risks of the investment process and period. Additionally, inaccurate screening process can result in unnecessary waste of time and resources if unsuitable investment opportunities are not screened out early enough in the process. When properly designed, the terms of the investment protect a venture capital company from specific risks and agency risks during the investment period, whilst poorly structured investment terms do not remove or reduce the impact of occurred specific risks or agency risks, therefore increasing the risks inherent in the process of making investments. Wrong or inadequate provisions and clauses can prevent a venture capital company from exiting or reducing its position in underperforming portfolio companies, or lead to a situation where a venture capital investor is not able prohibit an

entrepreneur from taking an action that is unfavorable to the investor. (Proksch et al. 2016; O. Fiet 1995)

Another important factor of the investment process is the stage of the investment. The risks associated with a venture capital company's investing process are usually strongly related to the level of development of the venture. Early-stage companies, which are firms that have not yet developed a viable product or service, are more uncertain and carry higher risks compared to second-stage or late-stage companies, which are firms that already have operational business models and generate revenue. As a company progresses through these different stages, agency risks and specific risks surrounding the company start to diminish in most instances. However, even though investments in early-stage companies typically carry more risk than investments in later stage companies, the required amount of capital invested in these ventures is often considerably lower compared to later stage ventures. Smaller investment amounts mean less exposure to the risks of individual investments and enable more comprehensive portfolio diversification, thus leading to a lower amount of total risk exposure associated with investments in early-stage companies. Correspondingly, late-stage companies bear less agency and specific risks, but require larger investments, hence increasing the potential impact of a realized investment risk. (Ramsinghani 2014; Elango B. et al 1995)

2.1.3 Risks associated with managing investment portfolio

When a venture capital fund's investment period is over and its portfolio is fully constructed, the fund can no longer make investments in new companies, but it can invest its reserved capital in existing portfolio companies. This third operation phase of a venture capital fund, called the investment term, commences after the capital raised from limited partners has been invested and allocated. It generally lasts from five to seven years, depending on the willingness of the limited partners to keep the fund operating. The amount of available investment capital during the investment term depends on how much investment capital has been allocated to future funding rounds for each company in venture capital fund's portfolio at the time when the initial investments are made. During this portfolio management period a venture capital company makes follow-on investments from the funds that the venture capital fund has reserved, closely monitors the fund's

performance and generated returns and actively supports its portfolio companies to grow their respective businesses. (Feld et al 2017)

Monitoring and supporting portfolio companies are the two most important activities for a venture capital company during a fund's investment term. The broadness of these activities means that they overlap with each other, and in many cases represent complementary roles. The focus on monitoring relates to a venture capital company's need to prevent and correct any potentially harmful activities that portfolio companies' entrepreneurs might do, regardless if they are intentional or unintentional. Considering the information opaqueness encompassing early-stage ventures and the strong emphasis on intangible assets in most venture capital investments, close monitoring conducted by the venture capital company is important in order to understand the behavior and actions of the entrepreneur. Supporting, on the other hand, focuses on value adding activities that attempt to increase the upside potential of portfolio companies. Venture capital companies' general partners often have technological, financial, industry, and managerial experience, leadership skills and networks which might be central for the success of the venture and reduce the risk of failure. (Proksch et al. 2016; De Clercq & Manigart 2007) Several studies have proven that venture capital companies are able to add meaningful value to portfolio companies by providing them with different types of value added services like strategy, governance, financials, operational improvements and human capital improvements (Tang et al. 2014; Guo & Jiang 2013; Cumming et al. 2005; Bottazzi et al. 2002).

Venture capital companies normally monitor and add value to their portfolio companies through informal and formal channels. Communication through informal channels includes interim financial reports, periodical checkups on the progress of the business in physical meetings or over the phone and quarterly portfolio reviews. Formal monitoring and value-adding are performed by a venture capital company's general partner or manager taking a seat on the board of directors of their portfolio company. The board of directors is a formal governance mechanism that oversees all activities and has the ultimate decision-making authority, therefore making it the most important tool for venture capital companies for monitoring, controlling and supporting their portfolio companies. Choosing the right person to serve on the board is important for venture capital companies due to board members being bound by strict fiduciary duties, which require directors to

act in the best interests of the corporation and with the care that an ordinary prudent person in a similar position would exercise under comparable circumstances. (Ramsinghani 2014; De Clercq & Manigart 2007)

The primary role of a board member, including venture capital board members, is to create and sustain value, select and assess chief executive officer and manage risks through building a business strategy which is supported by effective management, financial planning, market analysis and legal compliance. While serving on the board of a portfolio company, venture capital board member's legal duty is to the common stockholders in the long term, not to the holders of preferred stock. However, board members appointed by venture capital companies also have a fiduciary duty to the venture capital fund and its limited partners, which can, in certain situations, cause a conflict of interest and create litigation risk, if the board member places the venture capital fund's interests ahead of the portfolio company's common stockholders' interests. In the case of a breach of duty, in addition to the personal liability of a venture capital company-nominated director, the venture capital company is at risk of being drawn into a litigation if the prosecution has evidence that shows that the venture capital has somehow aided or facilitated the breach of duty. (Davis & Guye 2018; Ramsinghani 2014; De Clercq & Manigart 2007)

As with the investment process, portfolio management phase is likewise subject to risks related to information asymmetry between the venture capital investor and the entrepreneur. These risks stem from factors such as differing goals between the two parties, changes in entrepreneur's behavior after receiving an investment and unequal distribution of essential information. The risk of incongruous goals relates to situations where the entrepreneur, for example, focuses on generating personal income or attempts to keep the company operational even if it is not beneficial for the investors. Equally, the venture capital investor might be aiming for an early exit by selling the company to a corporate buyer or private equity investor, whereas the entrepreneur may have ambitions to continue building the company and stay independent. If the aforementioned contradictory goals are not controlled and aligned properly, they are likely to have negative effects on the company's operations and decision-making process, ultimately affecting the valuation of the portfolio company and its upside potential. (De Clercq & Manigart 2007)

Behavioral alterations that occur following an executed financing deal are another sub-category of asymmetric information risks that venture capital funds often encounter during the portfolio management phase. These post-investment agency issues are typically defined with the term 'moral hazard', which pertains to a party's potential neglecting behavior and unwillingness to make efforts that are sufficient enough considering circumstances, even in a situation where it has the capability to meet pre-set expectations (Eisenhardt, 1989). Moral hazard is a result of a situation where the entrepreneur, as an insider of the company in addition to being the controlling officer, has access to information about the company that is not available to the venture capital investor. Once having received the investment, the entrepreneur may use this information asymmetry to change her behavior in order to misinform and mislead the investor. For example, the entrepreneur might try to hide the actual progress and status of the business, or act in a way that prioritizes her own wealth over the company's well-being. This kind of behavior can be highly detrimental to a venture capital fund's portfolio company, therefore making it necessary for venture capital companies to supervise and monitor portfolio entrepreneurs' activities. (De Clercq & Manigart 2007; Cable & Shane 1997)

Another group of portfolio management related risks arises from the combined performance of a venture capital fund's investments. Each individual fund has its own financial objectives, typically related to generating a high-enough return on investment for the limited partners. A venture capital fund's total investment return to limited partners is calculated by combining the returns received from selling the fund's ownership stakes in its portfolio companies. The total return generated is always uncertain to some extent, which means that every venture capital fund has a chance that the combined returns from portfolio companies are not high enough to meet the financial objectives of the fund. This uncertainty in portfolio performance can be defined as portfolio risk. The amount of portfolio risk is directly connected to the financial assets in the portfolio, and thus it is possible to adjust the amount of risk in any given investment portfolio through asset allocation and investment time frame. By using proper asset allocation and investment time frame management, investors are able to set the portfolio risk to match their respective risk tolerances. (Proksch et al. 2016; http://www.tuck.dartmouth.edu 2003)

In the context of venture capital investing, designing and constructing an investment portfolio factors in the size and timing of investments with the perspective to balancing cash flows and

optimizing the chosen risk-reward ratio. The primary factors that affect a venture capital fund's portfolio risk include investment timing, investment stage, investment sector, geography of the investments, number of investments and investment amount at the point of entry. For venture capital companies, timing of investments is a risk factor that refers to the time diversification of investments throughout the venture capital fund's investment period. Lack of time diversity in investments exposes a venture capital fund's portfolio to risks deriving from macroeconomic and industry specific cycles and transitions, such as bubbles, financial crises and systemic risks. A venture capital fund's targeted stage of investment describes at which stage of a company's development cycle the fund is financing. Funds that focus only on one specific funding stage carry increased portfolio risk due to the similar risk-profiles between companies that are in the same development stage. (Feld et al 2017; Proksch et al. 2016; http://www.tuck.dartmouth.edu 2003)

Sector allocation strategy is another significant risk factor in a venture capital portfolio; limiting a fund's investing to a specific industry has the potential to either increase or reduce the overall portfolio risk, largely depending on the industry expertise and experience of the venture capital company's general partners and investment managers. Venture capital companies with special industry-related expertise, skills and knowledge are able to affect both sides of the risk-reward ratio for their portfolio investments. They are able manage company-specific risks by possessing and exploiting particular information about a specific sector or industry, giving them a competitive advantage over other non-specialized venture capital companies. Furthermore, by taking advantage of the industry-specific networks that they have built, specialized venture capital companies are able to grow their returns to increase the likelihood and value of a successful exit. However, specializing in particular industries exposes a fund's portfolio to industry specific risks which can outweigh the benefits gained from the specialization. These industry risks arise from factors such as overall industry growth prospects, new competing technologies, regulatory changes and industry cyclicality. (Bartkus & Hassan 2009; Wüstenhagen & Teppo 2004)

A venture capital fund's geographical allocation of investments also influences the total amount of risk its portfolio carries. A geographically concentrated portfolio is more vulnerable to country risks, which include political risk, exchange-rate risk and economic risk. In addition to concentration risk, geographical distance between a venture capital company's fund and its

portfolio companies can have an impact on the fund's agency risk. The flow of information among the portfolio company and the venture capital company is reduced and slowed down by a long physical distance; this hinders the venture capital company's ability to monitor and support the business, thus potentially increasing agency risk and missing some of the possible upside that a closer working relationship could have created. (Chen at al 2010; Mason 2007)

As well as the aforementioned concentration risks of time, sector and geography, the number of investments in a portfolio is a significant factor of the total portfolio risk. A small number of investments in a portfolio creates a large risk exposure to individual portfolio companies and lowers the probability of finding highly successful ventures that can generate returns that exceed the original investment by several multiples. However, correspondingly, a large amount of investments limits the venture capital company's capability to actively monitor and support all of its portfolio companies. According to a study conducted on 214 venture capital funds, the average amount of investments in a venture capital portfolio is approximately 20 companies. (Cummings 2006)

2.1.4 Risks associated with investment exits

The final stage of a venture capital company's operational cycle is a process that includes liquidating the fund's remaining investments, calculating the fund's total return on investment and returning the remaining capital, deducted by the venture capital company's cut, to the fund's limited partners and finally dissolving the fund. The liquidation stage of a venture capital fund commences when the fund's investment term comes to an end, typically after ten to twelve years from the fund's initial call of capital. Unless the fund's limited partners agree to extend the term of the fund, the venture capital company is forced to liquidate all the remaining investments in the fund's portfolio. Bhattacharya and Ince (2015) found in their study that the finite lifespan of venture capital funds causes exit pressure as the funds get closer to expiration; according to the study, businesses backed by venture capital funds that are nearing the end of their lifespan are exited more quickly, suggesting that the finite lifespan of venture capital funds is driving venture capital companies to exert substantial pressure on fund portfolio companies' management teams to pursue a company sale. (Feld et al 2017; Schwienbacher 2009)

The two primary investment liquidation options for venture capital companies, often called investment exits, are acquisition and initial public offering. Liquidation through acquisition occurs when a portfolio company, or majority of its ownership, is sold to another company. When the transaction is completed the portfolio company ceases to exist in a legal meaning and becomes part of the acquirer's organization. The other main option for liquidating an ownership stake in a portfolio company is to conduct an initial public offering. Through this process a privately-held portfolio company initiates a public offering in which shares of the company are sold on a public stock exchange to institutional and retail investors. After the initial public offering has been completed, shares of the portfolio company are freely traded on the open market and the previously privately-held company has transformed into a public company. (Feld et al 2017; Ramsinghani 2014; Schwienbacher 2009)

In addition to the options of selling or taking a portfolio company public, other alternative liquidation methods for a venture capital company include selling the shares owned by its fund on secondary markets, entrepreneur buying back the shares from the fund, venture capital company forcing the portfolio company to repurchase the shares by exercising redemption rights and the portfolio company filing for bankruptcy in order for the venture capital fund to write off the investment. These alternative liquidation strategies are rarely used by venture capital companies to monetize a profitable investment; rather, they are used to dispose of unsuccessful investments. (Feld et al 2017; Ramsinghani 2014; Schwienbacher 2009)

When a venture capital company has managed to liquidate all of its investments in a fund, it calculates the total return of the fund in order to determine its own share of the profits. Provided that the fund has was able to generate positive total return, the venture capital company typically receives 20% share of the profits, known as the carried interest. If a venture capital company has received a share of the profits early in the life of a fund, it faces a risk of clawback in the event that subsequent investments generate negative returns. A clawback provision written in a limited partnership agreement ensures that limited partners receive their agreed-upon share of a fund's total return, but simultaneously creates a significant risk for the venture capital company due to the impossibility of predicting what the overall fund return will be at the end of the fund's investment term. The risk of overdistribution of profits is most likely to occur if the early successful

investments of a venture capital fund are later followed by unsuccessful investments that offset the previously made profits. As a result of overdistribution, the limited partners have the right to demand the shortfall amount from the fund managers at the final liquidation of the fund. (Feld et al 2017; Landström & Mason 2012)

In addition to clawback risk, the liquidation process of venture capital portfolio investments inherently involves several significant risks that are related to agency issues, market conditions, timing of liquidation and method of liquidation. As with agency risk during the investment period and investment term, differing objectives between a venture capital investor and an entrepreneur regarding the timing and method of liquidation can lead to an agency conflict between the two parties. Because of limited fund lifespan, venture capital companies are not long-term investors and thus, in general, have a different time horizon and business perspective for their investments than company founders. These agency conflicts are likely to create additional barriers that may hinder or prevent optimal exit for the venture capital company. Moreover, a disagreement between the venture capital company and the entrepreneur about liquidation can have a negative effect on the portfolio company's operations and decision-making process which can further complicate the liquidation process. (Schwienbacher 2009)

The condition of financial markets and the timing of the liquidation are a critical part of a venture capital company's liquidation process, and can pose a significant risk to its successful completion. Premature efforts to push for liquidation can lead to weak buyer interest and a low company valuation, whereas starting the liquidation process too late raises the risk of an unfavorable shift in market dynamics that impairs the portfolio company's valuation. For instance, delayed liquidation may cause the potential buyers or investors to lose their interest due to new competitors or competing solutions entering the market. Furthermore, liquidating investments during adverse market conditions creates an increased risk of either an unsuccessful liquidation process or non-optimal valuation. The method of liquidation also affects the risks associated with liquidation timing; liquidation through an initial public offering or acquisition are both affected by market conditions, but, in general, initial public offerings are more sensitive to changes in market conditions. (Gillain 2016; Ramsinghani 2014; Schwienbacher 2009)

Besides market conditions, the method of liquidation has an integral part in many of the risks involved in the liquidation process. The two most common ways of liquidation for venture capital-funded companies, an acquisition or initial public offering, both have a distinct set of risks that can significantly influence the likelihood of a successful liquidation of a portfolio investment. The key difference between the two methods is that acquisitions offer a faster, less expensive and lightly regulated liquidation process, whereas initial public offerings require a lengthy and expensive offering process and favorable market conditions for a successful investment liquidation. However, if a portfolio company is mature enough, has the required resources and the financial markets are in a suitable condition, a liquidation through an initial public offering is likely to generate higher returns compared to an acquisition. (Gillain 2016; Ramsinghani 2014)

Acquisitions are the preferred method of liquidation for most venture capital companies due to their speed and efficiency, but at the same time they involve several notable risks that may lead to an unsuccessful liquidation process or non-optimal valuation. These risks include hiring an ineffective investment banker to oversee the liquidation process, parties that pretend to be potential buyers but in reality are only seeking information or trying to slow down the sale process and signing a letter of intent that has inadequate protective terms for the portfolio company. Additionally, the letter of intent contains several other terms, including representations and warranties, earn-outs and escrows, form of consideration and indemnities offered by the seller, which may have a considerable impact on the liquidation process and its risks. Representations and warranties are the facts and assurances about the portfolio company's business that the seller gives to the acquirer; if these terms are breached, either the company being acquired or its shareholders, depending on the terms, are required to pay a pre-agreed indemnity to the acquirer. Earn-outs are contractual provisions that require the portfolio company to achieve predetermined performance targets after the completion of an acquisition in order to receive the full purchase price. In the event that the targets are not reached, the acquirer will keep the earn-out sum, which directly affects the total return a venture capital fund and other shareholders receive from the sale. (Feld et al 2017; Gillain 2016; Ramsinghani 2014)

An escrow provision defines a certain percentage or amount of the purchase price that is held by a third party for a pre-agreed period on behalf of the transacting parties to satisfy any issue that might

arise post acquisition that has not been disclosed in the purchase agreement. An escrow provision will decrease a portfolio company's purchase price should any claim be brought under it, therefore the size and other terms of the escrow are an important risk factor for the seller. The form of consideration determines in what form the purchase price is paid; in most cases it can be either cash, acquirer's stock or a combination of the two. Cash payment is typically the preferred option for the seller due to its liquidity and relatively low volatility, whereas stock consideration can be highly illiquid and volatile, largely depending on the size of the acquirer and if it is a publicly- or privately-held company. All-cash transactions are particularly important for venture capital companies due the limited life span of venture capital funds and the fact that fund returns are calculated by using the internal rate of return. (Feld et al 2017)

The initial public offering is generally regarded as the most successful and most profitable liquidation method for shareholders and entrepreneurs alike. If a portfolio company meets all the listing requirements, has a successful business and the stock market is favorable, an initial public offering, out of all the liquidation methods, has the potential to generate the highest returns. (Bascha & Walz 2001) However, similar to the acquisition, the initial public offering carries several risks regarding the liquidation process. Market conditions and their sudden changes are one of the primary risk factors for unsuccessful or low-priced initial public offerings. The volatile nature of the stock market and the expensive, complex and time-consuming preparations for the initial public offering may lead to a situation where business and market conditions change radically before the initial public offering process is completed. If the change is adverse, the offering may have to be completely cancelled or the issue price has to be lowered in order to prevent an undersubscribed offering. (Feld et al 2017; Gillain 2016)

A lock-up period is another significant risk factor for venture capital companies and other investors who have made their investment before the initial public offering. Most initial public offerings include a lock-up provision, which is a caveat placed on insiders and pre-initial public offering investors that prevents them from selling their shares for a predetermined period of time after the portfolio company has gone public, typically lasting four to six months. As a result, the owners of the stock subject to the lock-up period are exposed to changes in business and market conditions

and to the risk of decline in share price, which, if occurred, results in a reduced internal rate of return for the pre-initial public offering investors. (Feld et al 2017; Gillain 2016)

2.2 Risk management techniques in venture capital financing

Venture capital investing is characterized by the extreme volatility in the outcomes of investments and in the returns of venture capital funds. By making investments only in startup businesses, venture capital companies are taking enormous amounts of risk without any certainty of future returns. As a result of the severe investment risks and volatility of fund returns, extensive management of risks is one of the main activities of venture capital companies. Various different risk management techniques are employed by venture capital companies in order to identify, evaluate, control and monitor the various risk involved in individual investments, as well as portfolio- and company-wide risks. Of all the risk management techniques, diversification of investments is the most crucial part of venture capital risk management; a well-diversified venture capital portfolio not only reduces company specific risks and concentration risks, but in addition, the large amount of portfolio companies increases the likelihood of making an investment in a company that becomes extremely successful and generates extraordinarily high returns. Other frequently used venture capital risk management techniques include pre-screening and due diligence, financial contracting, syndication, staged financing, management and board selection, monitoring and industry specialization. (Proksch et al. 2016; Kut et al. 2007; O. Fiet 1995)

2.2.1 Portfolio diversification

Due to the fact that approximately seventy percent of startups fail in the first ten years of operation, a venture capital portfolio has to be built differently compared to other investment portfolios, such as public equity portfolios or fixed income portfolios (www.bls.gov 2016). High failure risk of individual investments drives venture capital companies to diversify their funds' portfolios in order to reduce portfolio company-related risks, as well as industry and stage-related risks. The benefits of portfolio diversification in venture capital investing have been confirmed in several studies which have documented a positive relationship between venture capital fund diversification and

performance (Humphery-Jenner, 2012; Knill, 2009; Lossen, 2009). In addition, Buchner et al (2017) conducted a study that showed that greater diversification reduces fund risk, making possible for risk-averse managers to select riskier investments, and thus, investments with higher expected returns. However, the scope of diversification is restricted in terms of number of investments due venture capital companies' limited resources to actively monitor and support all their portfolio companies. The trade-off between portfolio size and effectively assisting portfolio companies to grow their businesses is a complex risk factor that depends largely on each respective venture capital company's value-adding capabilities. (Buchner et al 2017; Cressy et al 2012)

Portfolio diversification does not only refer to increasing the amount of individual investments in a portfolio, but it can also be implemented through industry, stage and geographical diversification. Diversifying portfolio investments across multiple industries reduces industry-specific risk, whereas diversification through stage of development reduces the portfolio's exposure to risks that are specific to different investment stages such as seed-, early-, growth- and late-stage. Geographical diversification, in turn, means spreading portfolio investments across different geographic regions in order to reduce country-specific risks and source new investments. Broadening portfolio diversification along at least one of these dimensions faces the same trade-off as diversification through growing the number of portfolio companies; if fund managers have to monitor existing investments and focus on making investments in multiple investment stages, industries and geographical areas, it is possible that the benefits gained through the reduced portfolio concentration risk are partially or completely offset by the negative effects of the over-diversification. (Buchner et al 2017; Cressy et al 2012)

2.2.2 Due diligence process

Due diligence is a series of processes and activities that are combined together in order to evaluate an investment proposal by detecting and analyzing its most important risks and potential upside. An effective due diligence process increases a venture capital company's probability of identifying successful investments and avoiding investments that are not able to generate high enough returns. The process is designed to reduce the investor's risk by understanding the possible issues and challenges embedded in a potential investment. Furthermore, a formal due diligence process

enables a venture capital company to review higher volumes of investment opportunities and accelerates deal execution. A formal and clearly defined due diligence process is established by creating a company-wide due diligence strategy that determines the criteria for screening and evaluating potential investments. This strategy is based on the investment philosophy and criteria of the venture capital company and it defines how the process is structured to address specific risk factors. (Ramsinghani 2014; De Cleyn et al 2007; http://www.tuck.dartmouth.edu 2003)

The due diligence process can be broken down into two distinct phases, an initial screening of the deal and a more detailed evaluation that aims to determine the suitability of a deal before moving to the next phase in which the valuation and deal structure is negotiated. The intent of screening phase is to quickly identify the deals that either do not fit with the investment criteria of the company or do not possess the qualities that are considered necessary for success. Each venture capital company sets its own screening criteria to match its investment and due diligence strategies, although there are a few characteristics that are commonly used as a screening criteria for venture capital investments. These typical screening criteria include investment stage and size, industry sector, geographic location, product, market and management. In the event that an investment proposal passes the screening phase, it moves to the due diligence phase, where the potential of the deal is verified through a deeper analysis. Often the due diligence criteria which are evaluated are similar to those used in the screening criteria but in greater depth. This means that the assumptions made during the screening phase need to be further investigated and verified during the due diligence phase. As a result, most often the main purpose of due diligence is to test the robustness and reliability of the information obtained during the screening process. (De Cleyn et al 2007; http://www.tuck.dartmouth.edu 2003)

2.2.3 Financial contracting

Designing specialized financial contracts is a central part venture capital risk management. Due to the severe information asymmetries and agency problems of early-stage growth companies, financial contracting has a key role in the investment decision-making process. Optimal contracting alleviates agency-related risks, provides transparency and ensures that the incentives of the entrepreneur and the venture capital investor are aligned. In addition, contracts can be used in order

to ensure compliance with previously defined control mechanisms, responsibilities, tasks and outcomes. Most of the financial contracts that venture capital companies use are some form of convertible preferred equity. Venture capital investors demand these preferred shares in order to reduce risks, create downside protection, maximize investment returns and gain advantages in a variety of situations. (Burchardt et al. 2016; Bratton 2002)

Venture capital contracting, in general, has two main factors that govern all contracting: economics and control. The term economics refers to the return that an investor receives in a liquidity event, such as an acquisition or initial public offering, and the contractual terms that directly impact this return. (Feld et al 2017) Well-structured economics terms allow a venture capital investor to make follow-on investments and increase its ownership of a venture that is progressing favorably, or, in the opposite situation, minimize the risks and potential downside in order to recoup as much as possible of the original investment. The terms that make up the economics of an investment agreement include valuation, liquidation preference provisions, right of first refusal, redemption rights, pay-to-play provisions, vesting of options and stock, employee option pool and anti-dilution provisions. From risk management perspective, particularly valuation, liquidation preference provisions and anti-dilution provisions are able to provide a significant downside protection if negotiated so that they favor the investor. (Burchardt et al. 2016; Ramsinghani 2014)

The second main factor of venture capital contracting, control, refers to the mechanisms that allow an investor to either exercise control over the portfolio company or to veto a specific business decision. Venture capital companies typically hold minority interest positions in their portfolio companies, but through proper control terms they effectively gain control of many activities of their portfolio companies. The most essential control terms comprise board of directors, protective provisions, drag-along rights and conversion of shares. These contractual rights minimize a venture capital company's investment risks, protect against downside and aim to amplify the potential upside of a portfolio company. (Feld et al 2017)

2.2.4 Syndication

Syndication is another method that venture capital companies use to diversify their portfolios and reduce risks related to individual investments. In venture capital investing, syndication refers to an investment strategy where multiple venture capital companies, or other investors such as angel and corporate investors, share an investment opportunity by joining together and forming an investment syndicate. Most venture capital syndicates have a lead investor, who usually negotiates the investment terms for the entire syndicate (Feld et al 2017). Co-operation via syndication is a frequent feature of the venture capital industry. Of the approximately 30,000 companies that received venture capital funding between 1980 and 2005, about 70% received investments from two or more venture capital investors. (Tian 2011)

Syndicating investments provides a venture capital company with several advantages that reduce its portfolio company specific risks and increase the likelihood of finding and funding successful ventures. First, syndication enables a means of sharing risk on a deal-by-deal basis, which can reduce overall portfolio risk due to a more diversified investment portfolio. The scope for both syndicating out deals to other investors as well as syndicating into deals sourced by other investors also gives the venture capital company access to a wider amount of diverse investments. Second, syndication helps identifying, evaluating and confirming investment risks through participation of other investors. Different investors typically have varying perspectives and opinions, which can help reduce adverse selection risks because investment opportunities and potential follow-on investments are reviewed by multiple independent observers in the syndicate. In effect, independent venture capital companies or other investors in the syndicate might screen investments more effectively than just a single venture capital company, because each investor learns something from the evaluations made by other partners in the syndicate. Moreover, having multiple syndication partners often increases the depth of the due diligence process, and thus improves the investment decision process, reduces investment risk and increases the chances of success. (Antweiler et al 2002; Manigart et al 2002; Lockett & Wright 2001)

The third advantage of venture capital syndication concerns the assistance and guidance of portfolio companies. A syndicate formed by venture capital companies that have differing skills, information, networks and industry expertise can provide a startup company with a broad range of important financial and business inputs. Some venture capital companies may be more capable in

screening investments and thus are able to invest larger sums in riskier and more R&D intensive companies that take a long time to achieve profitability, whereas other venture companies may have more extensive networks to assist startup companies to recruit new key employees, develop customer relations and find suppliers. Furthermore, some venture capital companies can bring additional value to the syndicate by providing abundant financial resources and a degree of security for startup companies. Finally, venture capital companies that are fully owned by corporations may possess superior knowledge, expertise and relationships in certain industries in which the corporate venture capital company's parent company operates. (Tian 2011; Antweiler et al 2002)

2.2.5 Staged financing

One of the key characteristics in venture capital investing is staging the commitment of capital and retaining the possibility to abandon a venture in case it does not perform or grow according to expectations. Staged financing is widely used in seed- and early-stage investments to control risks and mitigate issues caused by moral hazard. When using staged financing, instead of providing a large amount of capital upfront, a venture capital company invests in stages in order to keep the portfolio company portfolio under control. Typically before any subsequent funding takes place after the initial investment stage, the portfolio company has to meet goals defined by its investors. As a result of these predetermined milestones, staged investments technique allows a venture capital company to monitor its portfolio companies' performance before it decides to make follow-on investments. This information acquired through monitoring helps the venture capital company to avoid making large upfront investments in unsuccessful ventures, and thus reduces its total investment risk. Additionally, staged financing has the potential to significantly diminish agency risks related to investing, since it enables effective monitoring and develops a multi-period financial relationship which can be terminated at the venture capital company's discretion. (Giat 2005; Wang & Zhou 2004) According to Sahlman (1990), moral hazard related issues, such as entrepreneurs using invested capital enrich themselves, shirking job responsibilities or continuing a project that has negative expected profits, are best controlled through the use of staged financing.

The implementation of staged financing can be accomplished by setting specific milestones or by using various forms of equity, convertible securities and debt. For instance, when staged financing

is done through a convertible note, the investment is initially made in the form of debt, but the venture capital investor has a right to convert the loan into shares at any time. The main idea behind using convertible notes and other hybrid securities is that the venture capital company has the option to halt making further investments at any time after the initial investment. (Wang & Wang 2009) When staged financing is implemented as a milestone progression, multiple different goals can be used to measure a venture is performing. For example, completion of a prototype, signing a major partnership, reaching a certain user amount or validation from an important customer are a few milestones that are normally used to structure staged financing. As a portfolio company builds its business and reaches various milestones, it usually requires ever-increasing investment rounds to scale its organization, increase capital expenditures, accelerate sales and conduct product development. However, at the same time the cost of capital to the venture capital company decreases as the rounds grow, due to lower risks associated with more accurate forecasts of future revenues and earnings. If a venture capital company, which participated in the initial financing round, is not able or willing to participate in the subsequent larger financing round on a pro rata basis, the venture capital company will lose some or all of their preferential rights in case the investment agreement had a pay-to-play provision. (Giat 2005; Plummer 1987)

2.2.6 Selection of the board and management

The board of directors wields the greatest influence over a portfolio company's future direction, which includes oversight of identification, evaluation, mitigation and monitoring all critical risks. Hence, securing a board seat at a portfolio company is gives a venture capital company direct influence over corporate decisions. Additionally, venture capital investors serving on portfolio company boards, either as directors or observers, receive proprietary and material information about the company's business. The primary role of a board member comprises: (a) create, sustain and enhance shareholder value, (b) evaluate CEO's performance and future vision for the company, assist in recruitment and succession planning, (c) manage risks through business strategy, market insights, finance and legal compliance. (Ramsinghani 2014) A competent board of directors helps a portfolio company to successfully attract customers, build effective distribution channels, achieve strong cash flow and seize a solid competitive position from early on. Furthermore, a competent board ensures that adequate risk mitigation is integrated into all the aforementioned operations.

3 METHODOLOGY

This chapter of the study explains the chosen methodological approach and the reasons why it was chosen based on the aim of the study. Additionally, the chapter highlights certain methodological limitations that are present in the research. The main objective of the study was to understand what kind of risks are included in the operations of a venture capital company and what tools and methods venture capital companies are using to control and mitigate these risks. Literature review revealed that most venture capital risk management studies mostly focus on individual risks or risk management methods, whereas research conducted on the overall company-wide risk management of a venture capital company has been relatively scarce. Furthermore, majority of the existing studies are conducted by using a quantitative research method. This study seeks to contribute to this less researched area by utilizing a qualitative research method and an interpretive research model. In addition, justification for the choice of using qualitative method in this research also stems from the fact that the chosen approach allowed the researcher to explore the topics and themes relevant to the study more in-depth compared to what would have been possible with quantitative research methods. In order to achieve the goals of the study, research was conducted using semi-structured interviews which enabled examination of the topics of the study from various points of view.

3.1 Research instrument design

The interview questionnaire used in the interviews serves as the primary research instrument in this study. In this study, the questions in the interview questionnaire pursued to investigate the risks faced by venture capital companies and what measures venture capital companies take to manage these risks. In order to create an independent interview questionnaire, the questions were based on common risks and risk management methods found both in studies concerning venture capital investing and literature about venture capital risk management. Furthermore, a question about risk

management strategy was also included to the interview questionnaire in order to find out how systematically interviewees organized their risk management standards and operations. The interview questions were designed to be semi-structured and open-ended so that it would be possible to gain in-depth information about the topics of the interview and to have the option to further explore any of the topics.

3.2 Sample and participants

The sample size on this study was four. The size of the sample is moderately small, but due to the qualitative approach of the study and resource constraints, it was deemed appropriate. The participants of this study were partners and employees in venture capital companies and other investment companies that had at least one active venture capital fund under their management. Additionally, all of the participants had one or more offices in Finland. All of the participants were selected so that the sample would be as representative as possible and provide rich information about the risk management related matters that are of central importance to the purpose of the study.

3.3 Data collection

Venture capital companies and other investment companies that had at least one active venture capital fund were initially contacted via email to introduce the study to them and to ask if they would be interested in participating in the research. The email provided an introduction to the thesis project, and explained what the interview included and how the interview process was structured. In addition, the main questions of the interview and an unfinished version of the theory section of the study were attached to the email in order to give the respondents a better understanding of the study's objectives and content. If a respondent agreed to participate, a date and time for the interview were set.

The interviews were conducted over the phone in Finnish. The main reason for conducting the interviews over the phone was to save resources, such as time and money, and to offer the interviewees a convenient way to participate in the study. A voice recording software was used

during the interviews with the consent of participants in order to ensure that all the information revealed during the interviews was recorded for the purpose of subsequent data analysis. The confidentiality of both the whole study and the interview recording was assured before the actual interview was started. A total of four interviews, all of which lasted approximately an hour, were conducted during the course of the study. After the interviews were completed, the audio records of the interviews were transcribed into Microsoft Word documents. Any real names, company details or personal details were removed from the finished transcripts.

3.4 Data analysis

Data analysis of the interviews was conducted by carefully examining the transcribed interviews on the basis of principles derived from thematic analysis. The approach of the analysis was interpretative in order to explore the interview data in a manner that would yield relevant in-depth insights about the subject matter of venture capital risk management. According to the principles of thematic analysis, the large amount of data from the interviews was grouped and transformed into manageable coded categories by identifying recurring risk management themes and issues that presented similar patterns. The focus of the data categorization was on organizing and coding the data into categories based on key risks and risk management methods, as well as establishing new conceptual elements and developments associated with venture capital risk management.

3.5 Reliability, validity and limitations of the study

The research process followed an interview questionnaire and a standardized interview procedure to ensure internal validity and reliability of the study. The questions used in the interview questionnaire were created based on previous studies and academic literature in order to increase the reliability and validity of the study. However, external validity of the study is limited due to the nature of the study, as qualitative research method does not typically seek to generalize its findings, but instead stays close to the empirical world and creates studies of the real world. Furthermore, it is not possible to achieve perfect reliability when a study focuses on real life situations.

Additional to the general approach of qualitative methodology, this research project also contains three other relevant methodological limitations. First, despite of the both standardized interview questionnaire and procedure, researcher's interviewing skills may have had an impact on the quality of the gathered data when conducting the interviews. Second, the small sample of venture capital investors is unlikely to represent the entire population of venture capital investors in a global or Finnish extent. Third, the analysis and interpretation of data are strongly dependent on the knowledge, skills and experience of the researcher.

4 INTERVIEW ANALYSIS AND RESULTS

This chapter presents the findings and results of the interviews that were conducted in order to study how venture capital companies view risks and how they incorporate risk management processes in their operations. As previously stated, thematic analysis was used to analyze the data, and thus the findings are categorized based on the interview questionnaire's structure, which was created to reflect the categorization presented in the theory section of this study. The chapter is comprised of two main categories: (a) risks associated with venture capital investing and (b) risk management methods associated with venture capital investing. These two main categories are broken down into same subcategories, excluding the formal risk management strategy subchapter, as in the theory section, enabling accurate comparison between the data collected from the interviews and the data compiled from previous studies and academic literature.

The analysis of the collected data is based on the interviews with the selected venture capital investors and exclusively studies their responses to the questions presented about risks and risk management methods. The analysis also identifies other trends and issues that are strongly connected to different aspects of venture capital risk management. The total amount of data collected during the interviews was relatively large, which resulted in a situation where not all of the collected data was relevant. Thus, the focus of the analysis was on data that was relevant in answering the main research question and related sub-questions of the study.

4.1 The use of formal risk management strategy in venture capital investing

The first question presented to the interview respondents was aimed to map out if their companies have a formal risk management strategy that encompasses and governs all of their operations. Due to a very scarce amount of information available regarding the use of a formal upper-level risk management strategy in venture capital companies, this question does not have a corresponding subsection in the theory section. However, similarly as with minimal literature about formal risk management strategy in venture capital companies, the interviews found out that none of the companies represented by the interview respondents had comprehensive and governing formal risk management strategies in place. Instead, all of the respondents had one or multiple risk management strategies, frameworks or mechanisms that they were actively using to identify, evaluate, control and monitor risks in their investment operations. Some of the interviewed companies organized their risk management operations on a fund level according to each fund's rules, whereas others used either single or multiple company level principles that were the basis of all of their investment risk management activities.

Most of the respondents had a standardized risk management framework that they were using to evaluate an individual investment's risks and potential. In most cases this framework mostly consisted of a static checklist which had the same inspection points for all potential investments. Several respondents explained that these static lists had been compiled through years of experience, and that they do not alter them between different types of startup companies in order to ensure consistency in their screening processes. Moreover, standardized checklists were used by all of the respondents to quickly and cost-effectively process and screen the large amounts of investments proposals that they were receiving from startup companies who were looking for funding.

4.2 Risks associated with venture capital investing

This section of the chapter presents the findings and results of the risk portion of the conducted interviews. The risk portion consisted of the four following operational phases of a venture capital fund: (a) raising a fund, (b) investing the fund's capital, (c) managing the fund's portfolio and making follow-on investments and (d) exiting investments and dissolving the fund. Additionally,

the interviewees were also asked if they were aware of other venture capital investing related risks that were not necessarily directly connected to any of the traditional phases of a venture capital fund. The results of this fifth question are presented in the 'other risks' section of this subchapter.

4.2.1 Risks in raising a venture capital fund

All of the interview respondents identified the risk of failing to reach the first close of a fund as the most important risk during the process of raising a venture capital fund. This result is line with previous studies and venture capital literature, and is largely caused by the singular focus towards raising capital at this stage in a fund's lifecycle. As a result of this single focus to close the fund, most of the risks in this stage are subordinate to the main risk of failing to reach the first close of the fund. The respondents had fairly identical opinions on what are the most significant subordinate risk factors for raising a fund. They included factors such as quality of the management team, investment strategy and the general condition of the financial markets. According to the interviewees, inexperienced management team with no track record or with a weak track record is one of the most important risk factors that affect the success rate of a successful fund close.

Another significant risk factor was the investment strategy; not being able to differentiate from other funds or targeting challenging niche sectors and sectors where large amounts of capital had already been raised were seen as disadvantages in the capital raising process, and thus decreasing the likelihood of successfully closing a fund. Economic downturns and weak financial markets were also brought up by most of the respondents as a risk factors that often have a material impact on the risk of failing to close a fund. Some of the interviewees additionally mentioned the importance of finding an anchor investor to the fund whose presence in the fund gives it a certain level of validation in the eyes of other possible limited partners. Not being able to find this initial investor is a red flag to other investors, and therefore it has a direct correlation with the risk of not being able to raise enough capital to close the fund.

4.2.2 Risks in making investments

Risks associated with the venture capital investment process were divided into the risks of the actual investment process, which includes sourcing, screening, due diligence and negotiating investment terms, and into risks inherent in the business operations of the investees. This separation was done in order to present a more comprehensive analysis on the actual investment process-related risks; from a venture capital company's perspective, the risks in the latter category are indirect risks, which only affect the venture capital company by impacting the valuation of their investments.

During the interviews the respondents of the study brought up relatively varying views on the risks of the investment process. However, there were several investment process risks and risk factors that recurred in majority of the interviews. The two most important risks mentioned were the loss of time and money and reputational damage. Additionally, some of the respondents saw that weak deal-flow, resulting in limited amount of investment opportunities, was also a substantial risk associated with the investment process. The risk of losing time and money in the investment process was referred to inefficient and negligent screening and due diligence processes that are not fast and accurate enough to separate investments opportunities with high growth potential and acceptable risks from other investment opportunities that do not meet the set investment criteria. In addition to causing unnecessary waste of time and money, several interviewees pointed out that negligent due diligence process creates a risk of making investments in companies that have unidentified or incorrectly evaluated specific risks or agency risks, which, as previously mentioned, are indirect risks for the investor, and may have serious implications for investment returns.

The risk of causing reputational damage during the investment process was likewise a notable risk for all of the interviewees. Treating startup entrepreneurs and potential investees in an inappropriate manner, such as procrastinating the investment decision or suddenly pulling out of a deal that is in due diligence stage without proper explanation, has a high risk of damaging the venture capital investor's reputation among the startup and venture capital communities. Calculating the actual monetary value of damaged reputation is particularly difficult for venture capital companies, because in most situations the damage is manifested as reduced deal-flow and a decreased level of interest from startup companies looking for funding, as well as from other investors who are looking for co-investors in funding deals. Some of the respondents also saw that competing sources

of financing, such as product and equity crowdfunding, revenue financing and business loans, and poor deal sourcing processes are risk factors that have similar deal-flow impacting consequences as reputational damage. Moreover, they thought that a very broad generalist approach to investing or very strict investment specialization both bring their own set of risks to the investment process. Generalist approach has often potential for higher deal-flow, but has increased risk of inadequate due diligence when making investments in companies in highly complex industries. Conversely, very narrow specialization in specific industry or niche sector enables conducting deeper and more granular due diligence, but at the same time increases the risk of insufficient deal-flow.

4.2.3 Risks in managing portfolio and making follow-on investments

All of the interviewees had fairly identical views on the risks that venture capital investors face during the portfolio management phase and while making follow-on investments in portfolio companies. The general consensus was that this phase in a venture capital fund's lifecycle involves mostly indirect risks which are related to individual portfolio companies' business risks. However, certain operational risks were also mentioned, including negligent follow-on investment due diligence, inappropriate treatment of portfolio companies and careless investing of excess capital. The first two of the mentioned risks, negligent follow-on due diligence and inappropriate treatment, are highly identical and in most cases directly comparable to the due diligence and reputation risks that the interviewees brought up when they were asked about the risks in a venture capital fund's investment phase. Careless investing of excess capital was explained as a risk factor that increases the possibility of making hasty investment decisions that are not thorough enough. In a situation where a fund's investment period is nearing the end, or has already ended, and it still has a significant percentage of its committed capital left to invest, the fund managers might attempt to deploy the committed capital instead of telling their limited partners that they were not able to find enough investment opportunities to invest all of the fund's committed capital. Attempting to invest large amounts of capital in a short time frame typically requires the venture capital investor to lower its investment criteria and conduct a shortened due diligence process, thus increasing the likelihood that the venture capital investor is not able to identify and properly evaluate all material risks before making an investment decision. Furthermore, according to several respondents, lowering the

investment criteria in order to reach higher deal volume or size forces the venture capital investor to also accept higher amounts of and more severe identified and evaluated risks.

4.2.4 Risks in exiting investments and dissolving a fund

Similarly as with the risks of portfolio management phase, most of the interviewees had quite similar opinions on the risks associated with exiting investments and liquidating a venture capital fund. The observations brought up in the interviews included pushing a portfolio company to an exit too early, disagreements between investors and founders about when to pursue an exit, and the risks of an exit through an initial public offering versus the risks of an exit through an acquisition. Several interviewees described that the risk of a premature exit typically emerges when a venture capital fund is approaching its target liquidation date, and as a result, the fund starts actively pursuing the liquidation of its remaining investments in order to be able to dissolve the fund and return the fund's capital to its limited partners. If a portfolio company is not ready or properly aligned for an exit transaction, it is highly likely that the exit value of the company will be lowered substantially due to the rushed exit event. Furthermore, a portfolio company's unpreparedness to an exit event may cause an ongoing exit process to fall through, which can put the company out of business if it does not have enough capital to continue to run its operations without the planned exit event, and the existing investors are not willing to invest more capital in the company.

Disagreements among investors and founders about exit strategy, namely timing of the exit and what exit vehicle to choose, was another risk that was pointed out in the interviews. Disagreements and differing opinions about the best exit strategy can be formed either between investors themselves or between investors and founders of the company. Additionally, disagreement between the investors and founders can also concern how long the founders and management team have to work for the acquiring company post-acquisition. These disputes, as explained by the interviewees, can decrease the current valuation or a potential exit valuation of a portfolio company in several different ways, such as taking the founders and management team's focus off the core business operations, preventing the sale of the company during a window of opportunity or hampering the company's ability to raise additional capital.

During the interviews, the interviewees were also asked to compare the risks of an exit through an initial public offering versus the risks of an exit through an acquisition from a venture capital investor's perspective. The results of this question were mixed; most of the interviewees saw that it is not possible to say which exit vehicle is absolutely better from risk management perspective, rather, the risk level of both an IPO and acquisition is highly dependent on a myriad situational factors, including the general condition of financial markets, industry and company specific factors, investor preferences, potential lock-up periods and other terms of the exit.

4.2.5 Other risks

The purpose of the last question regarding a venture capital company's risks was to identify and examine those risks that are not necessarily directly tied to an individual venture capital fund's lifecycle, but rather encompass the whole venture capital company and all of its operations, including all of its funds. The responses to this question were highly identical; the single most important risk identified was reputation risk, which was followed by somewhat less significant key person and cyber security risks. Majority of the interviewees divided the reputation risk into two different categories based on what stakeholder relationships are damaged. The first category included those reputation risks that, if occurred, damage the venture capital company's reputation with its limited partners, whereas the reputation risks in the second category were comprised of those risks that have the potential to damage the venture capital company's reputation with its portfolio companies, co-investors and the whole startup community. Furthermore, both of the categories have unique risk factors that influence the likelihood and severity of each respective category's reputation risks.

The interviews illustrated that in the case of reputation risks that are linked to limited partners, the most essential risk factor is the venture capital company's capability to generate high enough returns for its limited partners. If a fund raised by a venture capital company clearly misses its targeted internal rate of return, it will most often severely impair the venture capital company's ability to raise another fund and damage its reputation with existing and potential limited partners. The second category of reputation risks, linked to a venture capital company's reputation with its portfolio companies, co-investors and the startup community, is mostly affected by how the venture

capital company manages its relationships with the aforementioned stakeholder groups. Behavior that is seen as unethical or immoral, such as dishonesty, opportunism and disrespect, is likely to cause substantial reputational damage with these groups, and consequently reduce the venture capital company's deal-flow and access to other new investment opportunities. When the interviewees were asked if they prioritize one risk category over the other, approximately half of the interviewees emphasized the importance of the reputation risks concerning limited partners, while the other half did not see a major difference in importance between the two categories.

Other entity level risks mentioned by the interviewees included key person risk, cyber security risk, currency risk and country risk. The interviewees had varying views on how important these risks are in a venture capital company's core operations, for example, some of them saw cyber risks, such as data leaks and breaches, as a noteworthy risk, whereas other interviewees were not concerned about cyber risks and did not attempt to actively identify and manage them. The risk of currency fluctuations affecting exit returns or the risk of losing a key person were acknowledged and identified in majority of the interviewed venture capital companies and investment firms, but only a couple of them perceived them as threats that needed proactive risk management measures, such as using derivatives to hedge currency risk or key person insurance to compensate the financial losses caused by a key person's death or extended incapacity. Country specific risks that are directly associated with the venture capital investor itself, such as adverse political and regulatory changes, were a focus point to some of the interviewees in their risk management efforts, but most of the interviewees saw them as fairly minor risks that do not have material implications for their core operations.

4.3 Venture capital risk management methods

In this section of the chapter the findings and results of the risk management portion of the conducted interviews are presented. The risk management segment of the interviews consisted of the eight following risk management methods: (a) portfolio diversification, (b) due diligence process, (c) financial contracting, (d) syndication, (e) staged financing, (f) selection of board and management team members, (g) monitoring of portfolio companies, and (h) specialization. Additionally, the interviewees were also asked if they were using some other risk management

methods to identify, evaluate, control and monitor risks in their operations in addition to the methods presented by the interviewer. The results of this question are presented in the 'other risk management methods' section of this subchapter.

4.3.1 Portfolio diversification

The first interview question regarding venture capital risk management methods involved diversification of investments as a risk management technique. The results were highly consistent; all of the interviewees strongly supported portfolio diversification and actively used it as a part of their risk management process. As previously stated in the theory section of this study and confirmed by the interviews, the unique nature of venture capital equity's return distributions and the low survival rate of startup companies mean that diversification is a crucial part of all venture capital investing and risk management. However, creating a well-diversified venture capital portfolio requires a strong deal-flow that presents the venture capital investor with enough opportunities to invest in wide range of companies with different risk factors, such as industry, location and investment stage of a company. For the majority of the interviewees, the most important part of a successful diversification strategy was diversification of investments across different industries, sectors and vertical markets, followed by other diversification factors such as geography, time and investment stage.

According to the interviews, diversifying investments across multiple industries, sectors and vertical markets enables venture capital investors to mitigate industry specific risks that their portfolio companies have. Additionally, adequate diversification balances and protects against the cyclical movements that are inherent in many of the industries and sectors that receive venture capital funding. Geographical diversification was actively used by some of the interviewees to reduce country risks, such as economic uncertainties, volatile political environments and unpredictable regulatory changes. However, in addition to risk management purposes, geographical diversification was also used to discover new lucrative investment opportunities and to expand business networks to new countries, cities and markets. Those interviewees who did not actively use geographic diversification, explained that they had decided to focus on mostly one or a couple

of countries due to their experience and understanding of local markets, culture and regulatory environment.

4.3.2 Due diligence process

The interviewees of the study were unanimous about the importance of a due diligence process as a part of a venture capital company's risk management. Passing a thorough enough due diligence process was a requirement for all of their investments. The information collected in the interviews showed that all of the interviewees had somewhat varying views and principles about the process and purpose of investment due diligence. Factors such as fund size, investment thesis and the backgrounds of the fund's general partners had a significant influence how interviewees structured and conducted their due diligence process. Larger funds with more generalist approach had deeper, more complex and slower due diligence than smaller highly specialized funds with general partners who are experts in their fund's sector. The depth and length of the process was also dependent on the company that was subject to the due diligence process; seed-stage companies had significantly shorter and lighter due diligence compared to investments made in growth-stage and later-stage companies, which could take up to two months to complete the full process.

However, the interviews revealed that there were certain aspects that most of the interviewees had implemented in their due diligence processes rather similarly. For example, the due diligence process was in most cases divided into two different parts, a screening process and a formal due diligence process, which both had different objectives in supporting an informed investment decision. The screening process was primarily used to assess the return potential and the most crucial risks of a proposed investment, whereas the formal due diligence process was used to confirm previously received information as well as to expose any undetected issues with the business or the founders. In addition to separating the due diligence process into two different phases, majority of the interviewees used third-party experts in the latter phase of the due diligence process to conduct legal, financial and technical due diligence. The purpose for using outside expertise was to ensure that any material risks or potential issues would not pass through the due diligence undetected because the venture capital investor did not have enough understanding or experience on certain subject matter, such as legal financial or technical audit.

4.3.3 Financial contracting

As with diversification and due diligence, all of the interviewees expressed that proper contract terms are an essential part of their risk management procedures. However, the interviews showed that some of the investors gave more emphasis to carefully created investment agreements with robust provisions and clauses, while others attempted to use less contractual terms and focus more on building strong relationships and trust with their portfolio companies. The two most common provisions among the interviewees were vesting rights and liquidation preference. Additionally, drag-along rights, tag-along rights and redemption rights were also actively used by some of the interviewees in their investment agreements, while all of them preferred straight equity investments over investments made through convertible loan instruments.

Multiple reasons were presented for the use of contractual provisions during the interviews, including the ability to steer and control portfolio companies, prevention of conflicts and disputes, incentivizing founders and key employees, and to clarify and facilitate exit events. Having a certain level of control or influence over a portfolio company's decision-making and major strategic choices was an important aspect of contracting for all of the interviewed investors, although, as previously noted, some of the investors used looser controlling contract terms and avoided certain protective provisions completely in order to create trusting relationships with their portfolio companies. Another significant use for contractual terms was to prevent and quickly resolve any conflicts or disputes between the investors and founders or between the investors themselves. Many of the interviewees explained that these kind of internal issues can severely harm a portfolio company's focus on building its business, cause unnecessary costs and even block a potential exit deal. As well as using contracting for controlling and preventing conflicts, all of the interviewees also used vesting provisions to motivate their portfolio companies' founders and to align the interests between the both parties. A major reason for creating an appropriate founder vesting schedule was to reduce the risk of founders leaving, and mitigating the impact if it still happened.

4.3.4 Syndication

Unlike the three previously presented venture capital risk management methods, syndication did not receive unanimous support from the interviewed investors as an essential risk management method. Nonetheless, all of the interviewees told that they actively participate in syndicates as part of their investment operations. The motives behind syndicating were mainly twofold: some of them saw syndication as an important way to diversify the risks associated with individual investments, whereas others deemed it as more of a method to collaborate and exchange information with other investors in the syndicate. Sharing some or all of the costs of due diligence process was also mentioned by some of the interviewees as a motivation for syndication, although it was not seen as important as the other two abovementioned main sources of motivation for syndication.

Those interviewed investors who used syndicating mostly as a risk management method, were more likely to either start a syndicate or join a syndicate as the size of the investment increased. Syndication enabled them to make smaller and more diversified investments in later-stage companies that were raising large rounds of funding. As part of a syndicate, they were able to allocate less capital to individual investments, and thus participate in funding rounds that would have otherwise been too large and risky for them. As for the interviewees who saw syndication as a tool for collaboration and exchange of information, the decision to start or join a syndicate was in most cases resource and expertise-driven. The main purpose was to pool investor resources, including data, skills, contacts and subject-matter experts, in order to make a more informed investment decision and to support the growth of the syndicate's investment. Furthermore, according to some of the interviewees, higher negotiating power of a syndicate gave them a stronger position in investment negotiations and more influence and control over an investee's board of directors after the investment had been made.

Syndication was also mentioned as an important channel for deal flow due to the fact that co-investors in one syndicate often times offer each other opportunities to invest in other syndicated deals. In order to be able access this channel, it was essential to provide value to the syndicate and the investment, and to treat other syndicate members and the investee company with respect and integrity. However, many of the interviewees emphasized that, even though building good relationships with other syndicate members is an important opportunity to generate more

investment opportunities, making investments in a syndicate also introduces new risks due to the collective nature of a syndicate; every member of syndicate is an individual entity with its own interests, motivations and ways of operating. This means that one or more syndicate members might take actions or behave in a manner that is detrimental to the syndicate's investment or its other members, either intentionally for its own benefit or unintentionally due to its ignorance or incompetence. In order to avoid and mitigate this co-investor risk, the interviewed investors assessed the quality and reputation of any potential co-investors before joining a syndicate or entering into a deal.

4.3.5 Staged financing

Out of all the risk management methods presented to the interviewees, staged financing proved out to be the most divisive. Half of the interviewees did not use staged financing in any form, while the other half were actively using it in their deals to manage investment risk. The answers of the interviewees indicated that the use of staged financing was connected to the size of the investor: large investors preferred making their investments in clearly defined and separate funding rounds, whereas smaller investors were in many cases dividing their investments in smaller installments that were disbursed either according to predefined milestones or entirely at the discretion of the investor. For the interviewees of the study, the main purpose of staging investments was to reduce investment risk by combining time diversification, continuous monitoring of investments and the option to discontinue funding. In practice, this meant that the investment sum was spread over a specified time period where the investor monitors the investment and makes periodic decisions about whether to continue or discontinue funding.

Those interviewees who used staged financing to reduce their investment risk preferred in most cases not to set predefined milestones due to the constant changes and alterations which early-stage companies have to implement in order to find a viable business model and product-market fit. When staged financing was done without predefined milestones, the interviewees used different key performance indicators, such as revenue growth, cash burn, amount of users and market adoption to determine whether they should continue to fund a portfolio company. In addition to reducing investment risk, interviewees also explained that, as a result of not disbursing the funding in a single

tranche, staged investments provided them with more control and visibility into their portfolio companies. Investee companies were more motivated to be transparent and receive guidance from the investor when they were in a situation where they had to show adequate execution and progress in their business in order to receive the next tranche of capital.

4.3.6 Selection of the board and management

Being able to select members to the board of directors and to influence the selection of the executive management team was a significant risk management method for almost all of the interviewees. A board seat was so important right that many of the interviewed investors were not willing to invest without it. The person nominated to the board was in most cases either a general partner or an independent director familiar to the investor. The interviews indicated that the choice between placing a general partner or an independent director on the board of directors was connected to a portfolio company's growth stage and size of the business; general partners were placed more often on early stage boards, whereas independent directors typically had board seats on more mature growth stage companies. The rationale behind nominating an independent director was to put an industry expert on the board who can help the portfolio company to grow the business, control industry related risks and avoid making mistakes typical to the portfolio company's industry or market.

The most important ways in which a seat on the board of directors contributed to the overall investment risk management was the opportunity to closely monitor what happens inside a portfolio company and steer the business towards desired direction. According to the interviewees who demanded a board seat, the risk of moral hazard was significantly reduced when they were able to place their own partner, employee or representative on the board of directors, due to the comprehensive access to a portfolio company's information. Some of the interviewees also used their position on the board of directors to guide and instruct the respective portfolio company to implement proper risk management framework in order to control and manage threats such as liability and data protection risks.

4.3.7 Monitoring of portfolio companies

The answers received to the question about monitoring of portfolio companies were very much aligned with the information presented in the theory section of this study, as all of the interviewed investor emphasized that continuous portfolio monitoring was an essential part of their investment operations and risk management. When observed particularly from the perspective of risk management, the purpose of monitoring was to provide actionable data to the venture capital investor on how a portfolio company's existing risks are changing and if new risks have emerged after the initial due diligence process.

The most common ways to conduct monitoring, in addition to board meetings, were weekly, monthly and quarterly meetings and reviews where the investment teams reviewed business factors, such as key performance indicators, latest business developments, risk maps, valuation and competitor and market analyses. Every interviewee had their own set of specific key performance indicators that they used in their monitoring process, but most of these indicators were predominantly used for monitoring revenue, sales, user traction, profitability and burn rate. For some of the interviewees, the frequency of monitoring was dependent on the performance of a portfolio company: if a portfolio company was executing at or above its projected performance, it did not require as much monitoring as a portfolio company which was not performing as projected.

In addition to formal meetings and reviews, monitoring also occurred through different informal channels, including informal meetings, phone calls and emails between the investment team and the portfolio company. Several interviewees emphasized that part of their monitoring also included communication with regular employees in order to observe if the information received from the CEO and the executive team matched the information and observations that the employees had. Communicating across the whole organization, instead of only relying on the executive management, made possible to detect risks and uncertainties that the management was either unaware of or deliberately withholding from the investor.

4.3.8 Specialization

Specializing in specific industries, verticals or markets was the least popular risk management method among the interviewed investors. Most of them thought that, as a risk management method, specialization meant deeper understanding of industry specific risks and how to control and mitigate them. However, most of the interviewees had a more or less generalist approach in their investing, which allowed them to have a more opportunistic investment strategy compared to a strict specialization strategy. This opportunity to make investments in a wide range of different sectors and fields was seen more beneficial in most cases than limiting the scope of investments only to those sectors where the investor had deep specialized industry knowledge. Several interviewees also noted that maintaining high-level knowledge of most venture capital backed industries requires a lot of time, resources and exposure to the industry in question. As a way to circumvent the problem of maintaining extensive industry knowledge, approximately half of the interviewees used outside consultants and industry experts in their due diligence process when they were considering making an investment in a company that operated in a sector, space or market that the investor did not know thoroughly enough. In addition to the initial due diligence, consultants and industry experts were also used in the later stages of the investment life cycle to provide assistance with examining available exit options for the investor.

4.3.9 Other risk management methods

The last question of the interview gave the interviewees an opportunity bring up any other risk management methods that were not presented in the previous questions. However, based on the answers received, the interviewed investors did not recognize other additional significant risk management methods in addition to the methods presented in the previous interview questions. A few less significant or irregularly used risk management methods and techniques were introduced, such as purchasing liability insurance, using the quality of investors interested in a potential investment as a risk indicator, and evaluating if a startup company has valuable intellectual property rights that can be sold in the event that the company turns out to be a failure.

These methods were mostly introduced and used by individual interviewees, and did not have widespread adoption among all of the interviewees.

5 CONCLUSIONS

Startups and early-stage growth companies play an important part in economic growth and development all around the world; they create new jobs, products, services and business models that increase productivity and welfare. However, a vast majority of these companies initially burn more cash than what they generate when they are starting the business, and majority of them fail during the first five years from incorporation. This means that they need to raise capital to in order to finance business operations and growth, but at the same time the high risk of failure typically prevents these businesses from having access to debt funding. As a result, equity financing is the only option available for most startups and early-stage growth companies. The capital invested in these companies is called venture capital, and because these are highly risky investments which typically require a long time to mature and an extensive understanding of the respective company and the market it operates in, most of the venture capital investments are made by specialized financial institutions called venture capital companies. These investment entities focus solely on making investments in startups and early-stage growth companies, attempting to generate above-market returns by taking higher risks in their portfolio investments.

Making investments solely in high-risk startup and early-stage growth companies means that venture capital companies have to implement sophisticated and robust processes to identify, analyze, manage and monitor wide variety of different risks associated with small and fast-growing companies that are often developing cutting edge technology and creating new innovative business models. In addition to investment risk, venture capital companies also have to manage company level risks that are related to business operations and factors, such as reputation, capital raising process, financial contracting and exiting investments. Effective company level risk management processes and strategy ensure that the core investing operations are able to function efficiently without disruptions or wasting unnecessary time or money. However, although the importance of risk management for venture capital companies is clear due to the multitude of risks and uncertainties that arise from investing in startups and early-stage growth companies, there is only a relatively moderate amount of research and studies that examine how venture capital companies

create and structure risk management strategies and integrate different risk management processes into their core business processes on a company level.

This study aimed to understand how venture capital companies structure their risk management strategies and processes on a company level, what are the most important risks venture capital companies face and what risk management methods and techniques venture capital companies use to control and mitigate these risks. To answer these research questions, a qualitative research method using semi-structured interviews for data collection was adopted. This method enabled a thorough in-depth study of the research questions and allowed the researcher to investigate each interviewees' motivational factors behind using or not using different risk management strategies, processes and methods. In order to make the study as comprehensive as possible within the limitations of the study, the researcher first conducted an extensive review of the existing literature and studies on venture capital risk management in the theory section of the study, and subsequently proceeded to form the interview questionnaire and conduct the interviews by using the data from the theory section of the study.

Based on a qualitative analysis of the interview data, it can be concluded that the interviewed venture capital companies did not have a formal company level strategy for managing risks, but instead, most of them used a standardized risk management framework for evaluating the risks and return potential of individual investments. Accordingly, their risk management efforts were mainly focused on the screening and due diligence processes for potential investments, and, to some extent, monitoring of portfolio companies and completing exit transactions. The results indicate that venture capital companies, as organizations with relatively few employees and the sole purpose of investing in startups and high-growth companies and helping them grow and finally selling their stakes in those companies, are able to manage their risks without creating a formal company level risk management strategy or complex company level risk management structures. This finding is also supported by the scarcity of previous studies and literature on company-wide risk management of venture capital companies. Furthermore, the collected data also shows that most of the interviewed venture capital investors did not recognize company level risk management as a major differentiator or competitive advantage when raising capital or sourcing new investment opportunities.

The interview data regarding the most important risks and risk management methods for venture capital companies indicates that the industry has a fairly standardized set of notable risks and risk management methods that are used to control and mitigate those risks. However, when analyzing these results, it is also important to notice that the study excluded all portfolio company specific risks in order to be able to examine exclusively the risks that venture capital companies face directly in their operations. As a result, the data shows that reputational risks, risks concerning insufficient or inadequate screening and due diligence processes, and the risks of a premature exit transaction had the highest importance of direct operational risks for the interviewed venture capital companies. These findings are in line with general venture capital risk management literature and previous research. They confirm that maintaining a good reputation with limited partners, portfolio companies and all the other startup ecosystem stakeholders is crucial for venture capital companies. The market for venture capital is highly competitive and the differences between various venture capital companies are often very small, thus a good reputation is an important competitive advantage when raising capital and sourcing new investment opportunities. Additionally, the results regarding risks in screening and due diligence processes show how valuable resource time itself is for venture capital companies. Because most venture capital companies screen hundreds, some even thousands, of possible investments per year, they require highly effective time management. Each individual partner of a venture capital company has a finite amount of time for finding, reviewing and closing new investments, which means that mistakes or inefficiencies in these processes can end up wasting significant amounts of their time.

On the risk management side, the data illustrates that the most important methods for controlling and mitigating risks were portfolio diversification, thorough screening and due diligence processes, active monitoring of portfolio companies and careful financial contracting. These results, and particularly the significance of portfolio diversification, are consistent with the general venture capital risk management literature and other studies conducted on the subject of venture capital risk management. These findings further confirm that due to the high-risk nature of venture investing and the difficulty to predict which startup companies are likely to survive and grow, diversification of investments is the most effective way for venture capital companies to control and mitigate the investment risk. The study also shows that a well-diversified portfolio helps to mitigate liquidity

related issues by spreading out these transactions along the lifespan of a venture capital fund. Moreover, the findings in general indicate that venture capital companies focus their risk management efforts more on pre-investment processes, such as diversification, due diligence and contracting, than post-investment processes, which are directed more towards guidance and assistance rather than just pure risk management. This suggests that from a venture capital company's perspective, after an investment has been made, the remaining risks are mostly indirect portfolio company specific risks which are managed by the respective portfolio companies, and thus, in most cases, the venture capital company can only try to control these risks through offering their portfolio companies advice and support on risk management matters.

The choice to use a qualitative research method to conduct the study and semi-structured interviews for data collection was made in order to provide deeper understanding and insights into key factors affecting risk management in venture capital companies. However, this research design brings a number of limitations that should be kept in mind when interpreting the results. Firstly, the small sample size of the study limits the generalizability of the results and may also affect the strength of conclusions drawn from the analysis of the interview data. Secondly, the amount of time reserved for the phone interviews was not enough in some of the interviews, which meant that the pace of those interviews had to be sped up. This may have affected how the interviewees answered the interview questions, and therefore, the quality of the data collected from these interviews. Thirdly, as with all interviews, the researcher's interpretation of the answers received is always somewhat subjective. Different interviewers may understand and transcribe interviews in different ways due to different subjective factors, such as the interviewer's opinions, attitudes, expertise or background. Analogously, different interviewees respond differently depending on how they perceive the interviewer, which means that comparability is reduced because wording and sequencing will likely be different in each interview. Furthermore, due to the depth of the conducted interviews, it is possible that incorrect perceptions on the part of the interviewer with regard to what the interviewee said and misunderstanding on the interviewee's side with regard to what was asked, may have affected the reliability of the data collected from the interviews.

This study was performed using a qualitative approach for the purpose of establishing a baseline understanding of how venture capital companies perceive and implement risk management in their

core investment operations and supporting business functions. However, even though the study showed the importance of risk management in venture capital investing, further research on the subject is needed in order to produce results that are statistically significant. Therefore, I would recommend that future studies use a wide variety of both quantitative and qualitative research methods with large enough sample sizes to make statistically significant conclusions. Future studies should also take into account the difference between direct risks, which the venture capital company can control at least on some level, and indirect risks, which cannot be controlled, but may still have a negative impact on the venture capital company. Furthermore, I would suggest that future research should consider how factors such as investment strategy, total amount of capital under management and preferred stage of investment affect the structure and implementation of risk management in venture capital companies.

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APPENDICES

APPENDIX 1: Interview questionnaire

1. Does your firm have a formal risk management strategy? If yes, what does it contain and why? If not, what are the reasons for not having one?

2. In your opinion, what and why are the most important risks for a venture capital firm during:
   (1) Raising a fund
   (2) Investing the fund's capital
   (3) Managing the fund's portfolio and making follow-on investments
   (4) Exiting investments and dissolving the fund

3. Do you see some other notable risks for a venture capital firm besides the risks that are related to a fund's life cycle?

4. Do you use any of the following measures to manage risks in your operations, and what are the reasons behind using/not using the method in question?
   (1) Portfolio diversification
   (2) Due diligence
   (3) Financial contracting
   (4) Syndication
   (5) Milestone-based financing
   (6) Selection of board and management

(7) Monitoring of portfolio companies

(8) Specialization to specific industries

5. Are you using some other risk management techniques or tools that were not mentioned in the previous question and why?