

Venture capital contracts in Norway

An analytical approach

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Abstract

In this thesis we have explored the venture capital market and whether the contractual mechanisms applied in Norwegian venture capital transactions are optimal for minimizing agent-principal costs. From a sample of Norwegian contracts, we extracted a set of the most frequently used contractual mechanisms which we compared to previous research conducted on the US venture capital market and to relevant financial theory. For analytical purposes we divided the mechanisms into two main categories; cash flow rights and control rights. The findings in this paper are that contractual mechanisms applied in Norwegian venture capital transactions contribute to minimize the agent-principal costs, even though there are some possible areas of improvement.

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Contents

Abstract	1
Acknowledgements	3
Contents	4
Table of figures	6
1. Introduction	7
1.1 Problem definition.....	7
1.2 Structure of the thesis.....	7
2. The Norwegian venture capital market	9
2.1 Definitions.....	9
2.2 Subcategories of venture capital.....	10
2.3 The investment process.....	11
2.4 PE in Norway.....	12
2.4.1 A brief overview.....	12
2.4.2 Development.....	14
2.5 Who supplies the capital?.....	15
2.6 Who receives the venture capital?.....	17
2.6.1 Target sectors.....	17
3. Theory presentation	19
3.1 Cash flow rights.....	20
3.1.1 Optimal financial claims.....	20
3.1.1.1 The model.....	23
3.1.1.2 Introducing convertible securities.....	26
3.1.1.3 Mechanisms of the convertible security.....	28
3.1.1.4 Summing up.....	34
3.1.2 Window dressing.....	35
3.1.3 Managerial remuneration.....	37
3.1.3.1 Pay-performance sensitivity.....	37
3.1.4 Other CF related contractual mechanisms.....	39
3.1.4.1 Automatic conversion.....	39
3.1.4.2 Anti-dilution provisions.....	40
3.2 Control rights.....	43
3.2.1 Distribution of control rights.....	43
3.2.1.1 The model.....	43
3.2.1.2 When actions are not verifiable.....	48
3.2.1.3 When actions are verifiable.....	51
3.2.1.4 Summing up.....	53
3.2.2 Control right mechanisms.....	54

3.2.2.1 Voting rights	54
3.2.2.2 Board rights	54
3.2.2.3 Liquidation rights	55
3.2.2.4 Redemption rights	55
3.2.2.5 Anti-dilution	56
3.2.2.6 Other mechanisms	56
3.2.2.7 Staging	57
3.2.2.8 Contingencies	58
3.2.2.9 Summing up, control right mechanism.....	58
4. Analysis	59
4.1 Data sample	60
4.1.1 Sources	60
4.1.2 Criticism	61
4.2 Cash flow rights.....	61
4.2.1 Financial claims.....	61
4.2.1.1 Liquidation preferences	61
4.2.1.2 Liquidation events	64
4.2.1.3 Redemption	65
4.2.1.4 Anti-dilution	67
4.2.1.5 Summing up: The most frequently observed structure.....	70
4.2.2 Pay-performance sensitivity	71
4.3 Control rights.....	72
4.3.1 Voting rights.....	72
4.3.2 Board rights	72
4.3.3 Redemption rights	75
4.3.4 Liquidation preferences	76
4.3.5 Anti-dilution	78
4.3.6 Non-compete and non-solicit clauses	79
4.3.7 Vesting.....	80
4.3.9 Drag along	82
4.3.10 ROFR and tag along	84
4.3.11 Staging.....	85
4.3.12 Summing up	86
5. Conclusion.....	88
Glossary	90
References:	99
Appendix	102

Table of figures

Figure 1: Firm's life cycle	8
Figure 2: The structure of venture capital	9
Figure 3: The investment process.....	10
Figure 4: PE investments in percentage of GDP	12
Figure 5: The distribution between buyout and venture capital.....	12
Figure 6: Establishment of new funds in Norway.....	13
Figure 7: Capital under management (M NOK) by phase	15
Figure 8: The investors.....	16
Figure 9: Geographical distribution of investors.....	17
Figure 10: The distribution of venture capital on sectors.....	18
Figure 11: Payoff structure and preferred risk exposure.....	21
Figure 12: Sequential occurrence of events	22
Figure 13: VC payoff in the different states.....	29
Figure 14: E payoff in the different states.....	31
Figure 15: Development of full ratchet vs. weighted average	40
Figure 16: Sequential occurrence of investment process events.....	46
Figure 17: Full participating.....	61
Figure 18: Simple participating.....	62
Figure 19: Full participating with redemption	66
Figure 20: Simple participating with redemption	67
Figure 21: Comparing full ratchet, weighted average and no protection.....	69
Figure 22: Most frequently observed structure	70
Figure 23: Comparing the effects of buy back and vesting.....	80

1. Introduction

1.1 Problem definition

"A bank is a place that will lend you money if you can prove that you don't need it."
(Bob Hope)

Earlier, banks and other passive investors were the prevalent source of funding. This type of financing did not back innovative high risk companies. However, today there is an emerging financial market which accepts higher risk exposure in exchange for the possibility of active ownership. This enables full funding without the involvement of banks and helps spur innovation.

Investors seeking high risk early stage investments are in general called venture capitalists. The relationship between the venture capitalists and their portfolio companies is still a quite unexplored domain of financial theory. This is especially an issue for the Norwegian venture capital industry, where there is also a shortage of empirical studies. Several important questions are still to be answered. The opportunities to explore new aspects, and hopefully make a small contribution to the field, attracted our attention to venture capital.

The relationship is governed by a contract where several provisions regarding the distribution of claims and rights are outlined. For the cooperation in the relationship to be efficient, the distribution has to be optimal. In this thesis, we want to analyse Norwegian venture capital contracts based on the following problem definition: Are contractual mechanisms applied in Norwegian venture capital transactions optimal for minimizing agent-principal costs?

1.2 Structure of the thesis

This paper will open with a general definition of venture capital and follow up with an overview and overall development of the Norwegian market (chapter two). Chapter three covers the relevant financial theory applied in chapter four. The theory is based on well known academic research studies. The aim of the theory presented is to achieve a first best investment solution, hence, minimizing the involved agent-principal cost. Parallel with the theory presentation, we have included an imaginary case example (box 1 to box 5).

In chapter four we analyze our empirical observations in light of the problem definition previously outlined. The findings are compared to the theoretically optimal contract structure, and summed up for respectively cash flow rights and control rights. In the end we have a final conclusion presenting results and highlighting the interaction between cash flow rights and control rights in general, as well as the possible complimentary effects of the different provisions.

Following the conclusion is a glossary explaining common venture capital expressions and phrases and an appendix presenting the check list applied in the data gathering process.

2. The Norwegian venture capital market

2.1 Definitions

Commonly spoken, private equity is a broad term which refers to any kind of equity investment in assets which are not freely traded on a stock-exchange. When consulting the European Venture Capital Association (EVCA), we get this definition: *Private equity (PE) is equity capital provided by investors to non-quoted companies with a high potential of growth.*

The goal of PE investments is to add value to the company through active ownership, which style will change accordingly to where the firm is in the life cycle. Dependent of the firm's life stage, we can divide the PE investments into two subsets: Venture capital (VC) and buyout. Throughout this paper we will focus on the VC part.

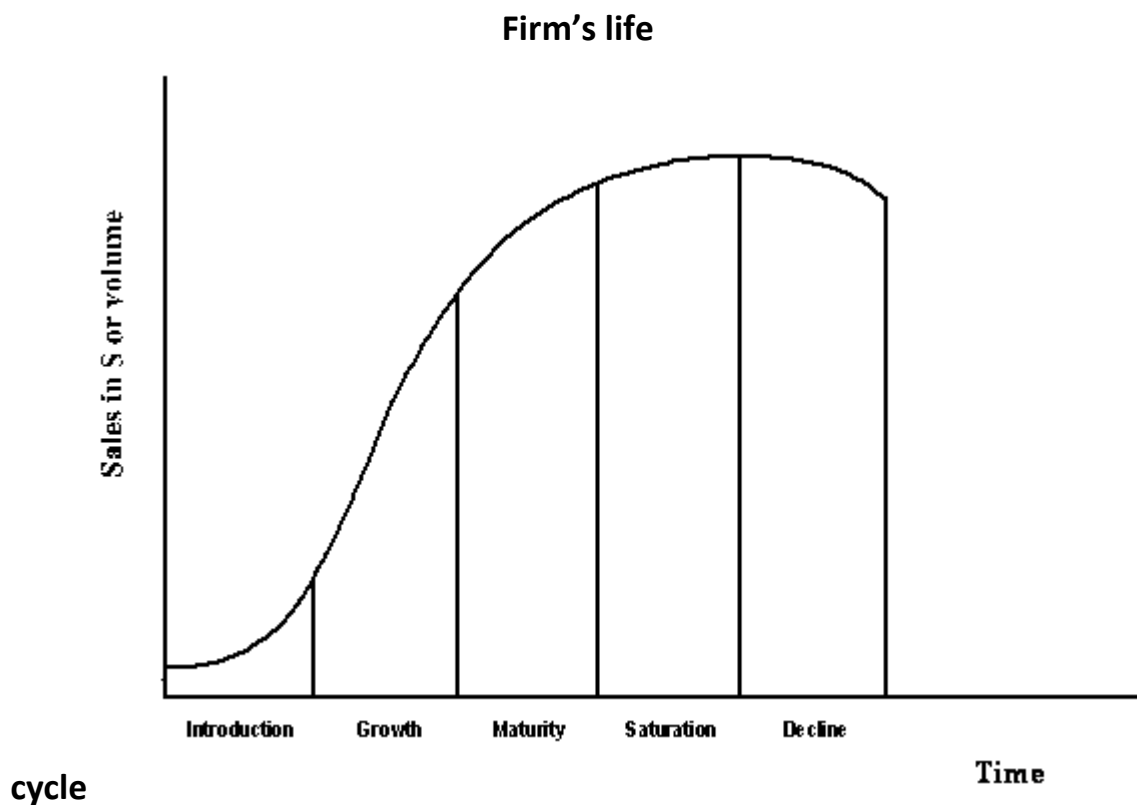


Figure 1: www.billyfire.com

VC is investments made in the early stages of the business' life cycle. It has a focus on entrepreneurial undertakings as opposed to buyouts which focus on mature businesses. The venture capital found works with the company to help it grow, but with the plan of selling their part of the company as it becomes more profitable. The exit is preferably done through IPOs, as they are found to be more profitable than private sales (Hege et al, 2006).

2.2 Subcategories of venture capital

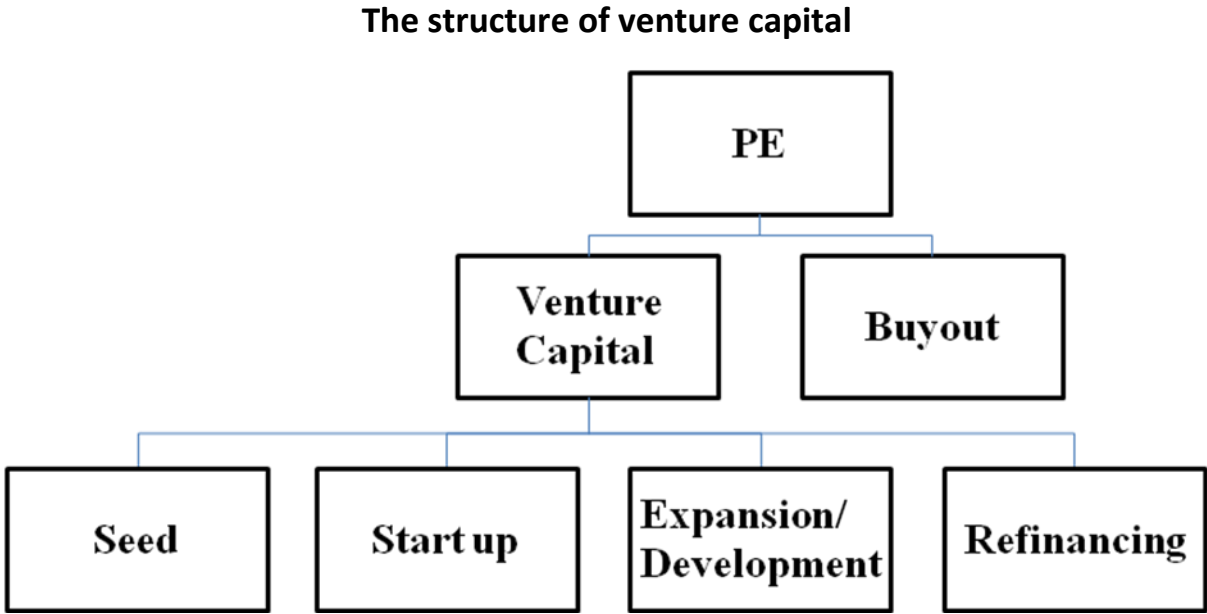


Figure 2: source: EVCA

When the investment is made before the company has actually developed a product or service, it is called a seed investment. These investments are used for assessing, researching and developing the concept of the business.

Start up investment is capital provided for product development and initial marketing in the first stages of development. In this phase, the company still has not sold their product or service on the commercial market.

Expansion stage financing, also known as development capital, is financing provided for the growth and expansion of a company. The company might now have reached the break even stage, or even run profitably. The expansion capital is usually used to finance increased

production capacity, finance market or product development and to provide additional working capital. The meaning of these investments is to help the company grow beyond a critical size to increase the profitability.

The last type of venture capital is refinancing. That is usage of capital to repurchase shares or reducing the company’s level of gearing.

2.3 The investment process

The private investor (limited partner) invests in a VC fund which is administered by a VC firm (general partner). In order to invest in the fund, they have to pay a purchase fee. The VC firm invests the fund in different companies which they find suited. In return for the cash, the fund gets equity in the companies. After a certain time (usually 3-6 years) the fund sells their holdings, and the sales profit is divided between the limited and the general partners according to up front agreements.

The investment process

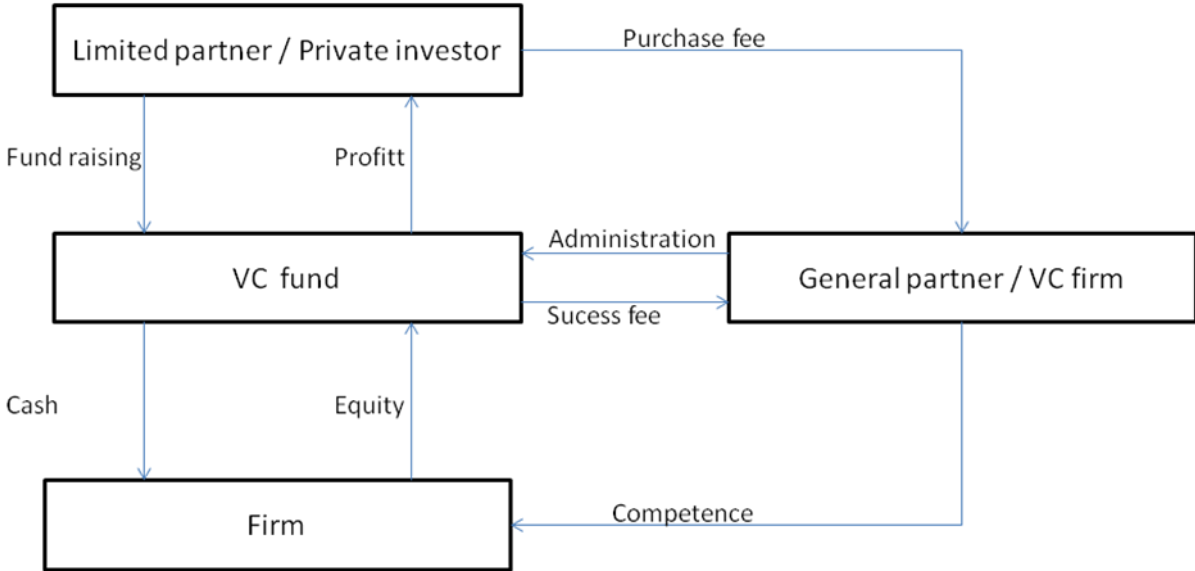


Figure 3

The general partner’s role is as follows: After raising the capital, they find suited investment objects through a screening process. Out of a huge number of possible objects, only one or two usually stands out as good enough investment opportunities to qualify for investments.

When the money is invested, the general partner contributes to their portfolio companies with different expertise. The expertise can relate to such as management, business, geographical area or market. Hopefully this active ownership role of the VC firm is going to create value for the company.

2.4 PE in Norway

2.4.1 A brief overview

Norwegian trade and industry is mainly dominated by small and medium sized companies (less than one hundred employees). This category comprises 99.4 per cent of all Norwegian companies (SSB 2007). If we narrow it down to less than 20 employees, still 95.3 per cent of all companies are included. This indicates that there should be numerous investment opportunities for investors willing to explore the venture market. However, the Norwegian venture capital market is immature and less sophisticated compared to other markets, such as in the US. Even Sweden, which at first glance appears to be quite identical, is further up the development ladder. As presented in figure 4, the Norwegian PE (includes both venture capital and buy out) investments are, in percentage of GDP, lower than the European average and significantly lower than in Sweden. Nevertheless, over the past decade the investment momentum has been increasing in all stages of the VC cycle.

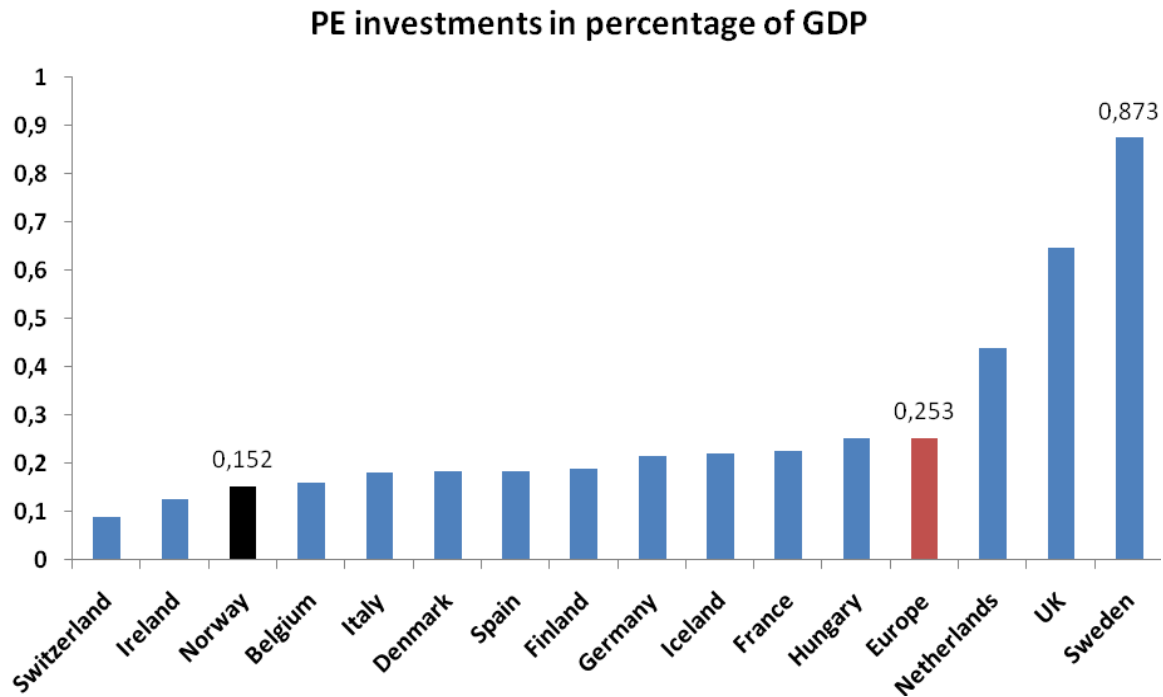


Figure 4: Source: EVCA

In Norway the distribution of capital committed to PE is somewhat different from most other countries. According to the Norwegian Venture Capital Association (NVCA 2007), of a total of NOK 37.5bn under management, 66 per cent is committed to VC and 34 per cent to buyouts (figure 5). When comparing to other countries, e.g. Sweden, the share of PE investments committed to VC is much higher.

The distribution between buyout and venture capital

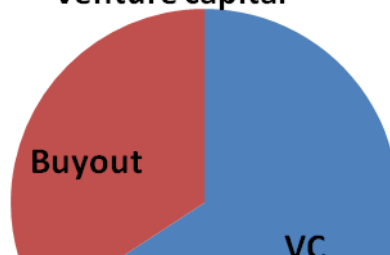


Figure 5: Source: NVCA

2.4.2 Development

During the 90s the focus on private equity investments in general increased significantly in the Norwegian capital markets. However, this did not affect the venture capital sector proportionally, which according to OECD experienced a decade of rather sluggish growth (OECD 2003). Nevertheless, the new millennium represented the beginning of a new era for the Norwegian venture capital industry. In 2001 the NVCA (Norwegian Venture Capital Association) was founded and according to a member survey approximately NOK 2bn was raised in new funds during year 2000. In the years to follow the industry experienced some fluctuations but on average annual growth has been positive, both in terms of capital raised and number of new funds established (figure 6). In 2006 the investments skyrocketed and the figures from the first half of 2007 do not seem to follow, furthermore, the ongoing credit crunch and the increased cost of funding will probably have a negative effect on the 2008 numbers.

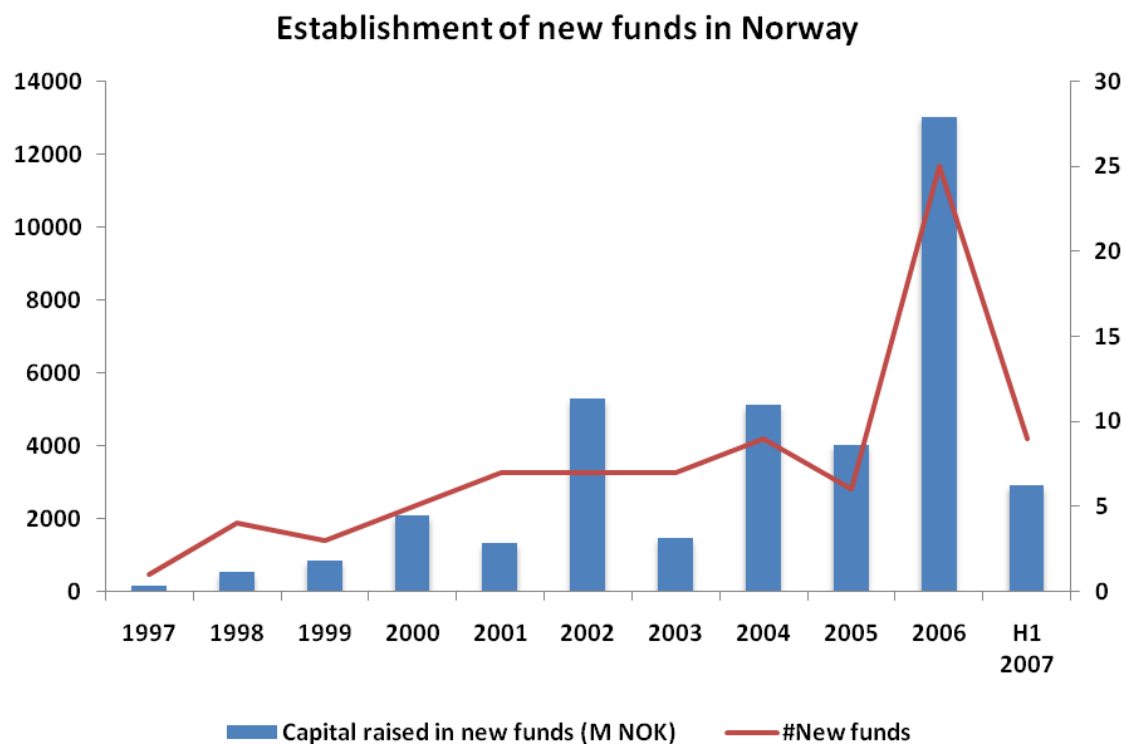


Figure 6: Source: NVCA, H1 2007

The recent growth in investment activity accumulates into a higher level of capital under management. The 2007 level is all time high. As presented in figure 7 the Norwegian Private

Equity industry is dominated by start-up/venture and Buyout. This has been the prevailing picture for almost a decade, however before year 2000 expansion was the dominating investment (OECD 2003). The growth in Seed is partly because of recent established government funds.

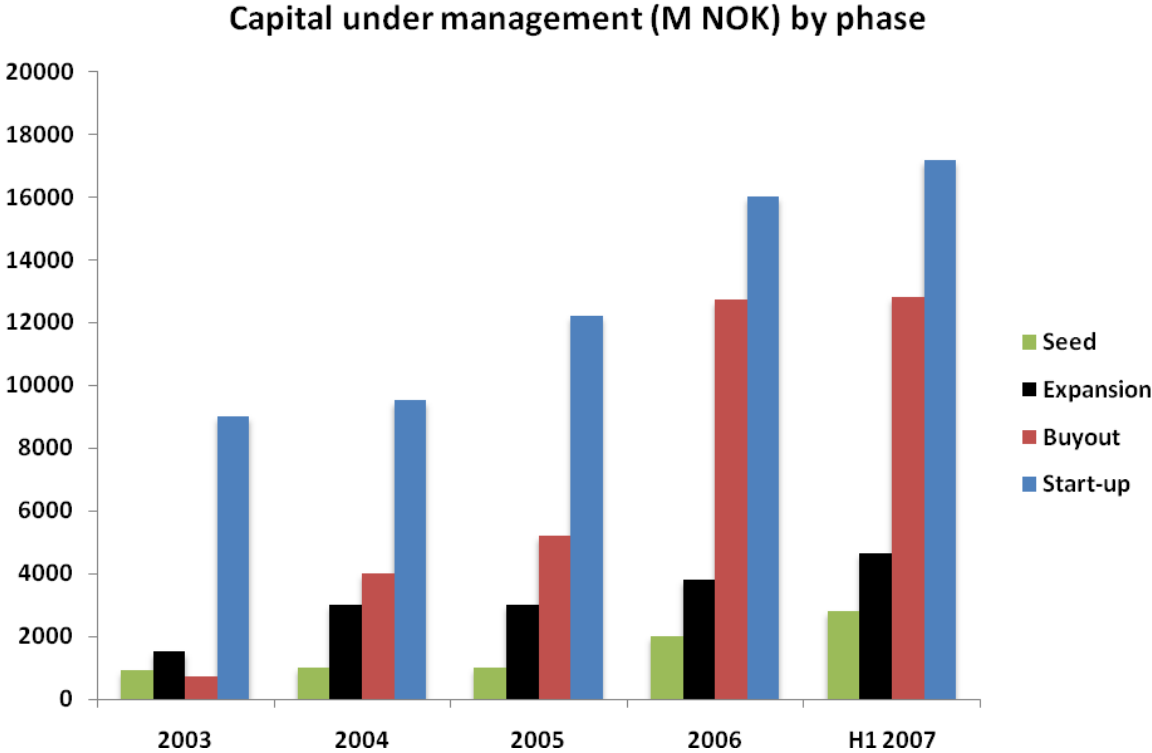


Figure 7: Source: NVCA, H1 2007

2.5 Who supplies the capital?

The main reason why investors choose to invest in VC is the prospect of a profit supreme to other investments. As information about VC investments is hard to find, it is difficult to say whether this actually is the case. Unlike publicly traded companies, most venture backed firms are not listed anywhere, and they face few requirements to publish information.

Almost all the investors (limited partners) are institutional (such as banks, insurance companies and mother companies) and have a portfolio perspective when investing in the venture capital sector. This justifies a VC investment even if the profit from venture capital is not supreme to other investment opportunities.

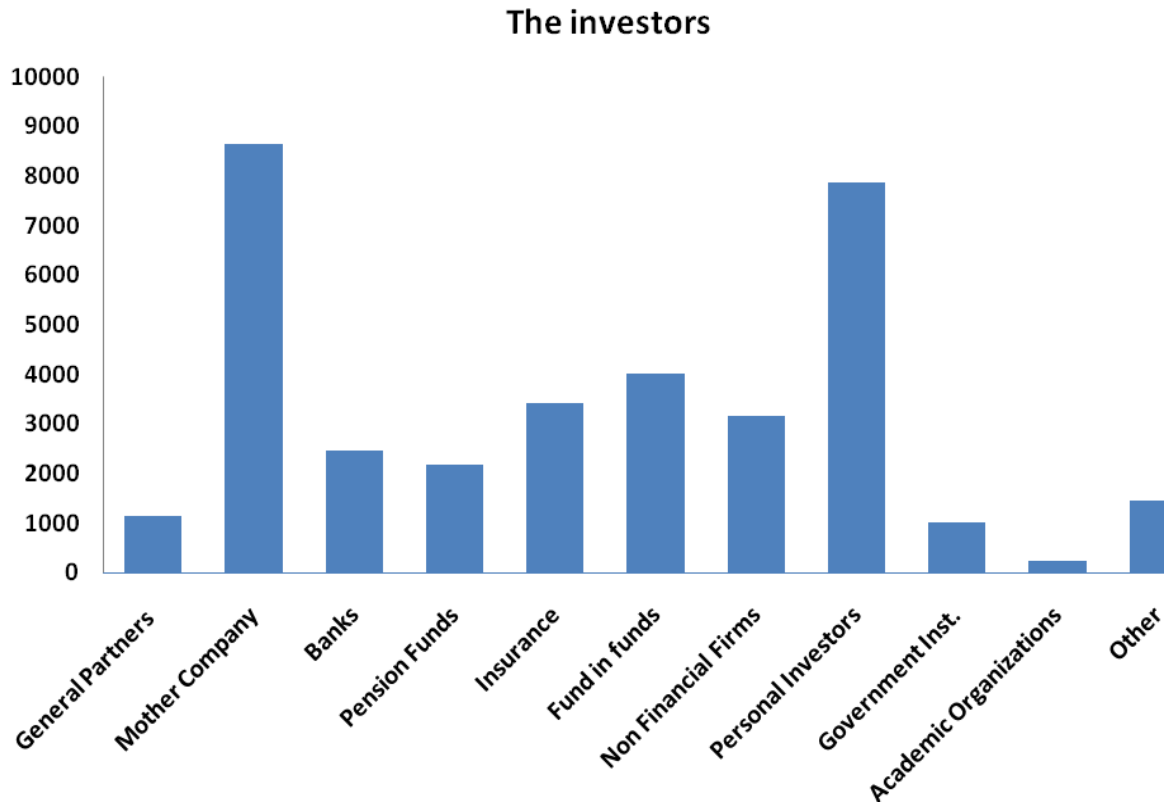


Figure 8: Source: NVCA

In Norway, the general partner side of the private VC sector is dominated by a few major players such as Ferd, Northzone, Verdane and Teknoinvest. In total there are 41 companies currently engaged in either the seed phase or the start up of VC (NVCA), but several of these are minor players without significant invested amounts.

Only a small minority of the general partners in the Norwegian VC market are foreign (figure 9). In the first half of 2007, 82.1 per cent of funds raised came from Norway, and only as little as 3.1 per cent was from investors outside of Europe (NVCA).

Geographical distribution of investors

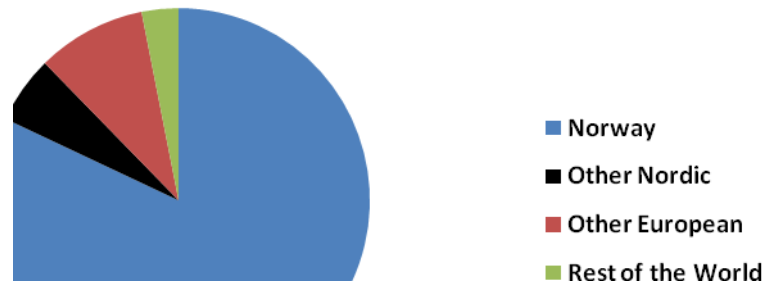


Figure 9: Source: NVCA

2.6 Who receives the venture capital?

VC is used as a source of finance for companies which cannot get traditional bank credit. When the company is too risky or the entrepreneur is too wealth constrained, they have no other choice than to give up certain control and cash flow rights through an equity sale in exchange for the cash needed to develop the firm.

2.6.1 Target sectors

Norwegian venture capital investments reflect the overall strength in recourse based industries and the developed information and communications technology (ITC) clusters. ITC has maintained its position as the strongest sector for years. But benefiting from the research and innovation capabilities accumulated through exploitation of the oil reserves in the North Sea, we see more and more successful start-ups serving the oil and gas industry. All other sectors, except Life Science & Biotech, are laggards (see figure 10). A traditionally strong (in an international perspective) VC sector such as retail and consumer service is surprisingly underrepresented in the distribution of Norwegian venture capital compared to other countries.

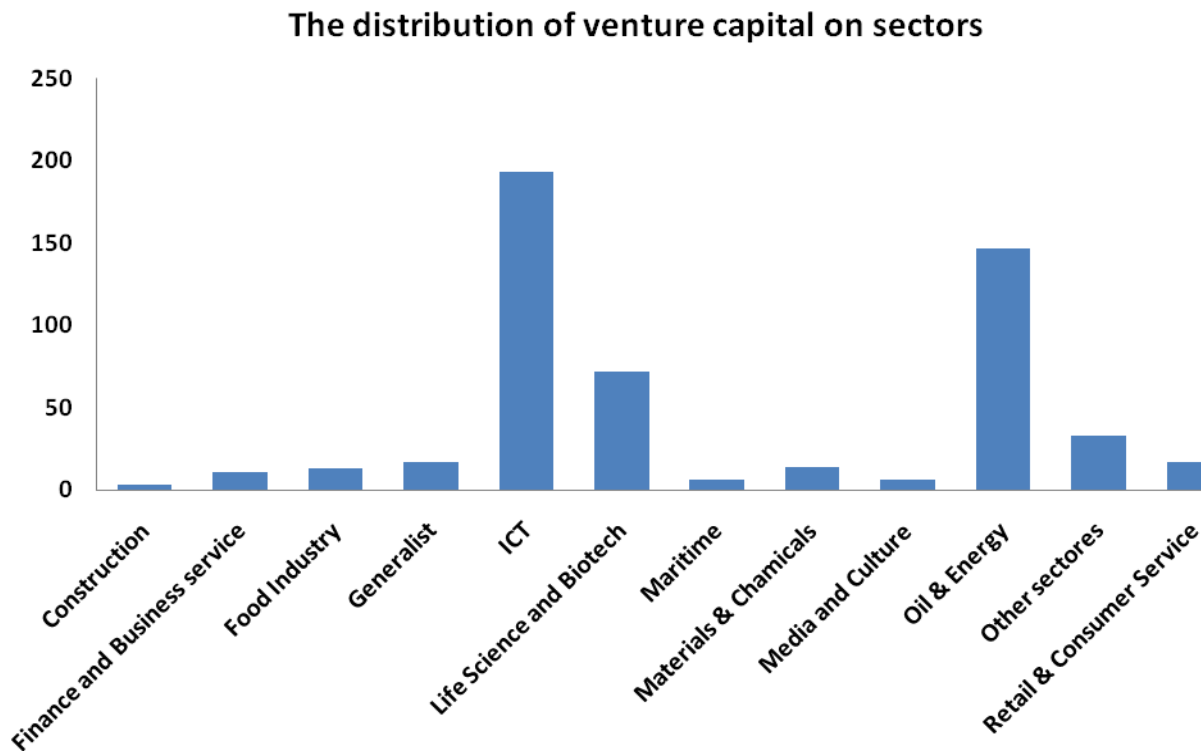


Figure 10: Source: NVCA

During the last years, the importance of active ownership has been highlighted. VC firms are good examples of such owners. They have, as said, different types of special knowledge which adds value to the company when used properly. Hence, venture capital is not just a last way out for a company in need of cash, but also a possibility to ensure the best possible development of the company. In many cases it is more profitable for the entrepreneur to share a big company with the VC firm, than to own a small company by himself. A small bite of a big pie could be larger than a big bite of a small pie.

Although the amount of capital committed to VC has increased during the last years, there is still an unsatisfied demand for more capital in the market. For each company the VC investors decide to invest in, they reject a huge number in a thorough screening process. It is not thereby said that all of these are companies with enough potential to attract capital in a larger market, but some would certainly be found investment worthy if the investors had more cash available.

3. Theory presentation

In the broad specter of venture capital theories, several views on optimal financial contracts have been proclaimed. Some argue that the same mechanisms (e.g. convertible securities) allocate both necessary cash flow rights and control rights (Marx (1998) and Berglöf (1994) amongst others). However, Gompers (1997) and Hellmann (1998) claim that the allocation of cash flow rights can be separated from the use of control rights by the use of covenants. We have chosen to structure our theoretical approach based on this perspective.

The cash flow rights are distributed based on an ex ante knowledge of the possible future scenarios. The question answered by the cash flow rights is “what should be divided and how it should be divided between the shareholders”. Control rights on the other hand, are included in the contracts to distribute the authority to make decisions in the possible scenarios which cannot be predicted ex ante. They do not answer the question “which action should be taken”, but describes “who shall decide which action to take”.

This structure allows us to separately analyze each group of mechanisms and thereby providing a clearer picture of their influence in the principal-agent problem, a central issue in the theory of venture capital financing. Although we have chosen to separate the two types of rights, an important feature of venture capital contracts is the complement of their respective effects. The correct combination of cash flow and control rights is crucial in order to design a well functioning contract.

In order to clarify the theory presented, we have included an imaginary case example which is presented in box 1 to box 5.

3.1 Cash flow rights

The most analysed and debated issue in venture capital contracting theory is the double-sided moral hazard problem between the entrepreneurs and venture capitalists. In the different stages of the contracting relationship various incentive problems arise. In order to maximize the total payoff, both parties have to exert a certain amount of managerial effort, which is dependent on the individual share of the total proceeds. Hence, cash flow rights play a crucial role in the structuring of an optimal contract. The cash flow rights are determined by the financial structure of the start-up. It is important that the financial claims satisfy the different needs for incentives. First, we will discuss different approaches and findings related to the double-sided moral hazard problem and how it affects the structuring of optimal financial claims. Second, we will turn to the principal-agent relationship between the venture capitalist (principal) and the entrepreneur/manager (agent). In this relationship the issue of managerial remuneration is crucial. The discussion will be motivated by a comparison of pay-performance sensitivity between various remuneration factors. Finally, other important cash-flow related contractual mechanisms observed in venture capital contracts will be covered.

3.1.1 Optimal financial claims

The most common approach is that the entrepreneur is wealth constrained and thus requires not only advice but also external financing, Schmidt (2003), Repullo and Suarez (2003) among others. However, Casamatta (2003) does not use the assumption that the entrepreneur is initially wealth constrained, and analyse the trade off between outside financing and sufficient incentives for the entrepreneur. Casamatta rely on the assumption that the more efficient agent (i.e. the entrepreneur) would not ask the less efficient for advice unless the latter invests a proportion of his wealth into the business. However, the outside investment must not exceed a given level, because then the entrepreneur's part of the proceeds will be too small. Introducing the assumption of a wealth constrained entrepreneur (more or less aligned with the findings of Kaplan and Strömberg, 2003) forces the entrepreneur to accept a high level of outside financing. This implies that other strong incentives must be provided to the

entrepreneur. Casamatta's solution is to issue common shares to the entrepreneur and participating preferred shares¹ or convertible bonds to the venture capitalist.

Case example: Founding of TechNova AS

TechNova is a newly founded company within the ICT sector. Their aim is to launch a new communications service within the Norwegian market. However, this service is dependent upon a government concession. The founders of TechNova are all scientist currently employed at the University of Bergen. In the start-up process a research fund connected to the university contributed to the required funding.

	Number of ordinary shares	Cash invested
Founder	10	100
Research Fund	10	100
Total	20	200

After a while, TechNova sees the potential of commercialising their product ideas. In order to achieve that, they need more capital and business knowledge for further growth. But the founders are wealth constrained and inexperienced. TechNova addresses the venture capital market. The venture capitalist VentureCo finds TechNova interesting, and decides to invest effort and capital. The ownership structure of the company after the investment:

	Number of ordinary shares	Cash invested	Value of shares
Founder	10 A	100	500
Research Fund	10 A	100	500
VentureCo	20 B	1000	1000
Total	20 A + 20 B	1200	2000

The new issue consists of 20 B shares (B = preferred share with conversion right). The founders original A shares (A = common shares) are called "founders share", and are subject to certain restrictions.

Box 1

¹ Participating means a preferred share that in addition to preferred dividends also pays an additional dividend when common share dividends exceed a specified amount. NB! Casamatta does not use the name "participating".

Without debt claims the preferred shares are first in the pecking order of cash claims, hence the payoff profile equals a debt claim. Common shares are only valuable when business are good (to the right of the dashed line in figure 1 (a)), which induce the entrepreneur to work hard. Issuing different financial claims to the venture capitalist and the entrepreneur creates a deviation in optimal risk exposures between the two parties. The entrepreneur becomes the residual claimant, consequently seeking a higher risk profile (figure 1(b)). Only outcomes in the upper half of the probability distribution² are profitable for the entrepreneur. Hence, the entrepreneur prefers to increase the risk exposure (σ), which increases the probability for higher exit values in the right tail. In figure 11 it is assumed that maximum leverage is used, i.e. the face value of the debt claim equals expected exit value:

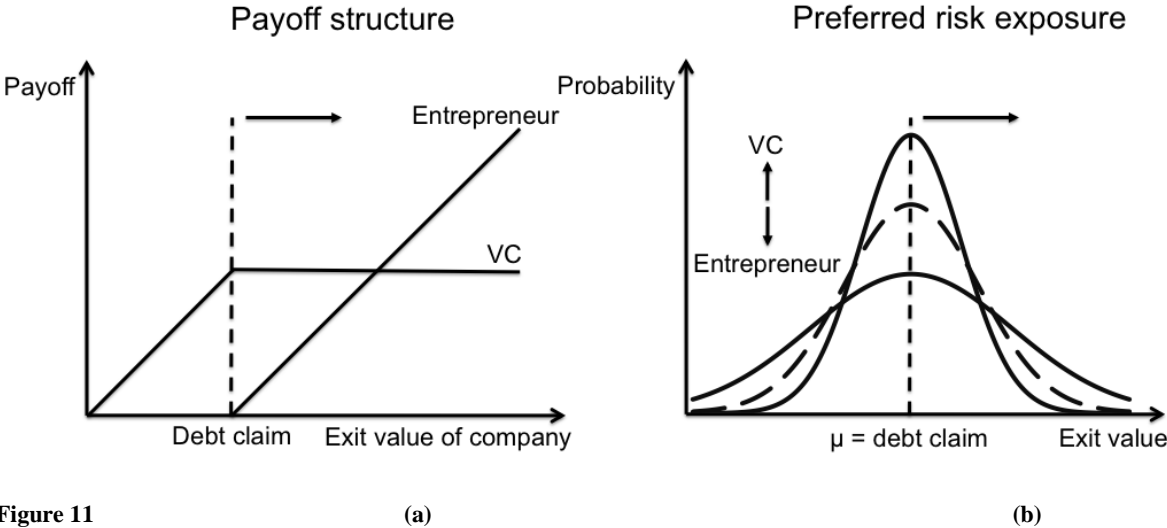


Figure 11

Green (1984) applies convertible securities to mitigate the problem of excessive risk taking. The idea is that a convertible security reduces the entrepreneur’s payoff for very good profit realizations and thus makes excessive risk taking less attractive (Schmidt, 2003, pp. 1141).

² Assumed normal distribution. Probability density function: $\frac{1}{\sigma\sqrt{2\pi}} \exp\left(-\frac{(x - \mu)^2}{2\sigma^2}\right)$

In the continuation of our discussion we will follow the analytical structure of Schmidt (2003) and Repullo and Suarez (2003). Both articles structure their analysis as a sequence of events. However, they differ somewhat in chronology and structure. We have to some extent merged the two models and outlined a new one (figure 12), which we believe is more aligned with empirical findings (Kaplan and Strömberg (2003) among others). More specifically, we have included the possibility of an expansion investment used in Repullo and Suarez (2003). But instead of allowing the entrepreneur and the venture capitalist to choose level of effort simultaneously, we have followed Schmidt (2003) and assumed that the entrepreneur provide his effort investment before he know to which extent the venture capitalist will contribute. In the next paragraph we will explain the model in full.

Sequential occurrence of events

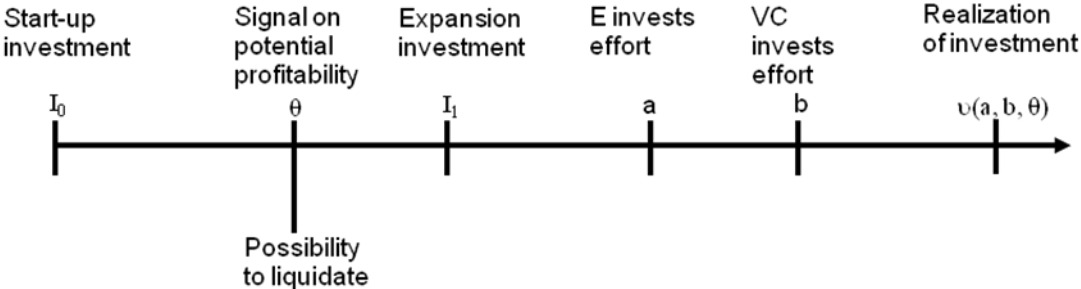


Figure 12

3.1.1.1 The model

Initially the venture requires a start-up investment (I_0), before a signal on potential future profitability occurs (θ). This signal can be verifiable, and thus incorporated as a contingency for the expansion investment (I_1). However, if the signal is not verifiable, the accumulated investment must be agreed upon in the initial contract. Examples on verifiable signals might be an approval of a drug or a new government concession. Non-verifiable signals are signals that are subject to manipulation or other uncertainties, e.g. entrepreneur/manager opinion or economic indicators. In this model we assume that the signal is verifiable. After the expansion investment both the entrepreneur (E) and the venture capitalist (VC) must choose their level of effort investment (a and b, measured by their costs). The efforts are regarded as complementary (a + b), hence, maximizing the expected total proceeds ($v(a, b, \theta)$) means that

both parties must exert a high level of effort. When choosing the level of effort, both the initial and the expansion investment are sunk and the parties are locked in by the mechanisms of the contract. We apply a theoretical model where an expansion investment is incorporated, because according to Kaplan and Strömberg (2003) the majority of venture capital investments in the US are divided into separate stages dependent on the achievement of milestones.

Following Schmidt (2003) we simplify the model and distinguish three signals on potential profit scenarios $\theta \in \{\underline{\theta}, \theta_m, \bar{\theta}\}, \underline{\theta} < \theta_m < \bar{\theta}$, and three corresponding actions of the venture capitalist $b \in \{b_c, b_0, b_s\}$. For each scenario the net total surplus is given by:

$$S(a(\theta), b(\theta), \theta) = v(a(\theta), b(\theta), \theta) - b(\theta) - a(\theta) \quad (1)$$

We define the first best efficient investment level which are assumed to be unique and given by:

$$\arg \max_{a,b} v(a,b,\theta) - b - a \quad (2)$$

We define the three possible states of the world in the same way as Schmidt (2003). $\theta = \bar{\theta}$ means that the expected value of the venture is in the range of a “high flyer”³ and the future prospects are very bright. In this case, the venture capitalist should follow up with an expansion investment and boost its effort in order to reap the maximum payoff. Action $b = b_s$ is chosen. If state $\theta = \theta_m$ occurs, the venture is expected to be a “living dead”³ and the venture capitalist should not spend more time and effort than needed in order to repay the claim from the initial investment, $b = b_0$ which we normalize to zero. Finally, if worst case scenario occurs $\theta = \underline{\theta}$, the most efficient choice for the venture capitalist is to exercise his control rights and liquidate the venture, i.e. $b = b_c$ where:

$$0 = b_0 < b_c < b_s$$

	State of the world:	Ex ante probability:
Good	$(\bar{\theta})$	p

³ Industry jargon.

Medium $(\underline{\theta}_m)$ q
 Bad $(\underline{\theta})$ $(1 - p - q)$

Where:

$$0 < p, q, (1 - p - q) < 1$$

Case example: The possible outcomes of TechNova’s future development

After the investment, the relationship between VentureCo and TechNova develops further, and VentureCo’s understanding of TechNova improves. The invested amount is used to develop the product idea and applying for the concession. At a point in time, the result from the application process is published. This can be interpreted as a verifiable signal of TechNova’s future profitability. The possible signals are:

	Signal	Outcome
θ	Concession approved	High flyer
θ_m	Sub-contractor to concession owner	Living dead
θ	Concession denied	Liquidation

If the concession is approved, it is possible to commercialise the product if they follow up with an additional expansion investment and both the founders and VentureCo contribute with their full effort potential . The founder’s effort is to transform the idea into a product and most important in the early phase. VentureCo’s effort is active participation in management decisions and use of their wide knowledge network, and is important in the commercialisation of the product.

If TechNova is not awarded the concession, but chosen to be sub-contractor, the concession owner can make use of their ideas in return of a fixed fee. An additional investment does not add value to TechNova. The transforming of the idea into a product is to a certain extent useful, hence the founders make an effort. However, the product is not going to be commercialised by TechNova, and VentureCo does not exert any effort.

If the concession is denied, VentureCo exercises it’s control rights and liquidates the company. VentureCo makes an effort in closing down TechNova.

Box 2

If the bad state occurs E cannot be forced to pay more than \underline{v} , due to the crucial and quite realistic assumption that he is protected by limited liability. In order to attract venture capital financing the total surplus from the venture must be sufficient to cover the debt claim from

the venture capital investor. The surplus if the good signal occurs (expected to be a “high flyer”) is unknown, however, recall that a “living dead” will repay the debt claim, something which implies that also a “high flyer” will. For a given investment level the face value of the debt claim (D) must fulfil the equation $I_0 = D(p + q) + (1-p-q)\underline{v}$ in a competitive equilibrium. Rearranging the equation and finding an expression for D (right side in inequality (3)). We end up with the following financing constraint:

$$S(a^*(\theta_m), b^*(\theta_m), \theta_m) = v(a^*(\theta_m), b_0, \theta_m) - a^*(\theta_m) - b_0 > \left(\frac{I_0 - \underline{v}}{p + q} + \underline{v} \right) \quad (3)$$

Note that the initial financing decision is only dependent on the start-up investment (I_0) and not the size of the expansion investment (I_1). Because when the decision point of the expansion investment is reached the VC has already verified the signal (θ), and therefore know whether the follow up investment would be profitable or not.

Other important assumptions are that a and b_s are complements at the margin. From this follows that the marginal surplus with respect to a , increases if the venture capitalist chooses effort b_s instead of b_0 . However, in the bad state a and b_c are substitutes at the margin and a change from $b \in \{b_0, b_s\}$ to b_c reduces the marginal surplus, with respect to a , to zero. This implies:

$$0 < a^*(\theta_m) < a^*(\bar{\theta})$$

3.1.1.2 Introducing convertible securities

The purpose of this analysis is to show that a convertible security (C, K, α) with the right features implements the efficient investment choices. A convertible security is more flexible than a straight debt or equity claim. Because the VC can make a choice at a date t , specified in the initial contract, based on the state of the world. He can either choose to be repaid K and receive α per cent of the equity in the venture, or receive a payoff equal to a fixed amount $C + K$. K can be interpreted as other debt claims without conversion rights. Recall that at good signal will trigger an expansion investment, and to reap the benefits of the “high flyer” upside VC will choose to convert. E and VC payoffs are given by:

$$R^E = \begin{cases} v(a, b, \theta) - (C + K) - a & \text{if VC does not convert} \\ ((1 - \alpha)v(a, b, \theta) - K - a & \text{if VC converts} \end{cases} \quad (4)$$

$$R^{VC} = \begin{cases} ((C + K) - b - I_0 & \text{if VC does not convert} \\ (\alpha v(a, b, \theta) + K - b - I_0 - I_1 & \text{if VC converts} \end{cases} \quad (5)$$

In order to get an understanding of the factors included in the convertible security (C, K, α) we will relate them to the financing constraint (3) previously explained, and formulate a financing constraint applicable for the convertible security:

First, the face value of the debt claim:

Debt claim:

$$C = \frac{(I_0 - \underline{v})}{(p + q)} + \underline{v}$$

(6)

Optionally converted into α percent of the equity at a date t :

$$\alpha v(\alpha^*(\bar{\theta}), b_s, \bar{\theta}) = (C + b_s)$$

Where α is:

$$\alpha = \frac{(C + b_s)}{v(\alpha^*(\bar{\theta}), b_s, \bar{\theta})} < 1$$

(7)

It would never be optimal to let the VC gain control of the entire post conversion equity ($\alpha < 1$). To see why, recall the discussion regarding the most efficient effort in the different states of the world:

Substitute (6) in (7) and presenting it as an inequality:

$$v(\alpha^*(\bar{\theta}), b_s, \bar{\theta}) - b_s > \frac{(I_0 - \underline{v})}{(p + q)} + \underline{v}$$

Must be satisfied because:

$$\begin{aligned} v(\alpha^*(\bar{\theta}), b_s, \bar{\theta}) - b_s &> v(\alpha^*(\bar{\theta}), b_0, \bar{\theta}) \\ &> v(\alpha^*(\theta_m), b_0, \theta_m) \\ &> v(\alpha^*(\theta_m), b_0, \theta_m) - \alpha^*(\theta_m) - b_0 \end{aligned} \quad (\text{I})$$

$$> \frac{(I_0 - \underline{v})}{(p + q)} + \underline{v} \quad (\text{II})$$

It is not optimal that the VC converts the debt claim in the medium state.

Because I is strictly larger than II, α has to be strictly smaller than one. If not, the VC will choose to convert.

$$\rightarrow \alpha < 1$$

A post conversion equity ownership less than 100 per cent ($\alpha < 1$) is consistent with the empirical findings of Kaplan and Strömberg (2003).

Second, K represents, as already mentioned, other non-convertible debt claims and must also be incorporated in the financing constraint. Based on (3) the financing constraint applicable for the convertible security (C, K, α) is:

$$S(\alpha^*(\theta_m), b^*(\theta_m), \theta_m) \geq C + K \geq 0 \quad (8)$$

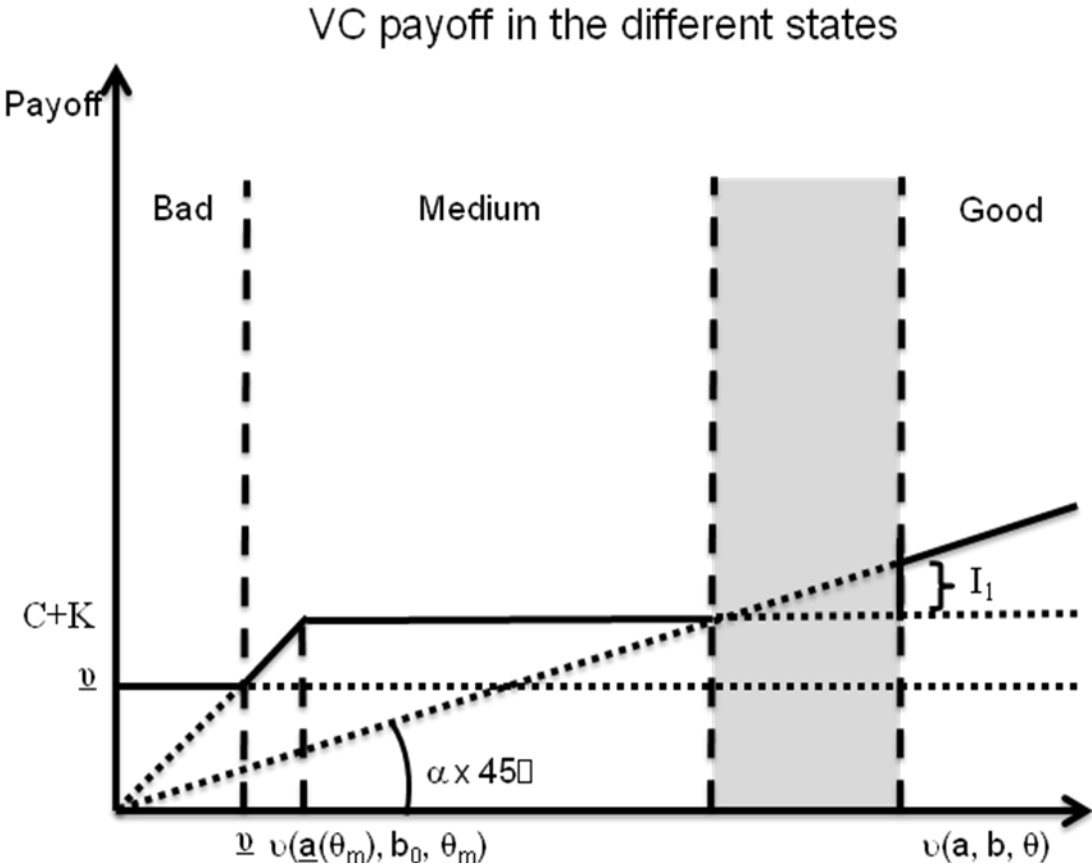
3.1.1.3 Mechanisms of the convertible security

In order to see the mechanisms of the convertible security (C, K, α) we will in the following paragraph go through the outcomes of the different states.

In the bad state ($\underline{\theta}$):

$$C + K = \frac{(I_0 - \underline{v})}{(p + q)} + \underline{v} + K > \underline{v} \quad (9)$$

This implies that the VC does not follow up with the expansion investment, because E will never be able to repay the initial debt (total surplus is strictly smaller than $C + K$). Hence, E chooses $a = 0$, which is the efficient choice. By not exercising the conversion option the VC will hold a debt claim and thus get all the returns of the project (because the value of the venture would not exceed the debt claim, see figure 3). Moreover, his efficient choice is liquidation (b_c) with a payoff \underline{v} .



Note: The grey shaded area is an intermediary state, which is not possible in the model. According to the assumptions the surplus in a good state will always cover the expansion investment cost. However, this is not too far from the real world, because a venture tends to either be a success or a complete fiasco.

Figure 13

If the medium state occurs (θ_m), the VC will choose not to convert if (recall payoff function (5)):

$$\alpha v(a, b, \theta_m) + K - b - I < (C + K) - b - I \tag{10}$$

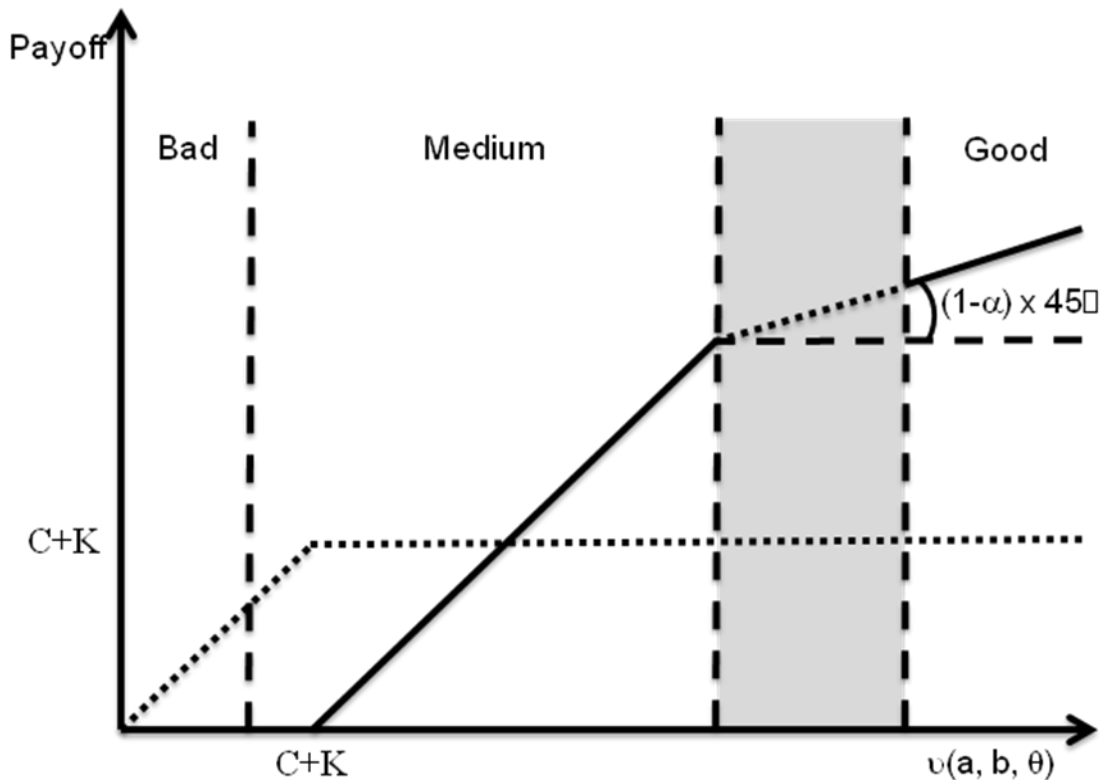
For a given effort $\underline{a}(\theta_m)$ the total realization of the investment $v(\underline{a}(\theta_m), b_0, \theta_m)$ will equal $(C + K)$ (see figure 3). According to (3) and (8), $\underline{a}(\theta_m)$ is strictly smaller than $a^*(\theta_m)$. Hence, there are three possible scenarios. Recall that it is efficient for the VC to exert effort b_0 in the medium state of the world.

i) E can choose $a < \underline{a}(\theta_m)$ and thus not be able to repay his debt. Furthermore, the VC should not exercise his option to convert.

ii) Effort $\underline{a}(\theta_m) \leq a \leq a^*(\theta_m)$. E can cover the debt claim, however, $\alpha v(a, b_0, \theta_m) + K - I < (C + K) - I$. And it is not efficient for the VC to convert the debt claim into a share α of the equity. Illustrated in figure 3; the dotted VC equity share line is below the debt claim line for all values of $v(a, b, \theta)$ in the medium state.

iii) $a > a^*(\theta_m)$, this option reduces the total surplus (recall the maximization definition (2)) while the VC's claim still equals $(C + K)$ (figure 4 illustrates E's payoff). Hence, this level of effort will never be optimal.

E payoff in the different states



Note: The grey shaded area is an intermediary state, which is not possible in the model. According to the assumptions the surplus in a good state will always cover the expansion investment cost. However, this is not too far from the real world, because a venture tends to either be a success or a complete fiasco.

Figure 14

In the good state ($\bar{\theta}$) a debt contract would not induce the VC to invest b_s , because his payoff will still be $(C + K)$. However, an opportunity to convert C into a share α of the equity would induce the right incentives if the conversion option is profitable. The VC will exert b_s if (from payoff function (5)):

$$R^{VC}(b_s) \geq R^{VC}(b_0)$$

If VC converts:

$$\alpha v(a, b, \bar{\theta}) - b_s + K - I \geq \alpha v(a, b_0, \bar{\theta}) + K - I \tag{11}$$

Note that in the good state, I includes both initial and follow up investment ($I = I_0 + I_1$), hence not the same value as in the bad and medium state. However, this will not affect the outcome of the model.

Assume that E exert $a \geq a^*(\bar{\theta})$ and substitute (7) into the payoff function (5):

$$\frac{(C + b_s)}{v(a^*(\bar{\theta}), b_s, \bar{\theta})} v(a^*(\bar{\theta}), b_s, \bar{\theta}) - b_s + k - I = C + K - I \quad (12)$$

→ By choosing b_s and converting, the payoff will at a minimum equal the debt claim less an effort b_0 (normalized to zero), for $a \geq a^*(\bar{\theta})$.

But this does not fully explain why (11) should hold, only the fact that VC will prefer to convert. In order to induce VC to exert a high level of effort, α must be sufficiently large to make it worthwhile to exert b_s . VC's part of the post-conversion equity (α) must exceed:

$$\alpha \geq \frac{b_s}{[v(a^*(\bar{\theta}), b_s, \bar{\theta}) - v(a^*(\bar{\theta}), b_0, \bar{\theta})]} \quad (13)$$

But is it rational to assume that E will choose $a \geq a^*(\bar{\theta})$?

From equation (12) we derive the logic that an effort $a < a^*(\bar{\theta})$ prevents the VC from converting, because then the converted payoff will be less than the debt claim. Furthermore, exerting b_s is not an optimal choice. However, this is not an efficient outcome. If they are willing to renegotiate the terms of the initial contract, a better solution for both parties can be achieved. E will never, as stated earlier, choose a level of effort below $\underline{a}(\bar{\theta})$ where

$v(\underline{a}(\bar{\theta}), b_0, \bar{\theta}) = C + K$ (see figure 14, a $v(a, b, \theta)$ below $(C + K)$ will leave no payoff for E).

And the venture capitalist will by no means accept a new contract with a return less than $C +$

$K - I \cdot \lambda$ is E's part of the renegotiation surplus ($v(a, b_s, \bar{\theta}) - b_s - v(a, b_0, \bar{\theta})$). E's payoff after renegotiation (based on (4))⁴:

$$\begin{aligned}
 R^E(a|\bar{\theta}) &= v(a, b_0, \bar{\theta}) - C - K - a + \lambda[v(a, b_s, \bar{\theta}) - b_s - v(a, b_0, \bar{\theta})] \\
 &< v(a^*(\bar{\theta}), b_s, \bar{\theta}) - b_s - a^*(\bar{\theta}) - [C + K] = R^E(a^*(\bar{\theta})|\bar{\theta})
 \end{aligned} \tag{14}$$

The explanation of this inequality is that if the entrepreneur's effort is less than $a^*(\bar{\theta})$ but higher than $\underline{a}(\bar{\theta})$, the total surplus becomes smaller while the return to the venture capitalist does not decrease, hence not an optimal alternative.

⁴ Schmidt (2003), pp. 1164, includes intermediary calculations.

Case example: Realisation of the results

We assume that TechNova was awarded the government concession, and the follow up investment was made. After the follow up investment (the issuing of 20 new B shares), the ownership structure of TechNova looked like this:

	Number of ordinary shares	Cash invested	Value of shares
Founder	10 A	100	500
Research Fund	10 A	100	500
VentureCo	40 B	2000	2000
Total	20 A + 40 B	2200	3000

After five years TechNova has grown considerably, and is in need of additional funding and a different corporate structure. VentureCo and the initial founders decide to list TechNova on the Oslo Stock Exchange. According to the contract this is a qualified IPO which is considered a deemed liquidation (for explanation, see glossary). The deemed liquidation triggers a conversion of B shares into common shares. Before the conversion, the B shares receive their preferred amount which in this contract is equal to the invested amount. The total proceeds from the IPO is 14 000. Exemplified below:

	Percentage shareholding	Preferred amount	Proceed from common shares	Total payoff
Founder	1/6	0	2000	2000
Research Fund	1/6	0	2000	2000
VentureCo	2/3	2000	8000	10000
Total	1	2000	12000	14000

Box 3

3.1.1.4 Summing up

A convertible security with the following features will provide a first best solution in all states of the world: α is chosen such that the VC is compensated for investing b_s and that the option is profitable only if E invests at least $\alpha^*(\bar{\theta})$. However, changing the chronology of the effort investments, e.g. the entrepreneur and the VC invest their effort simultaneously, a convertible security will no longer implement the first best investment incentives, even though it still

dominates standard debt-equity contracts. Nevertheless, relating this to the real world, an assumption that E's effort is invested previous to the VC's effort investment is not too far fetched. Because E often has the strongest impact on the venture in early stages and VC may be more important at the expansion stage.

3.1.2 Window dressing

The expansion investment is dependent on the "potential profitability signal" (recall figure 12). And the venture capitalist may choose to liquidate or not exert a high level of effort if he receives a low or medium profitability signal. This option induces the entrepreneur to manipulate the distribution of the signal before it is realized, in order to increase the probability of a positive signal. Manipulating the signal does not mean that the actual quality of the project is improved, hence, this change constitute a conflict of interest between the entrepreneur and the VC. This phenomenon is called "window dressing".

Window dressing is in general a value reducing activity. By staging the investments the entrepreneur is induced to focus on short-term objectives instead of providing the VC with quality information for optimal long-term investments. Hence, the conflict of interest is based on the future actions of the entrepreneur. In some cases this can prevent profitable projects from being financed altogether. Many articles discuss this issue, e.g. Green (1984) concludes that a mix of convertible securities and debt is superior to straight debt when it comes to mitigating the problem of the entrepreneur engaging in excessive risk taking. Aghion et al. (1994) focus on debt and equity claims with renegotiation, and show that a pre-specified bargaining procedure spurs an efficient outcome. However, none of these explain the use of convertible securities combined with stage financing which, according to Kaplan and Strömberg (2003), are so common in venture capital financing. To cover the phenomenon of "window dressing" we have chosen to follow Cornelli and Yosha (2003)⁵.

Suppose that between the start-up investment and the realization of signal θ the entrepreneur has an opportunity to affect the signal distribution. By increasing the probability of observing $\bar{\theta}$ and reducing the probability of observing $\underline{\theta}$ without actually affecting the probability of a

⁵ The notation and the model are transformed into the same format applied in figure 12. Hence, it deviates from Cornelli and Yosha (2003).

high value outcome ($v(a, b, \theta)$), the entrepreneur may convince the VC not to apply its control-rights and liquidate the venture in the short-term. From the VC's point of view, window dressing should be prevented by all means, because the liquidation/refinancing decision is thus based on lower quality information. And distorted information will reduce the value of the VC's option to abandon the venture⁶. Furthermore, in order to mitigate the window dressing problem, the mechanisms used in the financing contract should ensure appropriate cash flow rights in each state of the world. Cornelli and Yosha (2003) prove that there is a convertible security (C, K, α, γ) with these features. By constructing a convertible security such that in equilibrium the VC (Cornelli and Yosha (2003), pp. 14);

- provides I_0
- liquidates the project after observing $\theta \leq \underline{\theta}$, but not otherwise
- does not convert any debt after observing $\theta \in (\underline{\theta}, \bar{\theta})$
- converts the maximal amount of debt allowed (C) after observing $\theta \geq \bar{\theta}$

Recall that this is a convertible security with the same mechanisms as the one presented in the “Optimal financial claims” introduction paragraph. In addition, Cornelli and Yosha (2003) introduce an extra factor γ , which is important in this setting. The conversion ratio γ combined with α play a key role in the construction of the contract. A suitable conversion ratio must be chosen to provide the VC with the right incentives. Low values of γ imply that converting the debt claim into equity is relatively cheap and for high values, the VC will not convert, because it is relatively expensive. Whether the conversion ratio is considered low or high, depends on the level of α . Increasing α means reducing the entrepreneur's share of the post conversion equity and the incentive to window dress becomes lower. Hence, the combination (γ, α) will still be effective even for a higher γ . The entrepreneur will not pursue window dressing if he knows that it will prompt conversion and cause a loss that cannot offset the advantage from the fact that liquidation is less likely to take place.

⁶ The option to liquidate equals a put option, and inaccurate information regarding the underlying asset reduces the value of the option.

3.1.3 Managerial remuneration

In the principal-agent relationship between the venture capitalist (principal) and the entrepreneur/manager (agent) the issue of managerial remuneration is crucial. In the following section we will focus on the remuneration “package” offered to entrepreneurs/managers and discuss the effects on incentives.

3.1.3.1 Pay-performance sensitivity

So far we have discussed the use of cash-flow rights as a measure to achieve efficient investment and managerial incentives. And it is almost regarded as a truism that higher levels of equity and cash are equal to better incentives. But the degree of incentives generated by various cash and equity claims depend on which measure is used, and even more importantly, which measure is believed to be correct. Baker and Gompers (1999) have analysed the CEO equity ownership and its implications, for both venture capital-backed and nonventure capital-backed pre-IPO firms. Interestingly, in their sample⁷ venture capital-backing reduce CEO equity ownership from an average of 35 per cent to 19 per cent. At a first glance these results might seem a bit peculiar, since VCs are known to pay considerable attention to managerial incentives. However, as mentioned earlier, it depends on how the levels of incentives are measured. So instead of just increasing the cash payout and the equity holding, the focus should also be directed towards the so-called pay-performance sensitivity of the remuneration factor. Pay-performance sensitivity is typically defined as the change in CEO wealth associated with a one per cent change in shareholder wealth (elasticity). Thus, it is important to look at both measures because low equity ownership in percentage terms does not necessarily mean low incentives.

In general, there are four main sources of CEO remuneration: Equity holdings after IPO (e), options (o), salary (s) and shares sold (sa). Each remuneration factor differs in their pay-performance sensitivity (η_i , $i \in \{e, o, s, sa\}$). So in order to calculate the total pay-performance sensitivity (or elasticity⁸) (η) of an incentive “package” the weighted average is used. And the weights are the fraction of total CEO remuneration that each factor represents⁹.

⁷ Initial sample 1,553 firms (1,120 nonventure capital-backed and 433 venture capital-backed) that went public between 1978 and 1987. This is arguably an old sample. After elimination; 1,011 firms were used in the analysis.

⁸ $\eta_{x,y} \cong (\text{per cent change in } x / \text{per cent change in } y)$

⁹ The notation follows Baker and Gompers (1999)

$$\eta = \frac{E^{CEO}}{W^{CEO}} \eta_e + \frac{O^{CEO}}{W^{CEO}} \eta_o + \frac{S^{CEO}}{W^{CEO}} \eta_s \quad (15)$$

CEO pay from sales of shares is not included in the weighted average equation because $\eta_{sa}=0$. The least sensitive factor of the remaining is salary. η_s is difficult to estimate and affected by many variables, nevertheless, we approximate it to be close to 0.1¹⁰. This number is not very precise, however, it is considerably lower than the other elasticities in equation (15). The elasticity of equity holdings (η_e) equals 1.0, obviously because increased share price equally affects the equity holding of the management (the entrepreneur) and the other owners (VC etc.). When it comes to options the issue is more complex. Based on the option delta (Δ)¹¹, the Black-Scholes value of the call option (c) and the share price (P) the option elasticity is computed as follows:

$$\eta_o = \Delta \frac{P}{c} \quad (16)$$

The option elasticity is typically greater than 1.0, thus, measured by pay-performance sensitivity this remuneration factor yields the most high-powered incentives. In fact, there are also several other dimensions that affect the delta. In risk management it is common to talk about the “Greeks”¹² (delta is one of them), however most of them are outside the scope of this discussion. But we will briefly include the vega (price sensitivity to change in volatility), or more precisely how the volatility (σ) of the share price affects the delta. This measure is called the vanna¹³ and can be interpreted as the sensitivity of delta to a unit change in volatility. For a call option the vanna is strictly positive, which imply that the pay-performance sensitivity for call options in high-risk companies will be greater than for low-risk companies.

Relating this discussion to the venture capital industry, it would be intuitive to believe that options are widely used in managerial (or entrepreneurial) incentive “packages”. Hereunder, the risk exposure and lack of liquidity to fund extensive salary payouts in start-ups. Options

¹⁰ Reported in past studies of large firms, Baker and Gompers (1999), pp.16

¹¹ Delta (Δ) measures the sensitivity to changes in the price of the underlying asset. $\Delta = \frac{\partial c}{\partial P}$

¹² “Greeks” is a collective term used for the parameters representing the market sensitivities of derivatives.

¹³ Vanna = $\frac{\partial^2 c}{\partial P \partial \sigma}$, Wystup (2006). However, the “Greek” name vanna is not widely used for this parameter.

would be a “cheap” way of providing sufficient pay-performance sensitivity. This intuition is somewhat aligned with the findings of Baker and Gompers (1999). They find that options are a slightly higher fraction of total CEO remuneration in venture capital-backed than in nonventure capital-backed companies. However, for both samples the percentage is quite low and not significantly affecting the total pay-performance sensitivity. Directing the attention towards the total pay-performance sensitivity, venture capital-backed CEOs have moderately more sensitive pay, although the differences are not significant. Solely based on a risk perspective, these findings somewhat contradicts the view of most principal-agent models. E.g. Aggarwal and Samwick (1999) conclude that the pay-performance sensitivity of a manager’s compensation is decreasing in the variance of company return. This is most likely a result of principals (investors) not wanting the agents (managers) to take on unnecessary risk exposure. However, Aggarwal and Samwick (and most principal-agent models) used a sample of large public traded corporations, and it is important not to “compare apples with pears”. In the VC industry other parameters prevail. To our knowledge no empirical analysis is conducted on this issue within the VC industry.

Designing the perfect incentive “package” one should in theory also incorporate dimensions such as implicit incentives, company specific factors (size, industry etc.) and control rights. We would not dig deeper into the implicit incentive dimension than just reporting the findings of Gibbons and Murphy (1992). They report that measured by the sensitivity of CEO wealth to shareholder wealth, incentives are increasing in CEO age, but unrelated to equity ownership. Control rights and their relationship to cash flow rights, and hence incentives, are extensively covered in the next chapters.

3.1.4 Other CF related contractual mechanisms

3.1.4.1 Automatic conversion

A possible add-on to the debt conversion right is automatic conversion. Automatic conversion is applicable when the signal on interim performance is verifiable. Hence, the conversion can be exercised when a pre-specified milestone has been achieved. If the signal is not verifiable it will be impossible to relate the automatic conversion to a contingency and it will not prevent the entrepreneur from window dressing. By instead giving the VC an option to convert, the debt-equity structure will also be flexible to new unexpected information, a

feature that is necessary to prevent window dressing in incomplete contracts environments. An interesting finding by Kaplan and Strömberg (2003) is that a large percentage of the VCs in their sample use both automatic conversion and conversion options contemporaneously. The automatic conversion clause is usually linked to well-defined verifiable signals, such as an IPO. While interim performance signals do not seem to be considered verifiable enough, hence the use of conversion options with the right to convert during the lifetime of the project. So why is automatic conversion provisions widely applied? It seems that it is an efficient way to prevent major debt overhang and hold-up problems by early investors. An automatic conversion provision in a way withdraws the seniority rights of early investors, thus, opens up for new capital investments. Verifiable milestones such as IPOs often spur structural changes and make the company appealing to new types of investors. And in order to attract these new groups of investors efficient redemption of old claims is necessary.

3.1.4.2 Anti-dilution provisions

Anti-dilution provisions are important mechanisms for investors to protect the value and influence of their investments. They protect against subsequent offerings at lower prices, as well as adverse changes in corporate structure. Many venture capitalists view anti-dilution provisions as a necessity for them in order to provide sufficient investments, however, from the perspective of the entrepreneurs such provisions are often viewed as unfair and an obstacle for subsequent investors. There is no logic that favours one side, because both are more or less right in their proclaimed views. Consequently, this conflict of interest is often intensely debated and the outcome tends to depend on the bargaining power of the different parties. This “give and take” process has resulted in various degrees of anti-dilution provisions being applied. But in general there are two main variants; full ratchet and weighted average.

A full ratchet provision fully compensates the investor if there are subsequent down rounds. The conversion price for the initially invested convertible preferred shares is ratcheted down to the lowest price at which new shares are being issued. For example, if the next round of financing is for a price that is half of the first round price, the conversion price of the original preferred will be cut in half so that the original preferred investors will receive twice as many common shares upon conversion (Marino, 2005, pp. 2).

A weighted average ratchet provision will, if a down round occurs, only partly compensate the initial investor. In this case the conversion price of the initially issued preferred shares is set equal to the weighted average of conversion price prior to new issuance and price per share of new issue. Summarised in the following formula¹⁴:

$$x = \frac{x^1 y^1 + x^2 y^2}{y^1 + y^2}$$

x = applicable conversion price following new issuance.

x^1 = applicable conversion price prior to new issuance

y^1 = number of shares of common share outstanding prior to new issuance.

y^2 = number of additional shares of common share issued in new issue.

x^2 = price per share of new issue.

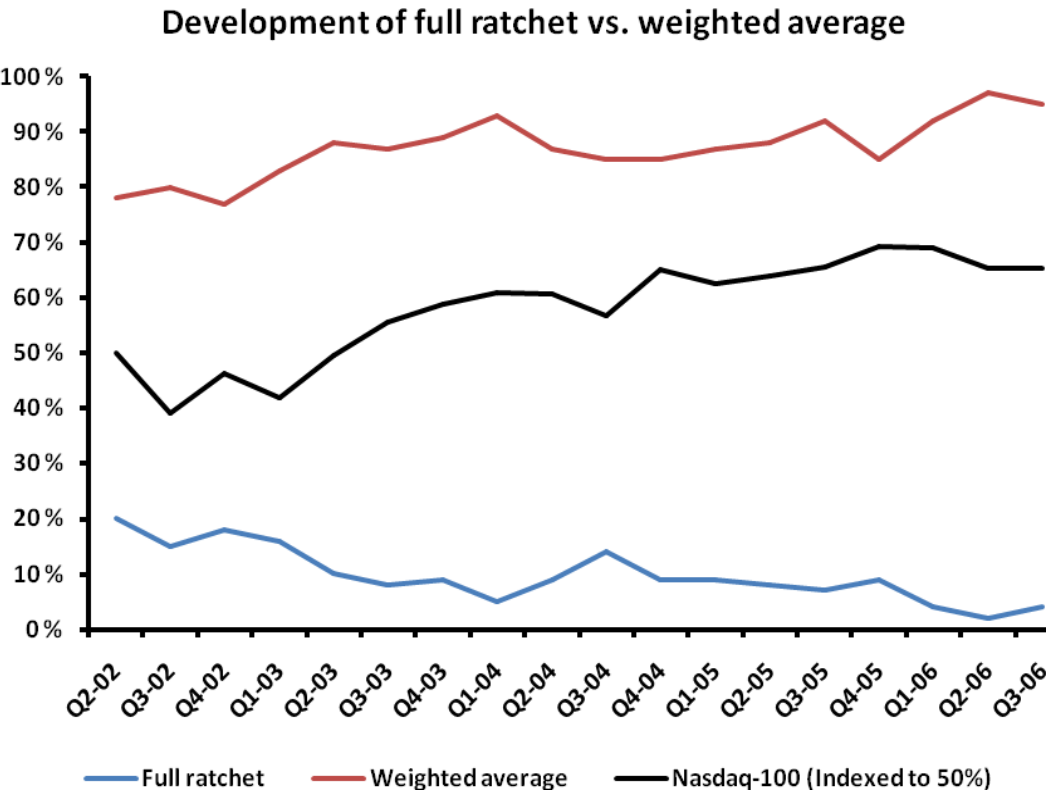
Two subtypes of the weighted average ratchet provision is narrow-based and broad-based ratchet. The difference is in the interpretation of y^1 . A narrow-based ratchet provision incorporates only common shares outstanding, however, the broad-based incorporates also all convertible securities, warrants and options.

From the explanation above it is rational to expect the venture capitalist to push for a full ratchet provision, something, which the entrepreneur certainly will oppose because a full ratchet provision might be an obstacle when attracting other new investors if they do not receive the same provisions. But an even more hard-hitting argument is that a new offering will dilute the existing common shareholders, which often is the management team (or entrepreneur). Nevertheless, will it always be optimal for the venture capitalist to pursue this strategy? Recall the previous discussion regarding incentives in a venture-financing contract. In order to induce the entrepreneur to exert an optimal level of effort he must receive a part of the possible upside in the venture, i.e. own a sufficient fraction of the equity. This condition is not fulfilled if the dilution effect is too severe.

In the end, the respective parties bargaining power seem to determine the level of anti-dilution applied. According to Marino (2005) there are four dominant factors affecting the level of bargaining power; how desperate the company/issuer is for capital, the inexperience of the

¹⁴ Marino (2005) pp. 2

management team and its advisors, the inability of the company/issuer to attract capital and the current market environment. Arguably the most important of those four factors is the market environment. An interesting example is the use of full ratchet versus weighted average provisions in the San Francisco Bay Area from Q2 2002 to Q3 2006 (Fenwick and West, Q1 2004, Q3 2004, Q3 2006). Remember that Q2 2002 was the first quarter after the burst of the high-tech bubble and capital available for new venture investments plummeted. As a consequence, VC bargaining power increased. In the following years the economy picked up speed again, and as more and more money poured into the Californian high-tech venture industry the negotiating leverage shifted towards the issuer/entrepreneur. To illustrate the development we have used the Nasdaq-100 index (Yahoo!finance) as an economic trend benchmark and graphed it together with the percentage use of full ratchet and weighted average provisions over the respective period (figure 15). It is interesting to see that the use of full ratchet (weighted average) provisions decrease (increase) in correlation with the underlying market trend. The residual percentage is quite stable and represents the fragment of the sample where no anti-dilution provisions were used.



Source: Fenwick and West, Q1 2004, Q3 2004, Q3 2006 and Yahoo!finance

Figure 15

3.2 Control rights

An entrepreneur seeking capital is always facing the same problem; should he issue voting equity or debt? While equity reduces the influence and power of the entrepreneur over the company through dilution, debt increases the risk of bankruptcy which will lead to a loss of the entire firm.

The importance of control right distributing mechanisms is described by Kirilenko in his article from 2001: *“If it does not exist a mechanism to distribute control rights, then investment does not take place, information relevant to the project’s pay-off is not revealed and risks are not shifted from a risk-averse entrepreneur to a risk-neutral investor.”* This means that without the mechanisms distributing the control between entrepreneur and investor, there will be made no venture capital investments.

In this section, we will first look at the distribution of control rights with a modified version of Aghion and Bolton’s model from 1992. Then we will go on presenting and analyzing different types of control right mechanisms used in venture capital contracts.

3.2.1 Distribution of control rights

3.2.1.1 The model

For VC, there are alternatives to giving E the correct incentives at all times. One option is to allocate the control rights so that E has no choice other than to follow VC’s will. The model used to describe the control right allocation of different type of contracts is based on Aghion and Bolton’s article from 1992. We have made adjustments regarding several aspects of the model, to ensure that it is compatible with the model used to describe CF rights.

Utility: VC: Interested in monetary results, $U^{VC}(r, a) = r$

E: Interested in both monetary results and private benefit, $U^E(r, a) = r + l(a, S)$

r = final period return

a = action taken (Not to be confused with a in the previous model. Here the action a can be taken by both E and VC, and does not refer to E’s effort)

l = private benefit

The state of nature, S , is costly or impossible to observe. Hence it cannot be contracted upon. Ex post it is easy to identify. The signal θ on the other hand is publicly verifiable. As it is positively but imperfectly correlated with S , it can be used for contracting purposes. The monetary returns are all verifiable.

Assumptions

1. There are two states, $S \in \{S_g, S_b\}$

Aghion and Bolton (1992) are assuming only two possible states of nature, good and bad. To stay in line with the previous model, we fit the old assumption of three states into the new model. Initially, we are assuming that there are three possible states; good, medium and bad with three corresponding signals; $\bar{\theta}$, θ_m and $\underline{\theta}$. However, when working with control rights we can merge good and medium to be the state good, and let the new bad state correspond to the bad state used in the earlier model. The same applies to the corresponding signals.

To see how we can make these assumptions, let us have a closer look at the two states of Aghion and Bolton's model: In S_g , the VC has no desire to intervene with the management's running of the company. In relation to the previous model, this can be seen as letting the company live, which is VC's choice in state good and medium. As those two states here require the same action, they are merged into the same category.

In the bad state, the VC will choose to interfere. This interference has negative impacts on E, and can therefore be seen a parallel to liquidation, which is the VC's choice if the bad signal occurs

2. There are two actions, $a \in \{a_g, a_b\}$

$a_g = a^*(S_g)$, VC does not interfere; E decides which action to take.

$a_b = a^*(S_b)$, VC interferes and controls the choice of action.

The interference of VC can take several forms. It can be changes in management, organizational changes, new business plans etc. What they have in common is that they reduce the private benefit of E, hence E does not want VC to interfere.

3. There are two signals, $\theta \in \{0,1\}$

$\theta = 0$ is a signal of the bad state and $\theta = 1$ is a signal of good state.

We fit the old assumption of three signals ($\bar{\theta}, \theta_m$ and $\underline{\theta}$) into the new model with two signals the same way as we did with the states of nature. We merge good and medium into the new good signal, $\theta = 1 \in (\bar{\theta} \cup \theta_m)$ and set the new bad signal equal to the old bad signal, $\theta_0 = \underline{\theta}$.

$\beta^1 \theta = P(\theta = 1 | S)$ = the probability of the signal good given that we are in the good state

$$\beta^1 0 = P(\theta = 1 | S_{1g}) > 1/2$$

$$\beta^1 1 = P(\theta = 1 | S_{1b}) < 1/2 \quad (2\text{a})$$

This means that when there is a good signal, there is a greater probability of ending up in the good state, and vice versa when the signal is bad.

4. There are two final period results: $r \in \{0,1\}$

$$y_{ij}^r = E(r | S = S_{1i}, a = a_j) \equiv P(r = 1 | S = S_{1i}, a = a_j)$$

The probability of good result given state S^i and action a_j .

Private benefits: l_j^i is defined as private benefits in state S^i given action a_j



First best pair of actions (a_g, a_b)

$$y_g^g + l_g^g > y_b^g + l_b^g$$

$$y_b^b + l_b^b > y_g^b + l_g^b$$

When we have a good state of nature ($S=1$) the sum of monetary returns and private benefits is larger when the action chosen is to keep letting management run the company. On the other hand when the state is bad, the sum of monetary returns and private benefits is larger when VC interferes.

5. The financing constraint: $Gy_g^g + (1 - G)y_b^b > I_0$

G is defined as the probability of ending up in the good state. Corresponding to the previous model that gives: $G = p + q$

Figure 16 presents sequentially how the model works. First the investment I_0 is made. Then the players observe the signal θ , and based on the signal, and action a is taken. In the end the players observe which state they are really in, and the result is realized.

Sequential occurrence of investment process events

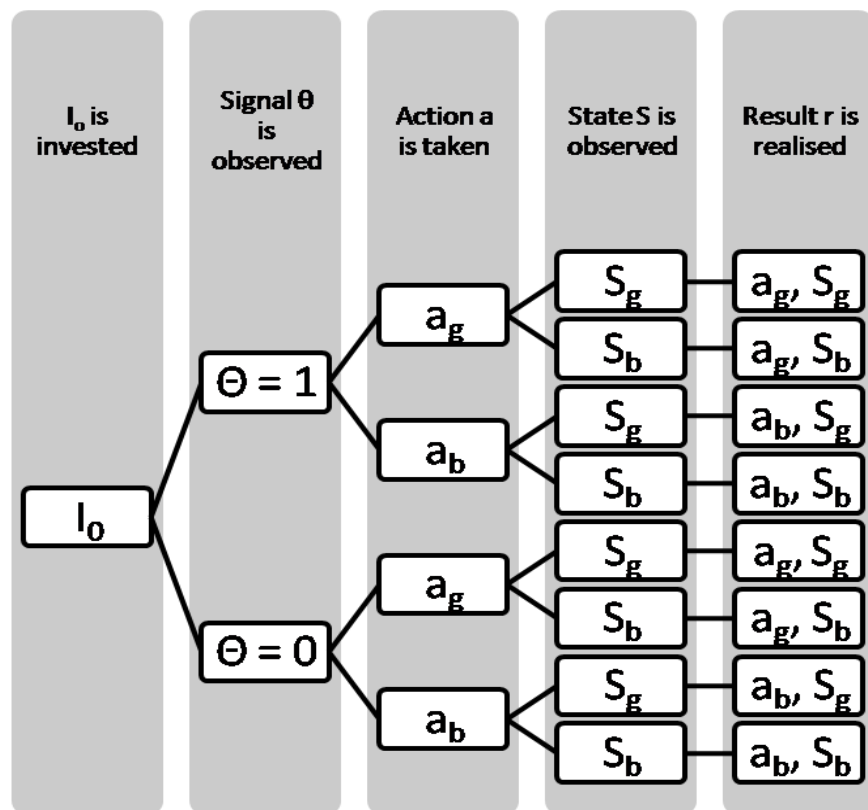


Figure 16

Ex ante contracts are incomplete. This opens up for renegotiation after experiencing the true state S. All the ex ante contracts have:

- I. Management compensations schedule.

The VC receives all the residual income, and E gets a transfer which is a function of the signal and realized returns: $t(s, r) \geq 0$

If the signal is verifiable, the transfer can be made contingent on the choice of action a: $t(a, s, r) \geq 0$

In the model used to describe the optimal financial claims, the manager is seen as the owner, not like here, as an employee. There is no transfer of wealth from VC to E. For our analysis, that does not matter. What we are interested in is how E and VC's wealth changes with state of nature and choice of action. The effect those two parameters have on payoff are the same in both models.

II. Control allocation rules.

The control rights can be individually or jointly distributed between the two parts. If the rights are individual, one part gets the exclusive right to decide which action to take.

If the rights are jointly distributed, we can describe them like this:

μ_S^{Player} is the probability that either E or VC gets the right to decide which action to take given state S when the control rights are joint.

$$(\mu_S^{VC}; \mu_S^{VC}) \in [0,1]^2 \text{ and } (\mu_S^E; \mu_S^E) \in [0,1]^2$$

Where $\mu_S^{VC} + \mu_S^E > 1$ for some S

If $\mu_S^{VC} + \mu_S^E = 1$, then one part has exclusive rights to exercise control and we are back to the case of individual rights.

When control rights are joint, we need simultaneous actions to avoid hold-ups. The process of renegotiation in such contracts goes like this: After realizing the state, S, E makes a "take it or leave it offer" to VC. If VC accepts, the action desired by E is taken. If the VC refuses E's offer, a hold-up (or stand still) will occur, reducing the final period profits to 0 ($r=0$).

We will now examine the distribution of control rights both when the actions are verifiable and when they are not.

3.2.1.2 When actions are not verifiable

When the actions are not verifiable, we basically have to different types of contracts, unilateral and contingent. The unilateral contracts have individually distributed control rights like described in the section above. The contingent contracts are made contingent on the signal θ .

We will look at three different scenarios to find out how the control rights should be allocated to maximize the chances of reaching a first best scenario.

When should E have control?

What about a situation where E has the control rights, and there are ex. post renegotiation?

Since there are only two final period results, 0 and 1 the transfer function will look like this:

$$t(\theta, r) = [t(\theta, 1) - t(\theta, 0)]r + t(\theta, 0) = t_{\theta}r + t'_{\theta}$$

E chooses his actions dependent on the signal to maximize his payoff:

$$a^E(\theta, S_i) = \max_{a_j \in a} \{t_{\theta S} y_j^i + t'_s + l_j^i\} \text{ where } i = (g, b) \text{ and } j = (g, b)$$

When $a^E(\theta, S_i)$ differs from the first best action $a^*(S_i)$, there might be room for renegotiation.

Assume that t_s and t' are such that without renegotiation, E's choices would be a_g when $\theta=1$ and a_b when $\theta=0$. If the signal says good ($\theta=1$) but we end up in a bad state (S_1^b) there is certainly scope for renegotiation.

Before the renegotiation the payoffs (R) of VC and E are as follows:

$$R^{VC} = y_g^b(1 - t_1) - t'_1$$

$$R^E = y_g^b t_1 + t'_1 + l_g^b$$

E offers the VC the same payoff as before, but his own payoff will rise to:

$$R^E = (y_b^b + l_b^b) - y_g^b(1 - t_1) + t_1'$$

And because of assumption 4: $y_b^b + l_b^b > y_g^b + l_g^b$, his new profit is higher than the old. E knows that VC will accept his offer, because VC's alternative is a hold-up which will give him a payoff equal to 0. This shows that when E has the control rights and there is an ex. post renegotiation, we will always end up with the first best action being taken.

But the problem here is that when a wealth constrained E has the control, the VC often does not get a high enough payoff. This means that the rationality constraint of the VC is broken, $Gy_g^g + (1 - G)y_b^b \neq I_0$, and the project will not be financed. Hence, entrepreneur-control might not be such a good alternative after all.

However, sometimes entrepreneur-control is a good thing. It is obvious that when E's private benefits are comonotonic with the total revenue ($l_g^g > l_b^g$ and $l_b^b > l_g^b$), control rights allocated to E will lead us to a first best scenario. But as the objectives are difficult to know, the utility function of E remains unknown, and the VC cannot verify whether E's objectives really are in line with his own.

But when the private benefits of E are not comonotonic with the total revenue (for example if $l_b^b < l_g^b$) the VC can no longer rely on E to take the first best action. To ensure that, E will have to be compensated, either through the transfer function or through renegotiation, enough to always want to choose the first best action in both states. The problem, however, is that the requirements of E are not possible to combine with the requirements of VC. In some cases there will not be enough proceeds to satisfy both parties.

When should VC have control?

Like with E, when the VC's incentives are perfectly in line with the total revenue (i.e. when monetary benefits are comonotonic with total revenue,

$y_1g^g > y_1b^g$ and $y_1b^b > y_1g^b$), VC-control ensures first best action being taken.

When monetary benefits are not comonotonic with total revenues, E's wealth constraints might prevent him from getting VC to choose the first best action. Suppose we are in a situation where $y_g^g < y_b^g$ and focus on contracts where $t_s' = 0$. In the state S_g , the VC will not choose a_g unless $t_s \geq 1$, because $(1 - t_s)y_g^g < (1 - t_s)y_b^g$. E must then offer VC a share of his monetary transfer that is high enough to compensate VC for the loss he suffers when switching to first best action a_g . So unless the original transfer share belonging to E is large, or the difference in monetary payoff between a_g and a_b is small, E's wealth restrictions keeps him from offering a Pareto-improving contract to VC. So, for VC-control to ensure the first best alternative, E cannot be subject to strict wealth restrictions, or VC's potential gain from deviating from first best action must be small.

When is contingent control the best option?

When neither E- nor VC-control ensures that first best action will be taken, it is possible to write a contract where E gets the control contingent on one signal and VC gets the control contingent on the other signal.

Assume that neither private nor monetary benefits are comonotonic with total benefits, $l_b^b < l_g^b$ and $y_g^g < y_b^g$. Then first best action will be taken under VC-control only in S_b and under E-control only in case of S_g . Since S is unobservable, we cannot contract upon it. What we can observe on the other hand, is the signal θ . If θ is more or less in correlation with S, the contract can be written so that VC achieves the control if $\theta=0$ and E if $\theta=1$. This will approximate, but not ensure (unless S and θ are perfectly correlated) first best action being taken.

In their article, Aghion and Bolton (1992) conclude that when neither monetary nor private benefits are comonotonic with total benefits, there are values of I_θ such that:

- E-control is not feasible
- VC-control is not first best efficient
- Both the unilateral control allocations are dominated by contingent control

Case example: Distributing the control rights when actions are not verifiable

Going back to the time of contract negotiations, when VentureCo and the founders of TechNova argued about the distribution of control rights, several issues were heavily debated.

The founders demanded shared control of the use of VentureCo's knowledge network. They argued that without a proper use of the network, the possibilities of realising the potential value of TechNova would be reduced. VentureCo did not agree to this and argued that their incentives were comonotonic with total profit: The only situation where the network adds value to TechNova is if they are awarded the concession. In that case both VentureCo and the founders profit from using the knowledge network to increase the value of TechNova, hence providing VentureCo with the unilateral right to decide whether or not to use the network, ensures the optimal outcome.

	Distribution of rights	Example
Comonotonic with total profit	Founders decide	Founder's effort in transforming idea to product
	VentureCo decides	Use of knowledge network
Non-comonotonic	Contingent control	The use of the idea

VentureCo wanted control over the use of the product idea. But the founders were afraid that increasing VentureCo's control would not prevent the venture capitalist from benefitting from the idea behind the founders' backs. For example by founding a start up, owned 100 per cent by VentureCo, using the same product idea to compete for the government concession. The reason for the founders worries was that misusing the product idea is a non verifiable action, which is not comonotonic with TechNova's total profit. VentureCo understood the founders worries and they agreed upon a contract where VentureCo was granted the control right over the use of the idea contingent upon the government concession. Once the concession is awarded, only TechNova can make use of it, and the product idea has limited value to others.

Box 4

3.2.1.3 When actions are verifiable

When the actions are verifiable, the initial contract can include how control rights should be transferred contingent on actions taken by E and VC. We can also write contracts which prohibit the execution of certain undesired actions. This way the VC can reduce E's negotiation power, and thereby not having to alter the contract later to avoid hold-ups.

Do we need a contract with restrictions when there are only two possible states? When the actions are verifiable, the monetary transfer from VC to E can also be contingent on the choice of action, $t(a, \theta, r) \geq 0$. When second period return has two values (0 and 1), we can write: $t(a, \theta, r) = t_{\theta a} r + t'_{\theta a}$

Assume further that private benefits are not comonotonic with total revenues, so that E-control is not dominating. Then we can assume that $t'_{\theta a} = 0$. We denote $t_{\theta g}$ ($t_{\theta b}$) E's share of the monetary returns when action a_g (a_b) is taken, and signal θ is realized.

Then we can compare the two contracts, restricted and contingent. The contract with a predetermined action plan directly specifies the action to be taken given the signal. The contingent contract indirectly specifies the action to be taken through the expected action chosen by the controlling part.

Up front we know that in state S_b , E will always choose a_g whereas VC will prefer a_b as long as the ex ante transfer of monetary result is such that $t_{\theta} \leq 1$ for all θ .

Predetermined contract: a_g if $\theta = 1$
 a_b if $\theta = 0$

Contingent contract: Control to E if $\theta = 1$
Control to VC if $\theta = 0$

As long as the signal is strictly unbiased, there is no difference between the two contracts. But when signal and state do not match, we can observe the difference. If $\theta=1$ in state S_b , E chooses a_b if t_{1b} is sufficiently high. This is different from the predetermined contract which would have led to a_g . Consequently, we can get more flexible action plans through the contingent contracts than predetermined ones.

If we extend our model to three different action, $a \in \{a_g, a_b, a_c\}$, where the first best actions for the two states remain unchanged, and action a_c is Pareto-dominated by a_g and a_b in both states. We further assume that $y_c^b = 0$, and that $l_c^b = y_b^b + l_b^b - \delta$ so that a_c has a high

private benefit even though it is sub-optimal. In this case a contingent contract would give E the control if the signal is good ($\theta=1$). He would then prefer a_c in the case of a bad state ($\theta=1, S_b$) and receive the large private benefits. This would reduce VC's payoff to zero. In order to get E to choose a_b instead, he would have to give away the entire monetary benefit. To avoid this situation, VC could include clauses in the contract, which prevents E from taking action a_c . That would have secured him a minimum payoff larger than 0.

Case example: Distributing the control rights when actions are verifiable

VentureCo demanded to have a redemption right included in the contract (see glossary, redeemable shares), but the founders were worried that VentureCo would choose to terminate TechNova even though the future potential is still strong. In the end, the parties agreed that if no qualified IPO (contingency) has been achieved within five years, VentureCo would be granted the right to demand redemption.

Number of possible actions	Distribution of rights	Example
Two	Contingent	Redemption rights
More than two	Contingent w/restrictions	Board rights

For the founders, it was important to ensure that VentureCo would always be represented by one of the partners on the board meetings. The partners have knowledge and valuable insights which will benefit TechNova if they are present when decisions are made. Without restrictions, a partner with a seat on the board could choose to attend the meetings in person, send a solicitor or simply not show up at all. He will never choose not to attend (or not send a solicitor), as VentureCo would lose significant influence. Attending in person ensures maximal influence, but consumes valuable time. Sending a solicitor might be a satisfiable solution. It ensures a certain level of influence and does not take up his time.

They agreed upon a structure where VentureCo received board seats contingent on investment, however with a restriction; the partner must personally attend the board meetings.

Box 5

3.2.1.4 Summing up

When seeing the characteristics of venture capital in the lights of this model, there are some control right structures which stand out as more appropriate than others. As E is wealth constrained, the probability that VC's financial demands cannot be met with E-control is high. This takes us in the direction of either contingent- or VC-control.

The main question is whether the actions are verifiable or not. We believe that both types of actions can be found. There is a high degree of moral hazard in VC financing, but still there are some actions which are verifiable. With a functional reporting system and verifiable related variables (such as different key performance indicators), the share of verifiable actions will increase. That goes for the VC's actions as well as for the actions of E.

We therefore expect to see control rights distributed not as a unilateral decision, but more in the line of contingent contracts where VC has a higher level of power than E. As there are generally more than only two possible actions, we also expect to see a certain degree of restrictions put on E by VC. Of course, the extent to which the two parties get more or less control rights will also depend on their negotiation power and case specific factors.

3.2.2 Control right mechanisms

When looking into control rights, we use the same principles as Kaplan and Strömberg (2003), dividing the rights into four sub categories: Voting rights, board rights, liquidation rights and redemption rights. In addition there are certain other aspects of a contract which affect the control rights but cannot be fitted into one of the four categories above. We have chosen to label them other rights.

3.2.2.1 Voting rights

Most decisions regarding a company's actions are based on majority, and voting rights therefore provide one measure of control rights. The higher percentage the VC achieves the more influence he has over the company. Kaplan and Strömberg find in their article from 2003 that in the US, VC has a voting majority in more than 50 per cent of all the venture backed companies (Kaplan and Strömberg, 2003).

Dependent on the complexity of the company's financial structure, different shares can have different voting rights attached to them. The main boundary of share dependent voting rights is the jurisdiction. In most western European countries the law clearly states that each share shall have one vote.

3.2.2.2 Board rights

Another aspect of majority control is the board rights. In most companies there is a fixed relationship between voting power and board power, but this is not always the case. Kaplan

and Strömberg distinguish between the normal board rights (the board rights or composition of the board at the completion of the contract) and adverse state board rights (the board rights or composition if the company reaches an adverse stage). The definition of adverse state depends on contingencies which will be further explained later.

When composing the board, we can distinguish between three kinds of board representatives; those representing VC, founder and the external board members. VC and founder can freely choose their proxy on the board of directors. Furthermore they have to agree upon whom is going to fill the board seat(s) reserved for external representatives.

In their research, Kaplan and Strömberg find that VC is less likely to have board majority than voting majority. They also find that the board control of VCs does not tend to increase with the number of financing rounds. It is commonly observed that the board has been given several veto rights, and there are strict limitations to what management can do in terms of investment and changes in corporate strategy without the approval of the board. It may be so that the investor representatives have veto rights which other board members do not have. This is a mechanism used by the VC to ensure that the company is being run according to his wishes.

3.2.2.3 Liquidation rights

The right to liquidate the company is a mean for the investor to ensure repayment. It works as a disciplining factor for the founder, as he knows that in case of underperformance, the VC can liquidate his company. And given that VC has a claim that is senior to the claim of the founder¹⁵, there is a possibility that the founder won't receive any payment at all. This gives the founder incentives to increase the value of the company. Both to keep the VC from liquidating, but also to ensure that he will be paid in case of a liquidation.

3.2.2.4 Redemption rights

The right of redemption is the right to demand that the company buys back the investor's shares at a fixed price. This right is usually made contingent on certain conditions. As with liquidation rights, this is an option for the VC to get his investment back when the company fails to achieve a successful exit within a fixed period of time. For the investor, a redemption rights equals having a long put on all his shares from the founders/company.

¹⁵ Kaplan & Strömberg (2003); The claims of the VCs in liquidation are typically at least as large as the original investment. This is true in 98% of the financings.

3.2.2.5 Anti-dilution

Anti-dilution is one of the mechanisms which directly affects both CF rights and control rights. The aspect of control rights through anti-dilution is a matter of pre-emption rights on new share issues. That is, when an investor has pre-emption rights, he has the right to maintain at least his percentage ownership in the company by participating up to his pro-rata holding. His participation will be based on the same conditions as all other investors. When the new offering is based on a share price lower than the prior price of the investor, there are certain anti-dilution agreements which can kick in, and change the price at which the investor buys. This is the CF rights dimension of anti-dilution.

In most cases there are several exceptions from the pre-emption right. When issues are made for anti-dilution purposes, exercise of warrants or as a part of an employment share program (ESOP), pre-emption does normally not apply.

3.2.2.6 Other mechanisms

There are several, somewhat less important mechanisms which do not fully fit into the main categories. These have in common that they affect the distribution of control rights, and most of them must be seen in light of the following paragraphs about contingencies.

Vesting is a mechanism regulating the founder's right to his earned shares/options. The extent to which he has the right to sell/exercise is regulated by milestones. When using milestones, the founder gains ownership and control of his own shares/options as the milestones are reached, for example, when he has been employed by the company for a certain time. This is a way for the VC to ensure that critical competence stays within the company. It is also proved that when the founder's payoff depends on the final financial outcome of the company, the probability of value destroying behavior (which is possible due to the presence of asymmetric information) is smaller (Hellmann, 1998)

Non-compete and non-solicit clauses are observed in most venture capital contracts¹⁶. These clauses regulate the employee's right to work for competitors of the company. This is a way for the VC to increase his bargaining power and keep the founder from holding-up a later financing round. As many of the venture backed companies are depending on the knowhow and skills of the founders, there would be a substantial loss of value if he decides to leave.

¹⁶ Kaplan & Strömberg: Non-compete clauses are used in approximately 70% of the portfolio companies.

And especially if he was to become a threat to the company, either by starting up for himself, or by joining an existing competitor.

Tag along, also known as co-sale right, has the effect that when one share owner chooses to dispose of his shares, the other share holder with a tag-along right has the right to sell an equivalent part of their shares to the same buyer and subject to the same conditions as the original seller. This reduces the liquidity of the share, and helps prevent sale of shares to outside investors so that the VC's relative control rights remain the same.

Drag along or bring along is an obligation for all share holders to sell their shares to a potential buyer when certain shareholders, normally the VC or all holders of preferred shares, have approved the sale. This makes the company easier to sell, as many buyers of small companies demand a 100 per cent ownership. There are usually requirements for the purchase offer to trigger a drag along. The bid must normally be in either cash or liquid shares and not require the VC to give any warranties or remain in any way obligated to the buyer.

ROFR means Right Of First Refusal, and is the right for all shareholders to purchase a pro-rata share of all the company's shares being sold by any of the other investors. ROFR can reduce the market value of the shares, as many investors will not make an offer on shares when another part has the right to acquire them before him.

3.2.2.7 Staging

As explained under the non-compete and non-solicit clauses, the effort and knowledge of E is crucial to the venture backed companies. The E is an inalienable resource (Neher, 1999) and cannot be contractually bounded to work. Although there can be consequences for the E if he decides to leave (vesting), he still has the right to terminate his working relationship with the investor. If he chooses to do so, the investor is left with the material values of the company. When the financing is staged, i.e. the company receives its financial support in smaller portions spread over time, it is so that the more of the company's value that is associated to the presence of the E, the larger bargaining power does he have in later financing rounds.

For a company to gain value and eventually be sold (either as a trade sale or through an IPO) the value of the entrepreneur must be embodied in the company. This embodiment happens over time as the business plan is realized and the product of the company is taking shape. To

prevent the entrepreneur from holding-up negotiations, the staging should be outlined in a way which always allocated the negotiation process to a time when the entrepreneur's power has just been reduced. The entrepreneur's bargaining power is reduced by significant developments in the company such as patent approvals, closing of important deals, production of a prototype etc.

3.2.2.8 Contingencies

In order for contingencies to have any effect, there must be some verifiable factors on which the contingencies can be based (recall discussion about automatic conversion). Possible underlying factors are output, performance of different kinds or actions made. Contingencies are especially important what stage financing regards. The contingencies, upon which the contracts are written, can be totally independent of cash flow, but still be a measure of financial performance.

Vesting is an example of a mechanism which can depend on several different factors. Kaplan and Strömberg (2003) find examples of vesting based on different factor such as product functionality, patent approvals and time employed.

3.2.2.9 Summing up, control right mechanism

When used correctly, the mechanisms described above lead to a distribution of control rights which is Pareto optimal (Kirilenko, 2001). When the level of control rights given to the investor is high enough to prevent principal-agent problems and an entrepreneur gives up control and thereby loses utility, it is not so that the investor correspondingly increases his profits. Therefore the investor will not demand a higher degree of control than he needs, since he then has to compensate the entrepreneur. By minimizing the investor's costs and the entrepreneur's loss of utility, we will reach a Pareto optimal stage, where the entrepreneur retains as much control as possible, and the investor completes the venture finance deal with the highest possible payoff. If there is competition in both the VC and the entrepreneur market, this state can be reached through bargaining processes.

4. Analysis

The theory presentation in the previous chapter outlines, to some extent, optimal structures for venture capital contracts. However, these structures are based on several assumptions and do not necessarily fit into a real-world context. Kaplan and Strömberg (2003) compare characteristics of US venture capital contracts to financial contracting theory, and they conclude that real-world contracts are somewhat more complex than existing theories predict. To our knowledge no such comparison has been made for Norwegian contracts, and neither have we tried to pursue such an extensive empirical study. Nevertheless, we have analysed a sample of contracts and in the following chapter outlined the main mechanisms applied.

These mechanisms are discussed in the light of relevant financial theory and findings from the US venture capital industry.

4.1 Data sample

4.1.1 Sources

The Norwegian VC market is a small market with rather few participants, and information requirements from the authorities are limited due to the fact that the portfolio companies are privately owned. This causes a low level of transparency, hence, information gathering is difficult without the cooperation of the venture capital investors. External sources, such as public databases and previously conducted research are few, because the Norwegian venture capital market is immature and still limited in size. However, the Norwegian Venture Capital Association was founded in 2001, and every year since they have published membership lists and industry analysis.

Gathering data, we contacted the members of NVCA asking for access to information about their ongoing and previously conducted transactions and the respective contracts. We received an answer from approximately 50 per cent of the members. However, two thirds of the respondents were negative due to confidentiality issues or lack of either time or resources. Eventually, only four of the positive respondents were willing to provide all of the requested information and opened up for further dialogue. From these four companies we ended up with a sample of 15 venture capital contracts. We have outlined a checklist organising the contractual provisions according to the structure used in this thesis (i.e. cash flow rights and control rights. Example attached in appendix I). Each individual contract was analysed step by step by applying one respective copy of the checklist. In the end, all observations were summed up. From the aggregated results, we observed the main features of the contractual mechanisms used. The results are presented on an aggregated level due to confidentiality agreements. Since our sample of venture capital firms is limited (only four), an extensive table explicitly illustrating the results cannot be presented, as people with industry specific knowledge could possibly identify individual firms and transactions.

Our sample of contracts represents the three largest venture capital sectors; life science and biotech, information and communication technology (ICT) and oil and energy. Referring to

figure 10, these three sectors are by far the most important in the Norwegian venture capital industry.

4.1.2 Criticism

The NVCA industry analyses are based on voluntarily submitted questionnaires, hence, the level of accuracy and objectivity cannot be guaranteed. Still, NVCA is the information provider with the deepest and most extensive knowledge of the Norwegian industry.

Even though our sample of contracts represents the most important sectors, the total number is too small to provide us with statistically significant results. But as the approach in our analysis has more of a qualitative than a quantitative character, statistical significance is not crucial.

With only four companies represented in the sample, there is a possibility that our findings are biased by company specific factors, and thus do not represent the mechanisms most commonly applied in the Norwegian venture capital industry.

4.2 Cash flow rights

4.2.1 Financial claims

4.2.1.1 Liquidation preferences

When structuring a financial contract there are numerous financial claims available to investors, and in the mezzanine¹⁷ category the only constraint seems to be creativity. However, from the previously outlined theory only, convertible preferred shares or convertible debt to VC and common (ordinary) shares to the entrepreneur induce optimal behaviour and investment incentives. This is aligned with our findings. Even though the structure is not always the same, all contracts use an element of convertible securities. The most common are convertible preferred shares. But note that without a more senior debt claim, the convertible preferred payoff, and hence the provided incentive, equals a convertible debt claim. In venture capital jargon the financial claims are known as liquidation

¹⁷ Non-conventional funding that shares characteristics of both debt and equity (BusinessDictionary.com)

preferences¹⁸. From the preferred share category we observe two sub-groups: Full participating and simple participating. These refer to the liquidation preference attached to a specified class of preferred share when the residual payoff (remaining proceeds after all debt and preference claims are covered) is divided between the owners of the venture. Relating it to the theory discussion, full and simple can be viewed as two different levels of α .

A full participating provision includes the preferred shareholder on the same level as the ordinary shareholder when sharing the residual payoff, i.e. the remaining proceeds are distributed pro rata among all shareholders (figure 17). In practise, after receiving the preference amount the preferred shares are converted into ordinary shares on a one to one basis.

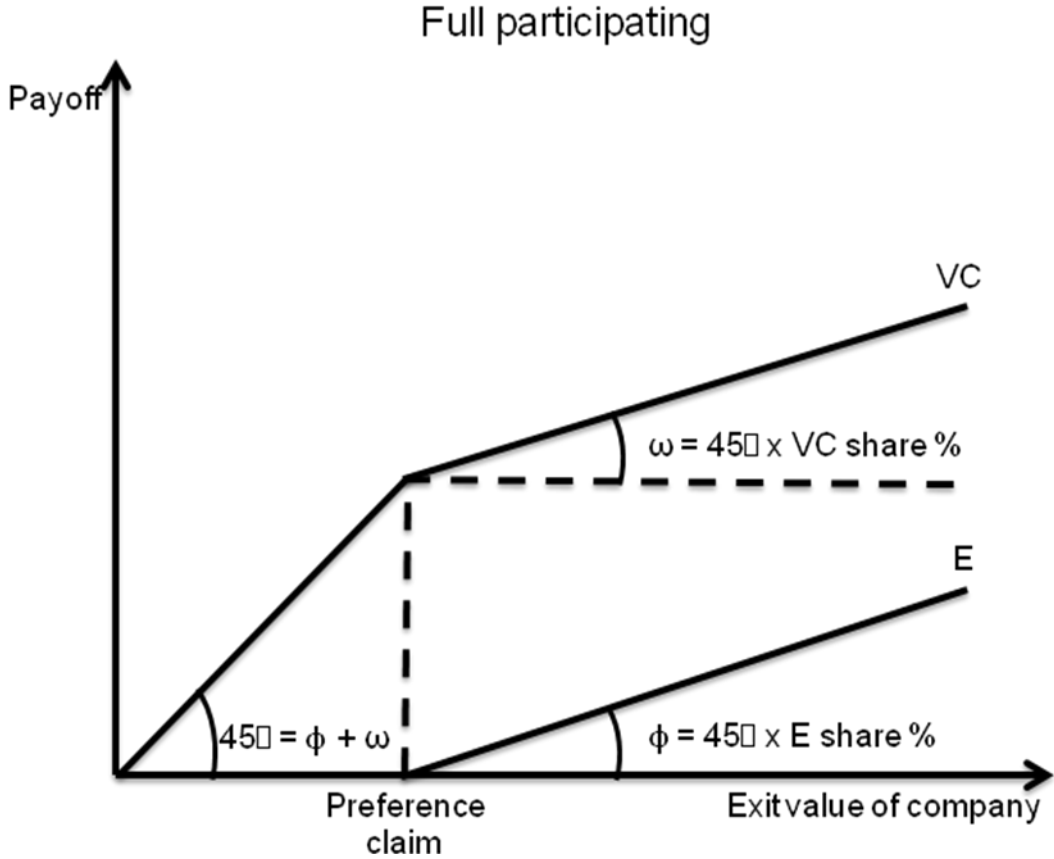


Figure 17

A simple participating provision implicitly include a “catch up” given to the ordinary shareholders (entrepreneur/management), thus reducing the VC’s fraction of the residual

¹⁸ The liquidation preference is a right which can be required by venture capital investors in recognition of the risk they bear on their capital contribution (BVCA, pp. 10)

payoff (figure 18). The “catch up” provides the ordinary shareholders with a right to receive a catch up amount before the pro rata distribution of the residual payoff. The observed size of this catch up amount varies from contract to contract. Most likely, the observed amount in each contract is a result of the VC’s prediction of required incentives for each individual entrepreneur.

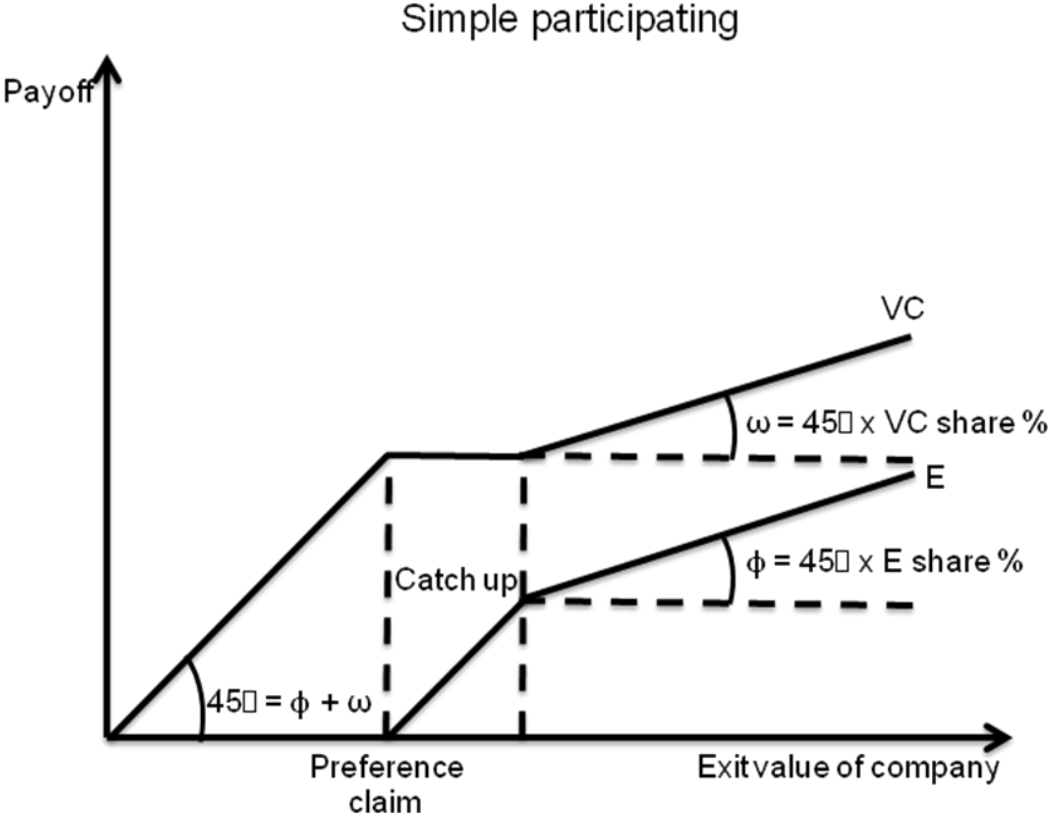


Figure 18

In our sample we most frequently observe a full participating provision. There might be several reasons to that. Recall the double-sided moral hazard problem from the theory presentation; both the entrepreneur and the venture capitalist need proper incentives in order to exert an optimal level of effort. And as seen from figure 17 and 18, both full and simple participation provide double upside incentives. However, the simple participation provision represents a lower α because of the catch up. And a lower α not only increases the entrepreneur’s incentives, but also the probability of window dressing. By choosing a full participating provision, the VC discourages window dressing because the “punishment” for signal manipulation is more severe. One important remark is that window dressing comes as a consequence of staging. As mentioned in the theory chapter, the entrepreneur manipulates the

signal in order to achieve short-term goals such as continued financing (next stage). All contracts in the analysed sample are from early stages in the financing cycle, hence mostly A and B preferred classes (some C and D) where window dressing is a more severe problem. Several levels of preferred classes are used in order to retain seniority for early investors and to differentiate when it comes to control rights.

Liquidation preferences are generally triggered by a liquidation event (explained in the next paragraph). However, there might also be cash flows from the venture before a liquidation event. Most mature companies usually pay dividends to their shareholders, but companies in need of cash, such as start-ups and expansion ventures, do not pay regular dividends.

According to Kaplan and Strömberg (2003), 43.8 per cent of the companies in their sample pay so-called cumulative preferred dividends. These are not regular dividends paid with predetermined intervals; instead, the dividends accumulate and are added to the preferred liquidation claim. This makes sense since most ventures are in constant need for cash due to high growth and investment rates. Nevertheless, this is not reflected in our findings.

Approximately 80 per cent of the analysed contracts include preferred dividend payments, but none of them apply cumulative dividends. Interestingly, this observation is not entirely true, because in several contracts the entire preferred claim could be interpreted as cumulative preferred dividends. By digging deeper into the various preferred claims applied, we find two different structures; accumulation of a percentage rate each year (generally reflecting the cost of capital) and x times initial investment (x equals one or two) when liquidation preferences are triggered. The accumulation of a percentage rate each year is somewhat equal to cumulative preferred dividends, thus some contracts use an implicit cumulative preferred in addition to regular. The difference is that whether to pay a dividend or not must be voted upon every year, while the preference claim is decided during the contract negotiations. Hence, changes in bargaining leverage and control rights throughout the investment period might make a difference to the end result.

4.2.1.2 Liquidation events

An important function of a venture capital contract is to clarify when the liquidation preferences are valid. On one side the VC endeavours the possibility of an easy and profitable exit, and on the other side the entrepreneur seeks the possibility of attracting fresh investors in future stages of the company's development. In the analysed sample of Norwegian VC

contracts we have observed several events that trigger liquidation preferences, so-called deemed liquidation. All contracts include at least two of the following: Initial public offering (IPO), Merger and acquisition (M&A), trade sale (disposal of a company's shares), sale of assets, change of control. They are all well-defined verifiable events, hence, according to the theory a suitable signal for automatic conversion. In the majority of the observations, automatic conversion works implicitly through the liquidation events and the full/simple participating provision. However, in the cases where the liquidity preferences equal convertible debt claims, specific automatic conversion clauses are stated. A peculiarity is that very few contracts include specific criteria concerning what is a qualified IPO or a qualified M&A. Moreover, some do not even specify what is meant by "sale of assets" or "change of control". In general, those who demand a qualified IPO use criteria such as; valuation exceeding a minimum threshold and only offerings on an approved stock exchange. A "sale of assets" event is usually identified by a sale of all or a substantial amount, "trade sale" by a sale of more than 50 per cent and "change of control" by a transfer of more than 50 per cent of voting power. The most frequently used liquidity event is "sale of assets".

4.2.1.3 Redemption

Another perspective, which also concerns the VC, is the possibility of an exit if the venture does not prove to be a success. Recall from the theory presentation of control rights, that a provision called redemption enables the VC to reclaim a part of its investment by selling its shares back to the company. The cash flow perspective of this provision is \underline{v} , which from the theory represents the remaining value when the entrepreneur is protected by limited liability. Because of various judicial aspects, the redemption amount is often subject to restrictions, nevertheless, it can be viewed as a minimum recovery amount for the VC (figure 19 illustrates full participating with redemption and figure 20 simple participating with redemption). And hence, in a certain way reflects \underline{v} .

Full participating with redemption

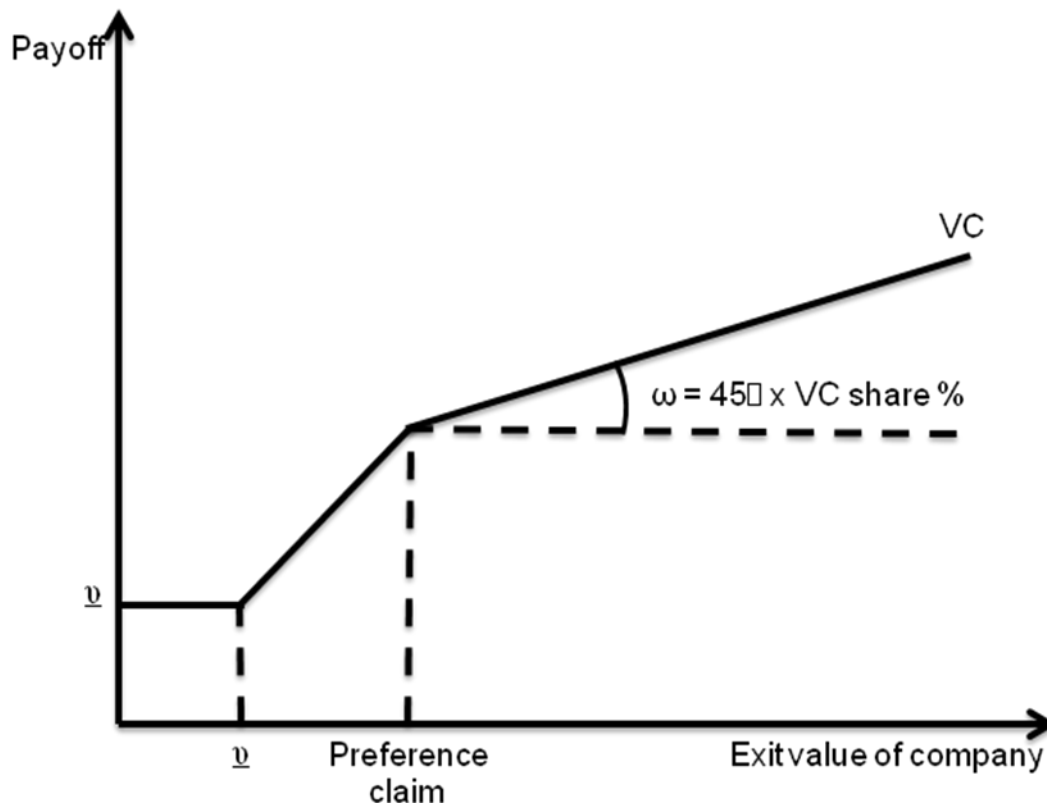


Figure 19

In the analysed sample, 50 per cent of the contracts applied redemption provisions. The majority were restricted to redemption first after a period of five years. This five years period strengthens the theory assumption regarding a floor limit on the redemption of the VC investment. Owing to the fact that if the venture still operates after five years, it is more likely that it could fulfil a possible redemption demand. On the contrary, if the burn rate¹⁹ is too high and the expected (future) value creation is low, a floor limit is nonsense, because the venture will then obviously not be able to buy back any shares. A very interesting observation, however only in one contract, was a minimum threshold cancelling out redemption provisions if the value of the venture dropped below. This provides to some extent a downside coverage, but also in a way adapts to the fact that if the venture investment completely fails, there is no possibility for a buy back.

¹⁹ The rate at which a company is consuming cash each month (BVCA).

Simple participating with redemption

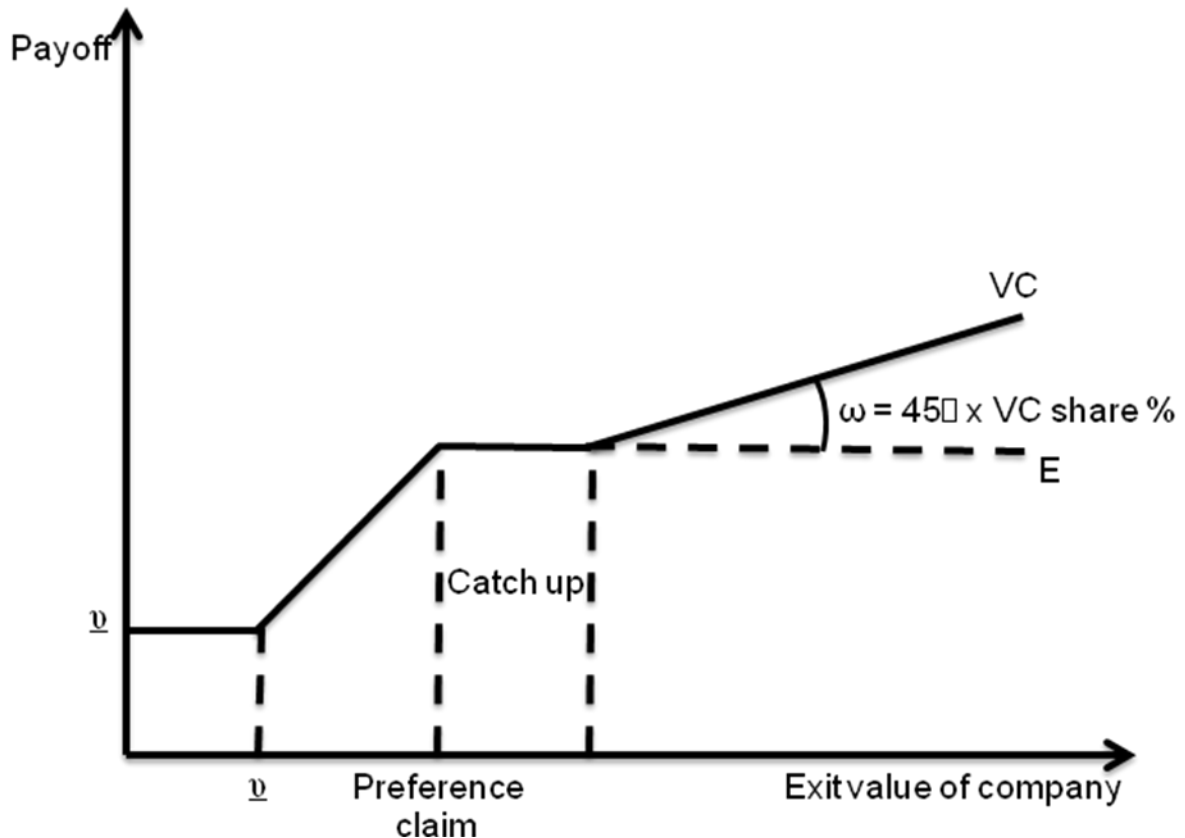


Figure 20

4.2.1.4 Anti-dilution

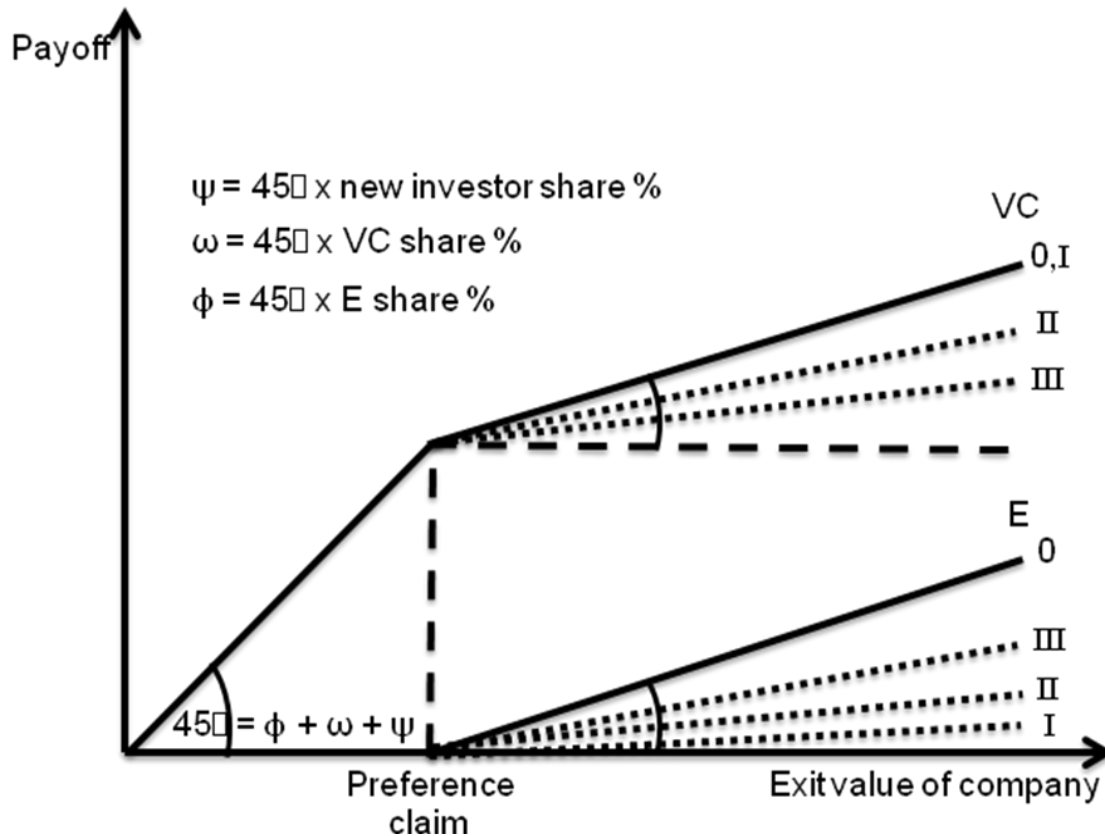
Analysing the use of anti-dilution provisions is a rather complex task. As previously mentioned in the theory chapter, there are no initial arguments that bring us to an obvious solution. Both sides have rational arguments for their views. Nevertheless, there are some indicators that could be used to assume reasonable outcomes. We have tried to indicate that supply and demand of risk seeking capital affects the bargaining power of the venture capitalist and the entrepreneur. Something, which ideally should make us capable of assessing whether the appropriate anti-dilution provisions are applied or not in our sample. By appropriate we mean in favour of the strongest party. From our observations there are no systematic changes over the sample period (1998 to 2008). However, there is a strong bias towards weighted average. Out of those who apply anti-dilution protection, only one out of four apply full ratchet. This is in line with the findings of Kaplan and Strömberg (2003) (US, December 1986 to April 1999), but higher than the numbers reported by Fenwick and West (San Francisco Bay area, Q2 2002 to Q3 2006, see figure 15). It seems that the most

important factor affecting whether a provision is applied or not is the venture capitalist. Some do not use it at all. In total three out of five contracts use anti-dilution protection.

In the theory presentation the anti-dilution protection was exercised through a change in the conversion ratio. But in our sample the majority (approximately 40 per cent) implemented such protection by issue of warrants. We find that warrants usually are combined with issuing a number of shares to nominal value, and sometimes the investor can even choose between the two. Other mechanisms more or less randomly applied are cash payments and nominal share issuance without warrants.

So how do the observed anti-dilution protections affect cash flows? We can conclude that in the analysed sample there are three different directions; full ratchet, weighted average and no protection. Some contracts use a provision called “pay or play” (sometimes referred to as “pay to play”), which means that the existing investors either participate in the new round (play) or become diluted (pay). Recall from the theory that full ratchet preserve investor’s ownership percentage and value in all down rounds, thus the venture capitalist’s cash flow will not be affected. But on the other side, the existing common shareholders (in this case the entrepreneur) will be heavily diluted. If a weighted average protection is used, both the venture capitalist and the entrepreneur will be diluted. The venture capitalist less severe than if no protection is used and the entrepreneur more severe than with no provision but less than with a full ratchet (figure 21). Note that in figure 21 it is assumed that the new investors receive ordinary shares with lower seniority than the initial venture capital investor, hence it only affects the pro-rata sharing of the residual proceeds. To a certain extent, seniority protection is aligned with our findings, however, we observe that expansion investments most frequently are financed by issuing new classes of preferred shares and not ordinary shares. This will also affect the VC payoff function to the left of the “preference claim” in figure 21. Of course, the dilution effects only apply if the existing owners do not participate in the new offerings.

Comparing full ratchet, weighted average and no protection



- 0: Prior to subsequent investment round.**
- I: Full ratchet provision.**
- II: Weighted average provision.**
- III: No protection at all.**

Figure 21

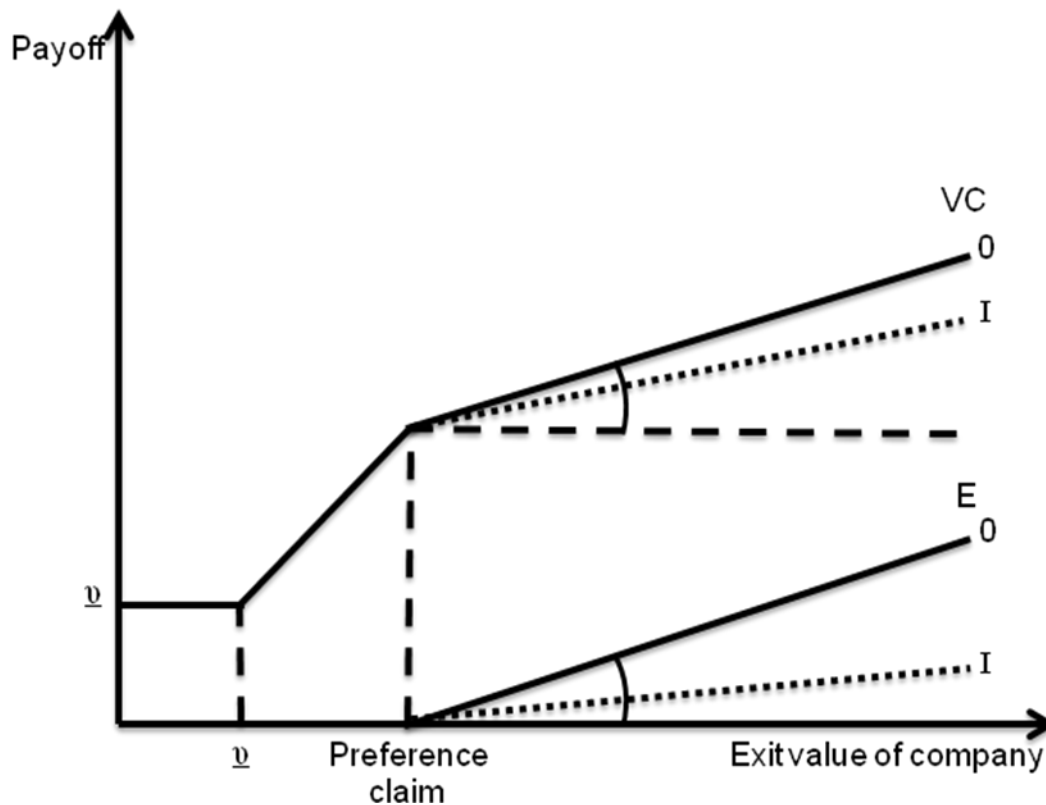
So far we have focused on the effects of the different anti-dilution provisions and how frequently the various types are observed. In the following we will try to explain our observations. Above we mentioned bargaining power and the fact that there are no observable differences across the time period. Even so, the majority of the contracts are written after the burst of the high tech bubble, an interval with, on average, high growth and increasing investment rate. This is a very weak explanation and is more in the category of guessing than explaining. Another and perhaps better explanation could be that the venture capitalist are afraid of fully diluting the upside incentives for the entrepreneur. Recall that full participating was the most frequently observed liquidation preference, hence the upside incentives for the entrepreneur is already weakened and further incapacitating will probably evaporate them. This leads us to the question whether there is a link between on one side full participating and weighted average and on the other side simple participating and full ratchet. From the size of

our sample, this question does not receive a fair answer, however, logically it seems that it should be some kind of interconnection due to the upside incentive issue. Finally, there is still one more thinkable explanation; according to VentureOne (2005), 64 per cent of all anti-dilution provisions in the US are cancelled in subsequent financing down rounds and the remaining 36 per cent do often not work as they were supposed to. They explain their findings by the fact that if the applied anti-dilution provisions are to effective, no new investor will accept the terms, especially in down rounds. Rationally, new investors refuse to suffer because the initial investor did a bad investment. Hence, it is no use agreeing upon a full ratchet protection if it is not sustainable.

4.2.1.5 Summing up: The most frequently observed structure

Based on the combined findings for all cash flow right provisions, we have in the following paragraph outlined the most frequently observed structure. As illustrated in figure 22, it consists of a full participating liquidation preference and a redemption floor, with a weighted average anti-dilution protection. However, this is not completely in line with the conclusions from our theory analysis. Recall the illustration of the payoff diagram from the optimal combination of financial claims in figure 13. Figure 13 presents an intermediary step between the point where the value of the venture equals the face value of the debt claim and the preferred conversion point. This horizontal interval is not a part of the payoff function of a full participating preferred share. Instead, it seems to look like the payoff function of a simple participating preferred share with redemption (figure 20). This leads us to the question whether the most frequently observed payoff structure provides first best investment solutions? The criteria from the theory chapter are: The venture capitalist's post conversion payoff must compensate him for exerting his optimal amount of effort, and the conversion option is profitable only if the entrepreneur exert his optimal amount of effort. Certainly the venture capitalist will be compensated, because his upside payoff is higher with a full participating provision. But the question is whether the entrepreneur's incentives are powerful enough to induce him to exert his optimal amount of effort?

Most frequently observed structure



0: Prior to subsequent investment round.

I: New investment round with weighted average anti-dilution provision.

Figure 22

4.2.2 Pay-performance sensitivity

In the theory presentation of pay-performance sensitivity, we discussed the different parts that are commonly included in a remuneration package: Equity holdings after IPO, options, salary and shares sold. We exclude shares sold since its pay-performance sensitivity is equal to zero. Salary is observed in all contracts and is the main remuneration factor, however, with a quite low elasticity, its impact on total pay-performance sensitivity is minimal. Equity holdings vary considerably among the different observations in our sample. Hence, we cannot highlight a general impact from this remuneration factor. Approximately 50 per cent of all contracts include employee share option plans (ESOP). ESOPs consist of a pre-specified percentage of all issued shares, which are reserved for share option grants to current and future employees. In general, entrepreneurs and managers with significant shareholdings are often excluded from the ESOP. If this is the case, it would certainly not affect the pay-performance

sensitivity of the remuneration package. Pay-performance sensitivity is a rather complex issue and our data is not detailed enough to come up with good predictions of the pay-performance level in our sample of venture capital contracts. We consider this as an important issue in the structuring of optimal venture capital contracts; hence, pay-performance sensitivity is thoroughly discussed in the theory section.

4.3 Control rights

4.3.1 Voting rights

Although we observe frequent use of different share classes (such as A, B, C and D shares), the contracts have that in common that all shares have equal voting power. There is one vote attached to each share, independent of share class. The Norwegian Companies Act permits restrictions on voting rights for different classes of shares or share owners, but we have found no contracts where this has been used. One explanation could be that in the corporate governance literature, it is considered good corporate governance to operate by the one vote per share rule. This might result in consensus among the players in the industry, and lead to self fulfilling expectations.

4.3.2 Board rights

In our material, we find that an average board of directors consists of 5.4 members, with the smallest boards having only 3, and the largest board of directors having as many as 7 members. The Companies Act states in §6-1 that a company with more than three million NOK in share capital has to have at least three board members. This applies to all of the companies in our sample, and is probably the reason why we do not observe any companies with a smaller board of directors than 3 members.

The companies with more than 5 members on the board often have a higher number of investors. Therefore they also need to have a larger board of directors in order to give the investors the board seats they demand.

When the board of directors is gathered to vote on which action to take, it is clear to everyone present, who votes in favor of which proposal and which action is being taken in the end.

Hence, actions are verifiable and we expect some kind of a contingent control right allocation, possibly including one or more prohibitions.

It is obvious that the board rights cannot be unilaterally distributed. If the rights were to be given to one party, there would in reality be no need for the board of directors. Then the party with control rights would do just as he pleases, whereas the others would have no real voting power at all. That makes unilateral control right allocation inefficient for board rights. But do we observe the expected contingent control right allocation?

Although the VCs have invested substantial amounts in their portfolio companies and often have the majority of shares, we only observe VC majority on the board in three companies. This is consistent with the findings of Kaplan and Strömberg (2003). But even if they do not have the majority, they still have powerful positions on the board of directors.

Under board rights, the right to veto a proposal can be seen as a sub-category. These are the rights to prevent an action from being taken. They are never given to E, only to VC contingent on the presence of different specified scenarios. In our contracts, the most common areas where the VC has veto right are: Transfer of shares, change of business plan, recapitalization and sale of substantial and important parts of the company (often also embraced by the liquidation preferences).

The veto right is a way for E to ensure a potential investor that certain predefined and verifiable actions cannot be taken without the approval of the investor. Thereby he reduces the moral hazard problem. For the VC, it is worth quite a lot knowing that E cannot engage in value destroying activities.

In advance, it might be difficult to know the VC's preferred actions when it comes to the issues embraced by the veto rights. Whether he wants the business plan altered or not two years from now depends on how the company and the surrounding factors evolve. Therefore it is not efficient to give either party the authority to chose action, but rather let one party have the right to refuse it. Then the action will not be taken unless it is a Pareto-improvement, as E has to suggest (VC will not veto his own proposal), and the VC has to approve. E will not suggest anything not making him better off, just like the VC will not approve anything not making him better off than he already was.

In addition to the veto rights, the board is normally bound by several contractual restrictions limiting their real power. These restrictions prevent the board of directors from leading the company in other directions than the one the VC set out when the contract was signed. Most of the restrictions are limiting the impact the board of directors can have on the VC's position in the company.

The distribution of board rights is complex and the model is not fully applicable. The decision right is not (in normal situations) contingent on signal, but on who has the majority in the board. This majority is usually dependent on coalitions and cooperation between the different players represented in the board. We found that except from the three portfolio companies mentioned, no boards had a majority of either E or VC. There is usually an even number from E and VC, and in addition one or more representatives from other shareholders, stakeholders or from a neutral part.

The power the majority has is limited by the veto right given to the VC. This veto rights are made contingent on scenarios, consistent with the predictions of the model.

To signals: $\theta = 0$, E does not propose an action VC can veto against

$\theta = 1$, E proposes an action VC can veto against

Two actions: a_g , no veto

a_b , veto

Here the control right is given to VC contingent on the signal $\theta = 1$. If VC approves the suggestion, he chooses action a_g , and if he disapproves he chooses to veto, action a_b . As there are only two actions that the VC can take, there is no need for E to limit VC's possibilities by including restrictions in the contracts.

From our sample it is difficult to find that one of the sides clearly dominates the other when it comes to voting power in the board of directors. E and the VC are in general equal in terms of voting power, but the contractual restrictions put on the board and the veto rights given to the VC shifts the control right allocation in favor of him.

4.3.3 Redemption rights

The right to redemption is the VC's last resort, and ensures him at least a part of his initial investment back. When the action is taken and a company is being subject to the VC's demanded redemption, there is no doubt to any of the parties what is happening. Hence, the action "redemption" is verifiable.

Seen from a logical perspective, it is clear that this right cannot be given to E. He has never any interest in putting the company to sleep or in giving up his chances at a potential upside. Giving him the control would imply removing the effect of redemption as a mechanism, but neither is letting VC have the unilateral right a way of insuring first best action being taken. In most situations, VC will choose the actions leading to first best scenario, but not always. Outside effects can interfere and cause the VC to lose perspective, and consider a long term investment on a short term basis. For example: If the VC faces liquidity problems, and has to come up with cash to quickly pay his creditors. Then he might choose to demand redemption, in order to free as much cash as possible on short notice, even though the signal is good and the company is most likely to succeed.

To ensure that the first best action is being taken, most of the contracts in our sample specify certain contingencies upon which the right to demand redemption is given to the VC. This is in line with our model. As none of the players have incentives comonotonic with total profit, the control right should be allocated based on contingencies which are verifiable and lead to a situation where the part taking the decision is sure to choose the first best action. We do not observe any use of prohibitions and clauses restricting action when it comes to redemption rights in the contracts. To understand why, remember that when there are only two choices of actions, the contingent contracts are more efficient than the predetermined ones due to the increased flexibility.

The contingencies most frequently used are related to performance and time. If the company does not succeed in achieving a qualified IPO or a trade sale within a certain time, the VC is granted the right to redemption.

Interpreted in the model, we can present it like this:

Two signals: $\theta = 0$, the company has not succeeded in achieving an IPO or a trade sale

$\theta = 1$, the company has achieved an IPO or a trade sale

Two states: S_g , the company becomes a “high flyer”

S_b , the company does not become a “high flyer”

Two actions: a_g , not demand redemption

a_b , demand redemption

If the signal is good ($\theta = 1$), the company has already been listed or sold (the good state has occurred):

$$\theta = 1 \rightarrow S = S_g$$

The choice (and reason) to demand redemption does no longer exist. This equals action a_g , which is in line with the preferences of both E and VC.

If the signal is bad, the company has not succeeded within the limited time. The VC wants redemption and E wants to keep the company running. The realization of signal $\theta = 0$ triggers a transfer of the right to choose whether the company should live or not to the VC, and VC chooses a_b in line with the model.

The use of this mechanism is clearly shifting the control rights balance in favor of the VC. He gets his first best choice no matter what, whereas E only gets his will in the case of a good signal.

4.3.4 Liquidation preferences

The right to liquidate the company is one of the most crucial rights for any venture capital investor and entrepreneur. The liquidity preferences enable the VC to receive his payoff in cash, and ensure E that he can attract new investors if the company performs extraordinary well and gets listed.

Liquidation is a verifiable action, and like in the case of redemption rights, there are only two possible actions: $a \in \{\text{liquidate}, \text{not liquidate}\}$. Hence we expect the same contract structure as for redemption; the right to liquidate distributed between the parties contingent on some verifiable signals.

However, that is not what we have found. Although we have only two possible actions, we find that the contracts have predetermined actions for the different scenarios. It is not so that one party receives the right to liquidate in case of the predetermined events. Instead there are clauses in the contracts specifying liquidation in case of so-called “liquidation events” taking place. The most used liquidation events are: A qualified IPO, a merger or acquisition, change of control in the company, sale of a substantial part of the assets and trade sale.

Based on the model, one can wonder why the rights are not distributed contingent on the signal like the model predicts, but rather predetermined actions. We believe it is because the model is not applicable in this situation. The liquidity events are not signals giving a higher probability of one state of nature than for the other. They are 100 per cent certain signals. If there is a qualified IPO, we are 100 per cent certain that the state is good.

$$\beta^*g = P(\theta = 1 | S_1g) = 1$$

$$\beta^*b = P(\theta = 1 | S_1b) = 0$$

Instead of writing a contract where the right is given to E contingent on the liquidity events upon which he would prefer to liquidate and to the VC contingent on the events upon he would prefer to liquidate, they have chosen a simpler version. By defining the liquidity events up front, they avoid arguments and negotiations and get a more efficient contract where there is no room for doubt whether the company should be liquidated or not.

4.3.5 Anti-dilution

Unlike the other rights we have mentioned so far, the pre-emption side of anti-dilution is a one sided right protecting only the VC. Even if the contract includes a pre-emption right to E, it is useless for him in real life. Due to his wealth constraint (recall that one of the assumptions upon which our models are built is that E has no initial wealth); it is not possible for him to acquire new shares anyway.

When the VC exercises his right to pre-emption, it does not happen on the expense of E. The new shares would be issued anyway, and as E cannot buy, VC's purchase does not reduce his control more than it does when another investor buys the shares. Hence, pre-emption is not comparable to the other control-rights, as it only affects the ownership share of the VC (and thereby his control and influence over the company), but not the control right balance between E and the VC. The anti-dilution can therefore be said to be neutral when it comes to shifting the control right balance of the company between E and VC, and does not work in favor of one of the parts on the expense of the other. It is simply a result of the VC taking advantage of his capital to strengthen his position on the expense of other potential external investors.

What about the exceptions to the pre-emption rights, can they affect the balance? As long as E has no capital for which he can buy new shares, it does not matter who buys them, as E is going to see his ownership share being diluted anyway. On the other hand, what the exceptions theoretically can do, is to inflict the VC in a negative way. One can imagine restrictions on the VC's rights preventing him from increasing his percentage ownership, or at least keeping the ownership on the same level, but in our sample of contracts we find no such exceptions. The exceptions are the same in most of the contracts, and include only such issues where it would not be logic to offer shares to the share owners. The most frequently used exceptions are:

- New issues made for anti-dilution purposes. If anti-dilution shares were to trigger new anti-dilution issues, we would have a never ending spiral.
- Exercise of warrants. The value of warrants is already calculated for, and they would lose value if anti-dilution efforts were to be made. Then the person receiving the warrants would demand a higher number of warrants, which again would trigger more anti-dilution shares to be issued and so on.

- Issue of shares as a part of an “employee share option plan” (ESOP). The reason is the same as for warrants. If their employee’s shares would be diluted by new share issues, they would lose value, and the company would have to grant the employees more shares.

4.3.6 Non-compete and non-solicit clauses

As said earlier in the paper, there is a double-sided moral hazard problem. I.e. both E and the VC can carry out hidden actions destroying the value of the other party. We therefore expected to find non-compete and non-solicit clauses restricting both the VC and E’s possibilities to engage in negotiations with competitors or potential competitors of the firm.

For an action to be prohibited, our model assumes that the action is verifiable and that there are more than two alternative actions that can be taken. Non-compete clauses restrict the ability of one part to engage in any kind of activity with companies that, directly and indirectly compete with the company. The range of possible actions covered by this clause is huge. Everything from discussing possible cooperation to actually start working for the competitor falls under the jurisdiction of non-competition clauses. So it fits the model when it comes to a number of possible actions. What is not so easy to conclude, is to which extent the actions are verifiable. In our opinion that differs within the range of possible actions. Some actions, like terminating the employment with the company to start working for a competitor are easily verifiable, whereas other actions, like discussing future plans are difficult to verify. According to the model, the right thing would then be to separate the actions which are verifiable and not, and handle them separately with prohibitions for the verifiable ones, and contingent control rights for the unverifiable.

The problem then, is that the contract would be very long. As the range of possible actions to be covered by such a contract is so extensive, this would not be an efficient solution. And as long as all the actions governed by the general non-compete clause are undesired (from the VC’s side) actions, it is much easier to prohibit them up front.

In addition to a more efficient contracting process, we also achieve a contract with less room for hold-ups. If none of the parts have the right to decide, the other part has nothing to gain

from threatening to hold-up or in other ways sabotage the company. Such actions could potentially cause huge dead weight losses, as a person seeking to leave the company has nothing to lose from the company struggling in the time after his resignation.

In the contracts we observe that the non-compete and non-solicit clauses apply only for E. There is nothing mentioned anywhere about the obligations of VC in such cases. This is clearly pushing the control rights balance in favor of the VC, as his actions are not restricted in the same way as E's actions. We also have to mention, that it is more likely to observe that E wants to leave the company to start working with a competitor than VC doing the same. E's capital is his human capital, which he brings along if he decides to break out of the cooperation with the VC. The VC has capital invested in the company, and risks losing the investment if he breaks out. So even though in theory, the clauses should apply evenly to VC and E, there are practical reasons to why E is more restricted than VC.

4.3.7 Vesting

Vesting has much of the same effects as non-compete and non-solicit. It is a mechanism that inflicts losses on E if he decides to terminate his contract with the company.

In our sample, we have found surprisingly few examples of vesting. In venture capital theory, vesting is commonly known as a well functioning tool to prevent the key personnel from leaving the company before their value is fully incorporated. In our sample, only one company included this in the contract. They had 25 per cent vesting per year for four years. So if E was to terminate his employment before four years had passed, he would not be allowed to take with him all the shares he had earned. If the company shows a positive development, that can be a high price to pay for leaving early.

Instead of vesting, we found several contracts that included "buy back". I.e. a right the company has to buy back the shares from key personnel leaving the company before a certain time. The price at which they buy back can be set at different levels. We found that the typical duration of a buy back was two years, and that the typical buyback price was equal to lowest issuing price or subscription price minus a discount.

To compare the effects of buy back and vesting, we have created the following example where we assume that E has one share in the company (figure 23). The share price is shown with the red line. The blue line represents the payoff for E if the contract includes a buy back clause with duration of 4 years and a buy back price set to 50 per cent of subscription price. The black line represents the payoff of an entrepreneur whose contract include a vesting clause with duration 4 years and 25 per cent per year.

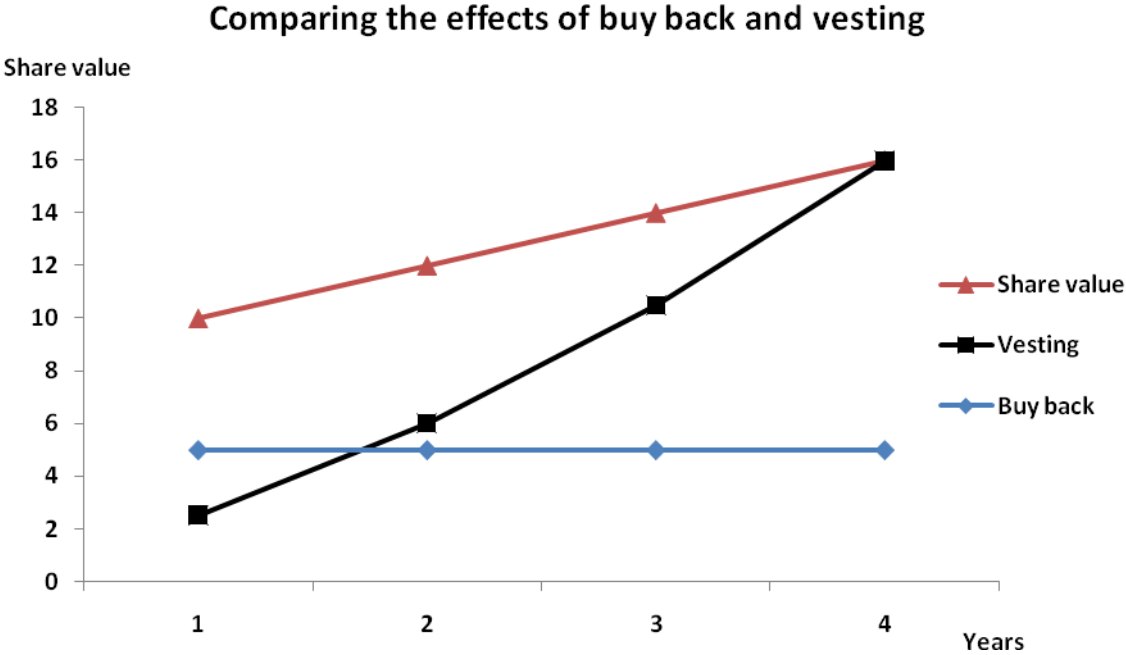


Figure 23

The chart paints a clear picture of the differences between vesting and buy back. As the payoff to the entrepreneur with a vesting provision is approaching the true value of his share over time, the payoff to the other entrepreneur remains at a constant, and the share he gets of the real value decreases for every year. As the four years have passed, both entrepreneurs have the right to 100 per cent of their share, and they then get a payoff equal to the market value.

A contract with buy back is better for an E who is going to quit early, and then incur a loss as small as possible. As vesting concerned, the longer period of time the better E will be compensated if he decides to leave. Recall the earlier discussion about staging, where we explained that the value to the company of E is larger in the beginning and becomes smaller as more and more of E’s human capital is incorporated in the company. Following that,

vesting seems like a more efficient mechanism than buy back. And to E vesting seems much fairer, as he receives a compensation that increases with his own investment of human capital in the company.

Still, buy backs are the most commonly used mechanism of the two in Norway. One possible reason might be that the VC expects the probability of E quitting to be higher after a few years than in the beginning. To give E the incentives to stay throughout the contracted period, the consequences of leaving has to be as large as possible. For an informed E, the use of buy back can be a bad signal. He might wonder why the VC believes that there is a higher chance of him leaving after a few years. Do they have plans which will reduce his private benefits? If E thinks like this, including buy back instead of vesting can be expensive for the VC, as E demands compensation for possibly reduced future private benefits.

Both vesting and buy back are mechanisms helping the VC to control E, and thereby shifts the balance of control in direction of VC. But it could be that they are paying a high price for it. Maybe they would get the same effect from shifting from buy back to vesting, and thereby reduce the compensation of E?

4.3.9 Drag along

In all the examined contracts we found the mechanisms ROFR (right of first refusal) tag along and drag along. ROFR is set as default by the Norwegian Companies Act (§4), but can be put aside if stated in the bylaws or by the board of directors with at least 2/3 majority. Tag along and drag along are not rights found in the Companies Act. They come from the venture capital business, and are common in contracts in the US as well as in Europe (Kaplan and Strömberg, 2003).

The typical drag along provisions allow all share owners with a certain percentage ownership (usually 50 per cent making the VC the only part actually given the rights by the contract) the right to force the other share owners to sell if they receive an offer on their shares that is contingent on the sale of the whole company. Usually the other shareholders have a right of first refusal on the selling investor's shares. However, if the only other part is E, and he is wealth constrained, it is unlikely that he is capable of using his ROFR, which implies that

drag along usually is a mechanism for the VC to force E into selling his shares. The use of drag along provisions is making the company more liquid and provides the VC with an opportunity to get out without the approval of E. This shifts the control right balance in the VC's direction.

When the drag along right is executed, the party selling his shares is forcing his action on the other parties. In the context of the model, we can present the mechanism like this:

Two signals: $\theta = 0$, an external buyer offers to buy shares from a shareholder having a drag along right

$\theta = 1$, no offers made on the shares of the shareholder having a drag along right

Two actions: a_0 : demand that the other shareholders sell their shares

a_1 : not demanding that other shareholders sell their shares

As long as the total payoff is maximized when all shares are sold in the case of a bid, and no shares are sold in the case on no bids, the first best pairs of signals and actions are: $(\theta = 0, a_0)$ and $(\theta = 1, a_1)$. If there is no bids, it does not matter who gets to decide, as there is no possibility of exercising the drag along right anyway. Therefore the easiest and most efficient way to solve this situation is to exclude the drag along right in the case of no bids. To ensure first best action being taken in the case of a bid, the right should then be granted to the party wanting to sell his shares to the external investor contingent upon him receiving the bid.

Examining the contracts, this structure is exactly what we find. As long as there are no bids on the shares of a shareholder owning a certain percentage of the firm (usually 50 per cent), no one has the right to force others to sell. But when the offer is made on the shares of the parties included by the drag along clause, this party is granted the drag along right.

Even if including drag along rights is efficient, it does not necessarily maximize the utility of E. Because he also has a certain private benefit, it might be so that he would prefer other actions to be taken than the ones the VC prefers. Therefore it is wrong to conclude that drag along is neutral what regards the control rights balance, as the VC is sure to have his first best choice, E is not. Therefore also this provision shifts the balance in favor of the VC.

4.3.10 ROFR and tag along

Both ROFR and tag along rights have, as mentioned earlier, been found in every contract in our sample. Unlike drag along, the tag along is granted every shareholder on equal terms. The typical tag along that we have found, states that when a shareholder sells (a portion of) his shares, the other shareholders have the right to sell an equal percentage of their shares to the same buyer at the exact same terms as the first seller. If the buyer is not willing to buy all the shares, the first seller is obliged to buy the specified quantity of shares from the other investors at the same price as he sold his own. This could be very expensive. In some contracts we have found that the tag along rights does not apply to sales made by investors owning less than a certain percent of the total number of shares (usually around 5 per cent). The smallest investors do not have the same obligations as the larger, making their shares more liquid, and also more worth. For the VC it is no danger in excluding them from the tag along clause, as their fractions of shares are too small to cause any significant change to the power balance in the company.

Both ROFR and tag along are mechanisms that can incur two different actions which are easily verifiable; to sell or not to sell. Still our model is not applicable for these mechanisms, because they are not so much about the course of the company as they are about the individual shareholders. When the right of first refusal or the right to tag along is being executed, it does not lead to one party taking actions that affect the company and other parties directly. Both E and the VC decide for themselves if they want to buy newly issued shares, or if they want to co-sell their shares. It is not like closing down the company or firing the management. Therefore the model is unfit for these mechanisms, and there is no reason to expect a contract with contingent control rights to be more efficient when it comes to ROFR and tag along.

It is no problem for the VC that the tag along provision is granted all investors on equal terms. An outside investor wanting to buy his big shareholding is most likely to want to buy the whole company anyway. However, for E (or other smaller investors) it reduces the liquidity, as any buyer must be prepared to offer the same price and conditions to the other investors. So even if it might seem like the tag along provision is protecting all shareholders equally, it is just another mechanism for the VC to strengthen his position on the behalf of E.

ROFR is a neutral provision functioning according to the suggestions in the Companies Act. It is granted all shareholders on equal terms, thus does not affect the power balance.

4.3.11 Staging

According to Kaplan and Strömberg's (2003) findings, we expected to find staging represented in almost all of the contracts where the financing could be split up in two or more portions. And in line with the article of Neher (1999), the renegotiation should take place at a point in time where the negotiation power of E is as small as possible.

Our findings indicate a somewhat less sophisticated use of staging in Norwegian contracts. Staging does frequently occur, but the timing of later financing rounds does not correspond to Neher's (1999) findings.

In a little under half of our sample, we found staging as an explicit mechanism. The maximal amount to be invested and the timing were present in most of these contracts. But instead of locating the renegotiation to the time when E has less renegotiation power contingent on the embodiment of E's human capital, the later financing rounds are in our samples located to a certain time or period contingent on the company's need for more cash. From the VC's point of view, this is not optimal, as there is no guarantee that refinancing occurs right after a part of E's human capital has been embodied in the firm.

Instead of explicitly outlined rules for the later financing, we have found that the granting of an option to supply the company's later capital needs to the VC is commonly used. This option states that the VC has the right of first refusal for all later investments in the company. This applies to issuance of new shares as well as for convertible loans and all other forms of debt increasing actions. The option can have an upper limit (total sum invested) after which all investors have the same right to participate in share issues on equal terms at a pro-rata basis.

The way staging is used in Norway does not provide the VC with the renegotiation power it optimally could have done. By making the later financing rounds contingent on embodiment of the human capital of E, the VC can increase his negotiation power and thereby also shift

the control rights balance in his favor. However, as currently applied, staging as a mechanism does not affect the balance of control noticeably.

4.3.12 Summing up

Summing up the effects the different mechanisms have on the distribution of control rights, we find that the control rights balance is clearly tipped towards the VC. This is as expected, since there is a higher level of moral hazard connected to the actions of E than to the actions of the VC. All mechanisms are working either in favor of the VC or are neutral (not shifting the balance in favor of neither the VC nor E).

Mechanisms working in favor of the VC:

- Board rights
- Redemption rights
- Anti-dilution
- Non-compete and non-solicit
- Tag along
- Drag along
- Vesting / buy back

Neutral mechanisms:

- Voting
- Liquidation preferences
- ROFR

Most of the mechanisms are used optimally (from the VC's perspective) according to the model and related theory. But still there are some mechanisms where we believe that the VC would have an interest in making changes to the contractual structure.

The first mechanism where we can spot a potential for the VC to increase his level of control rights is staging. We believe that by giving the timing of later financing rounds and renegotiation more consideration, the VC should be able to decrease the negotiation power of the E, and thereby not having to pay as much for the desired control rights.

For a more efficient contract regarding the value of E to the company, there could be made some adjustments to the vesting and buy back clauses. As described earlier, there seem to be some inefficiency in the typical use of buy back rights in Norwegian contracts. Depending on the sophistication level of E (whether E fully understands the different incentive effects for the VC from vesting and buy back), including buy back instead of vesting can be expensive for the VC. This extra cost is not necessary unless the VC needs an extra strong grip on E.

5. Conclusion

Throughout the thesis, the main focus has been on finding the optimal contractual structures in venture capital financing. Recall the problem definition: “*Are contractual mechanisms applied in Norwegian venture capital transactions optimal for minimizing agent-principal costs?*” The first part of the thesis approached the problem from a theoretical perspective. We constructed models, based on well recognised academic research studies, which outlined contractual structures leading to the first best solutions in three different scenarios; good, medium and bad.

Most of our findings indicate that the contracts used in the Norwegian venture capital market are to a high extent in line with the studies from the US venture capital market and the applied theory. In general, the observed mechanisms mitigate the double-sided moral hazard problem, however, there are some deviations. It seems that the distribution of cash flow rights is levered towards the VC, due to the fact that the most observed financial claim (full participating preferred share) favours the VC on E’s expense compared to the theoretically optimal claim (recall the comparison of figure 22 and 13). Looking at control rights, we find the same leverage towards the VC. However, this is aligned with the theory, thus does not represent deviations. Still, there are two mechanisms used in a non optimal way referring to the theory. The use of buy back instead of vesting is a deviation from Kaplan and Strömberg’s (2003) analysis of the US venture capital industry, and shifts the control right balance power further in direction of the VC than theory suggests. We also observe that staging is used uncritically by the VC, granting E the right to choose the time of refinancing negotiations, hence an increase in allocated control rights to E.

The respective results from control and cash flow rights cannot be seen independently. The contracts are formed through a negotiation process, thereby both control and cash flow rights are subject to a trade-off. In some situations a deviations in cash flow rights can be offset by a deviation in control rights. As the deviations favour of the VC, there is no reason to assume that a trade off can explain our findings. Note that there is no one to one relationship between control and cash flow rights mechanisms.

Another possible explanation might be that some provisions are complements. I.e.an increase in VC cash flow rights must be followed up by an increase of VC control rights. We believe

that there could exist such a connection between the choice of financial claims and restrictions connected to founder's shares. When full participating preferred shares are chosen, the VC receives a larger fraction of the upside proceeds than assumed theoretically optimal. When the founder's shares are subject to buy back instead of vesting provisions, E's opportunity cost of terminating the employment is larger (recall figure 23), hence demands a smaller fraction of the upside proceeds to remain with the company.

A third explanation is that the theoretical models are not complex enough to cover the issues of the real world. The main objection to our models is the assumption of discreetly distributed signal and state. However, in real life, both signal and state are continuously distributed, and confining them in intervals may increase the chance of misinterpretations and errors.

In this paper, we have found that contractual mechanisms applied in Norwegian venture capital transactions contribute to minimize the agent-principal costs, even though there are some possible areas of improvement. Whether these are real deviations or optimal solutions not covered by the model is still to be explored.

Glossary

This glossary is extracted from an article published by the British Venture Capital Association (BVCA).

Anti-dilution provisions

Provisions which protect the holder's investment from dilution as the result of later issues of shares at a lower price than the investor paid by adjusting the option price or conversion ratio or issuing new shares

Burn rate

The rate at which a company is consuming cash each month.

Capitalize

Converting a debt owed to a company into equity

Completion or closing

In the context of a venture capital investment round, the release of investment funds to the company and the issuance of shares to the investors following execution of the investment documents and verification that all necessary conditions have been fulfilled.

Conversion

The act of exchanging one form of security for another security of the same company, e.g. preferred shares for ordinary shares, debt securities for equity (see paragraph 6, Section IV above).

Conversion ratio

The ratio indicating the number of underlying securities that can be acquired upon exchange of a convertible security, e.g. the number of ordinary shares into which preferred shares are convertible

Convertible debt

A debt obligation of a company which is convertible into shares.

Convertible preferred shares

Preferred shares convertible into ordinary shares.

Co-sale or Tag along rights

A mechanism to ensure that if one investor or founder has an opportunity to sell shares the other shareholders are also given that opportunity on a proportional basis.

Covenants

Undertakings given to the investors by the company and sometimes the founders to do or not do certain acts

Cumulative dividends

A dividend which accumulates if not paid in the period when due and must be paid in full before other dividends are paid on the company's ordinary shares.

Cumulative preferred shares

A form of preferred shares which provides that if one or more dividends is omitted, those dividends accumulate and must be paid in full before other dividends may be paid on the company's ordinary shares

Debt/equity ratio

A measure of a company's leverage, calculated by dividing long-term debt by ordinary shareholders' equity.

Debt financing

Financing by selling notes or other debt instruments.

Deemed liquidation or liquidity event

Term used to describe trigger events for a liquidation preference. Usually defined to cover, among other things, a merger, acquisition, change of control or consolidation of the company, or a sale of all or most of its assets.

Default

Failure to discharge a contractual obligation, e.g. to pay interest or principal on a debt when due.

Dilution

The process by which an investor's percentage holding of shares in a company is reduced by the issuance of new securities

Down round

A round of venture capital financing in which the valuation of the company is less than the previous round.

Drag along/bring along

A mechanism ensuring that if a specified percentage of shareholders agree to sell their shares, they can compel the others to sell ensuring that a prospective purchaser can acquire 100% of a company

Early stage capital

Finance for companies to initiate commercial manufacturing and sales, following receipt of seed capital.

Employee share option plan (ESOP)

A scheme to enable employees to acquire shares in the companies in which they work

Exercise price

The price at which an option or *warrant* can be exercised.

Exit mechanism

Term used to describe the method by which a venture capitalist will eventually sell out of an investment

Follow-on investment round

An additional investment by existing and/or new investors, which may be provided for in documentation relating to the initial investment.

Founder shares

Shares issued to the founders of a company, usually at a low price in comparison to that paid by investors. See also *Sweat equity*.

Full ratchet

Anti-dilution provisions that apply the lowest sale price for any ordinary shares (or equivalents) sold by the company after the issuing of an option or convertible share as being the adjusted option price or conversion price for those options or shares.

Fully diluted share capital

The issued share capital of a company if all options and other rights to subscribe for shares are exercised.

Fully participating

Term sometimes used to describe a liquidation preference which entitles beneficiaries to receive a priority initial fixed payment and share pro rata with other share classes in any remaining proceeds.

Good leaver/bad leaver

A criteria applied to a shareholder employee who is ceasing to be employed to determine whether his shares should be subject to a compulsory sale, and if so, at what price.

Independent or outside director

A non-executive member of the Board of Directors who is not an employee of a company nor affiliated with a controlling shareholder of a company. The definition of independent may be further defined in different countries or markets.

Initial public offering (IPO)

The sale of shares to the public by a company for the first time. Prior to an IPO, companies that sell shares to investors are considered privately held. This is the first time that a company has tried to raise funds on a public market such as a share exchange. Terms used to describe this are flotation, float, going public, listing when a company obtains a quotation on a stock market.

Intangibles

The non-physical assets of a company that have a value, e.g. intellectual property rights including trademarks and *patents*.

Liquidation or winding up

The sale of all of a company's assets, for distribution to creditors and shareholders in order of priority. This may be as a result of the insolvency of the company or by agreement amongst shareholders

Liquidation preference

A negotiated term of a round of venture capital financing that calls for certain investors to have all or most of their entire investment repaid if the company is liquidated. Often also triggered by a deemed liquidation.

Liquidity

Converting an asset (such as shares) to cash.

Listing

When a company's shares are traded on a stock market it is said to be listed.

Lock-up

A provision in the Underwriting Agreement between an investment bank and existing shareholders that prohibits corporate insiders and private equity investors from selling for a certain period of time following a public offering.

Milestone

A contractual target that must be met by the company. Often used by investors as a condition for releasing further amounts of financing.

Ordinary shares

These are equity shares that are entitled to all income and capital after the rights of all other classes of capital and creditors have been satisfied.

Pari passu

Equally, rateably, without preference. Generally used to describe securities which are to be treated as being of equal priority or preference.

Participating preferred shares

Preferred shares which entitle the holder not only to its stated dividend and liquidation preference, but also allows the holder to participate in dividends and liquidating distributions declared on ordinary shares.

Pay to play (Pay or Play)

A provision which requires investors to participate in subsequent rounds or forfeit certain rights such as anti-dilution.

Pre-emption right

The right of an investor to participate in a financing to the extent necessary to ensure that, if exercised, its percentage ownership of the company's securities will remain the same after the financing as it was before. Sometimes also used as a term for a right of first refusal on shares of other investors

Put option

A contract whereby the holder of the option has the right to sell to the grantor shares at a specific price (*strike price*) at some time in the future.

Qualified IPO

An IPO which gives the company a market capitalization of at least a certain amount (often a multiple of the valuation at the time of an investment) and is accompanied by a fully underwritten fund raising of a certain amount

Recapitalization

The reorganization of a company's capital structure by the infusion of new cash and/or the replacement of current shareholders by new ones. Recapitalization can be an alternative exit strategy for venture capitalists.

Ratchets

A structure whereby the eventual equity allocations between the groups of shareholders depend on either the future performance of the company or the rate of return achieved by the venture capital firm. This allows management shareholders to increase their stake if the company performs particularly well.

Redeemable shares

Shares which the company can be made to repurchase or which the company has the right to repurchase at a predetermined value

Right of first refusal (ROFR)

A contractual right, frequently granted to venture capitalists, to purchase shares held by other shareholders before such shares may be sold to a third party

Seed capital

Capital provided to allow a business concept to be developed, perhaps involving the production of a business plan, prototypes and additional research, prior to bringing a product to market and commercial large-scale manufacturing.

Series

A round of venture capital financing. Each sequential round is distinguished by a letter: A, B, C, etc.

Shareholders' Agreement/Investor Rights Agreement

Many of the rights between shareholders in a company are set out in its Articles of Association. This is a public document that is filed at Companies House. In many cases shareholders will want to create rights and obligations between them that they would prefer to keep confidential. In such cases, rather than put those rights and obligations into a public document they will enter into private contractual arrangements, in a document such as a Shareholders' Agreement. If the agreement also includes terms relating to the subscription for shares it will often be referred to as the Investment Agreement

Sweat equity

Equity (shares in a company) which is given to the founder of the company in recognition of the effort (sweat) which he has expended in getting the company started up

Syndication

An arrangement whereby a group of investors come together to invest in an investment proposition which they would not be prepared to consider individually whether because of risk or amount of funding required. There is however usually a lead investor

Trade sale

Sale of a company to another company. As a form of exit, it is an alternative to flotation and more common.

Tranching

Investment made in stages; each stage being dependent on achievement of targets or milestones.

Transfer restrictions

Restriction of the sale of shares by founders, management or investors for a predefined period of time or until certain conditions have been fulfilled.

Vesting

Where an employee or consultant has been granted rights to receive options or has been issued shares which are subject to his completing a specific length of service or achieving certain milestones, the options or shares will have vested when the period or milestone has been satisfied. Once vested the employee or consultant is entitled to exercise those options to obtain shares or to receive full rights to the shares.

Warrant

Another word for an option to purchase a security. The term is generally used for options provided by the company to outside investors (as distinct from officers, employees, etc.).

Weighted average

Anti-dilution provisions that apply a weighted average formula to adjust the option price or conversion ratio of an early-round investor, based on the sale price and number of equivalent shares sold by the company after the issuing of the option or convertible security

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Appendix

Mechanisms in VC contracts		Company A
Check list	X	Comments
Cash flow rights		
1. Type of share		
Preferred		
Full participating		
Simple participating		
Common		
3. Dividend rights		
Cumulative		
Full participating		
Simple participating		
Normal		
Full participating		
Simple participating		
4. Liquidation preference		
Liquidity event		
M&A		
IPO		
Change of control		
Sale of assets		
Trade sale		
5. Redemption		
Conditions		
Period		
6. Conversion		
Rights		
Only exit		
Automatic		
Criteria:		
Qualified IPO		
Other		
7. Anti-dilution		
Full ratchet		
Weighted average		
Mechanism		
Conversion ratio		
Issue shares (nominal)		
Bonus shares		
Warrants		
Payment		

Control rights		
8. Founder shares		
Vesting		
Buy back		
9. Pre-emption rights		
10. ROFR		
Exceptions:		
11. Co-sale and tag-along rights		
Exceptions:		
12. Drag-along or bring-along		
Exceptions:		
13. ESOP		
14. Contingencies		
Financial		
Convertible loan		
Options		
Put		
Call		
15. Non-compete		
16. Non-solicit		
17. Board rights		
Board		
18. Voting rights		
VC rights		
Consent needed		