

HELSINKI SCHOOL OF ECONOMICS (HSE)

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FINANCIAL INSTRUMENTATION MITIGATING AGENCY PROBLEMS.

Tensions between a Business-social Entrepreneur and Venture Capitalists.

Case In Vitro Diagnostics Venture.

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Objectives of the thesis

The research problem of the thesis was to find out whether the agency theory provides ways of using financial instruments to align different interests of a business-social entrepreneur (who strives equally for financial and societal benefits) and a mainstream venture capitalist (who strives primarily for financial benefits). The objective of the theoretic part was firstly to introduce the different financial instruments, potential interest conflicts between such parties and the main features of the agency theory. Secondly, the objective of the theoretic part was to review which financial instruments mitigate the interest conflicts between the parties. The objective of the empiric part was to make a construction of the financial instrumentation that should mitigate the interest conflicts in a case company and to study the practical functioning of the construction based on the reactions and comments by the case entrepreneur and selected venture capitalists.

Source material and research method

In the theoretical part, Finnish and foreign literature, articles, course materials and official references were used as a source material. The research method was constructive and based on the previous research a theoretical construction for the financial instrumentation was made. In the empirical part, discussions with the case entrepreneur and five Finnish venture capitalists were analysed.

Results

The interest conflicts between a business-social entrepreneur and venture capitalists were closely related to a two-way information asymmetry. An extension of the agency theory, the double moral hazard approach, provided theoretical background to this problem and the convertible instruments were seen optimal to mitigate the interest conflicts. The construction made for the financial instrumentation was theoretically possible but not simple and easy to apply. A more pragmatic suggestion for the case venture was made based on the comments received from the case entrepreneur and the selected venture capitalists.

Key words

Entrepreneur, venture capital, financial instruments, interest conflicts, corporate social responsibility, agency theory, double moral hazard

RAHOITUKSEN INSTRUMENTOINTI AGENTTI-ONGELMIEN LIEVENTÄJÄNÄ.

Jännittyneisyydet taloudellis-yhteiskunnallisia hyötyjä korostavan yrittäjän ja pääomasijoittajien välillä.

Case in vitro diagnostiikka –yritys.

Tutkimuksen tavoitteet

Tutkimusongelmana oli selvittää tarjoaako agenttiteoria keinoja käyttää rahoitusinstrumentteja siten, että sekä taloudellisia että yhteiskunnallisia hyötyjä korostavan yrittäjän ja etupäässä taloudelliseen hyötyyn keskittyvän pääomasijoittajien valtavirtaa edustavan sijoittajan eri intressejä voidaan yhdistää.

Teoriaosuuden tavoite oli esitellä ensinnäkin eri rahoitusinstrumentit, mahdollisia eturistiriitoja em. osapuolien välillä ja agenttiteorian pääpiirteet. Teoriaosuuden toinen tavoite oli tarkastella mitkä rahoitusinstrumentit lieventävät osapuolten eturistiriitoja. Empiriaosuuden tavoite oli muodostaa sellainen konstruktio rahoituksen instrumentoinnista, joka lieventäisi eturistiriitoja case-yrityksessä, ja tutkia konstruktion käytännön toimivuutta case-yrittäjän ja valittujen pääomasijoittajien reaktioiden ja kommenttien perusteella.

Lähdeaineisto ja tutkimusmenetelmä

Teoriaosuudessa käytettiin lähdemateriaalina suomalaista ja ulkomaista kirjallisuutta, artikkeleja, kurssimateriaaleja ja virallislähteitä. Tutkimusmenetelmä oli konstrukttiivinen ja aikaisempaan tutkimukseen perustuen tehtiin teoreettinen konstruktio rahoituksen instrumentoinniksi. Empiriaosuudessa analysoitiin keskusteluja, joita käytiin case-yrittäjän ja viiden suomalaisen pääomasijoittajan kanssa.

Tulokset

Taloudellis-yhteiskunnallisia hyötyjä korostavan yrittäjän ja pääomasijoittajien väliset eturistiriidat liittyivät läheisesti kaksipuoliseen informaation epäsymmetriaan. Agenttiteorian jatko, kaksipuolinen moraalikato, tarjosi teoreettisen taustan tälle ongelmalle ja vaihto-oikeuden käsittävät instrumentit nähtiin optimaalisina lieventämään eturistiriitoja. Rahoituksen instrumentointia koskeva konstruktio osoittautui teoreettisesti mahdolliseksi mutta ei yksinkertaiseksi ja helpoksi soveltaa. Käytännöllisempi ehdotus case-yritystä varten tehtiin case-yrittäjältä ja valituilta pääomasijoittajilta saatujen kommenttien perusteella.

Avainsanat

Yrittäjä, pääomasijoittaja, rahoitusinstrumentit, eturistiriidat, yhteiskuntavastuu, agenttiteoria, kaksipuolinen moraalikato

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1 Introduction

1.1 *Venture capital financing and business-social ventures*

A central issue in entrepreneurship is the planning and receiving early stage financing for a new venture. Early stage companies face difficulties in obtaining financing because the venture capital industry has been severely affected by the economic downturn and the burst of technology bubble in 2000-2001. Furthermore, in Europe the early stage funding is scarce because of the lack of sufficient business angel community. (LTT-Tutkimus, 2005, 37, Creating an Innovative Europe, 2006, 23)

Venture capital refers to equity investments made for the seed, start-up or later stage of a business. Venture capitalist is a professional company making such investments alongside management in high-risk companies demonstrating the potential for significant growth. The purpose of a venture capitalist is to achieve a return on invested capital through the development of portfolio companies. Usually the investments are made through closed-end funds and the investment period varies between three to ten years per company. When the portfolio company has been developed successfully the venture capitalist harvests the investment and makes an exit by selling the shares.

Another issue, which is recently of particular interest, is the role of social responsibility in the business. The entrepreneur in the case company to be studied in this thesis strives for so called double bottom line, both for financial and social returns. E-health and the case company's business area, in vitro diagnostics, have been widely recognized being of critical importance and the potential social returns of such venture are massive. As noted in the recent expert group report nominated by the European Commission, huge savings can be made by digitising diagnostic tests so that results are available to clinicians immediately and unacceptable delays in processing patients can be avoided. However, within mainstream venture capital industry the social return considerations are usually subordinated to the object of achieving financial returns on investments. This creates an interesting issue of potential goal conflict between a business-social entrepreneur and a mainstream venture capitalist. (Creating an Innovative Europe, 2006, 10-11)

A social entrepreneur refers to an entrepreneur who assesses the success of the business primarily in terms of its impact on society. The term **business-social entrepreneur (BS-entrepreneur)** will be used here in order to stress that the entrepreneur strives not only to social but equally to financial targets.

Corporate social responsibility (CSR) is a concept, which has no uniform definition, and it includes a wide area of different activities by companies. The European Commission (2002) has defined CSR as a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis. Commonly CSR is seen to be based on three parts: economic, environmental and social parts. The economic responsibility can be indicated, for instance, through the monetary flows between the company and its stakeholders, benefits by innovations and ability to attract investments into local community. Environmental performance means e.g. decreasing the pollution output, saving energy and using the transport systems more efficient. Social activities are perhaps the widest area including aspects like decent labour practices and working conditions, ensuring human rights of employees, producing benefits into society such as political contributions or improving the competition and lowering consumer prices as well as taking care of the product safety and respecting the privacy, to name some examples. (GRI 2002, 46-56)

It is worth noting that beyond mainstream venture capitalists there are also so called ethical investors and socially responsible venture capital funds, which do emphasize social aspects in their investment decisions. These may be strategically the most suitable investors for the entrepreneur because they share the goal of social benefits. Also business angels and corporate ventures may have flexible investment criteria and may support ventures striving for double bottom line. Socially responsible investors emerged first in the 1960s. At that time the function was to exclude certain industries or corporations which activities were not morally or politically sound, e.g. selling tobacco or military weapons. Later on the strategies have changed to positive screening i.e. finding portfolio companies with CSR activities. Such socially responsible investors will not be subject of this thesis.

The background phenomenon of this thesis is the relationship between an entrepreneur and a venture capital financier, and especially the potential goal conflict between a business-social entrepreneur and a mainstream venture capitalist.

The goal conflicts have been extensively studied through the concept of agency relationship. Agency relationship has been defined as a contract whereby a principal (venture capitalist) engages another person, the agent (entrepreneur) to perform some service on the principal's behalf. A conflict of interest is unavoidable in every agency relationship. It has been suggested that the goal conflicts between the entrepreneur and a financier can be mitigated by correct planning of the use of financial instruments. Financial contracting theories can be divided generally in three classes: (1) classical principal-agent theories,

(2) control theories and (3) debt theories. In addition to these general theories there are also a number of studies, which focus specifically on venture capital financing. **The target phenomenon of this thesis is the agency relationship and the mitigation of interest conflicts by appropriate planning of financial instruments.**

A central topic in the relationship between an entrepreneur and an investor is the information asymmetry. The entrepreneur has often better knowledge of the quality of the venture than the investor. The investor may, however, also have superior information e.g. about the commercialization of the business concept. In the presence of information asymmetry there arises moral hazard and agency cost problems. Moral hazard means that the other party can act opportunistic in a company so that the other party does not find it out. The problem is generally suggested to be resolved by contracts and monitoring which, however, create so called agency costs. Many of the studies regarding the agency relationship concentrate on the opportunistic behaviour of the entrepreneur and the control mechanisms by venture capitalists (e.g. Sahlman 1990, Aghion&Bolton 1992, Hart 1995). In certain theoretical papers the entrepreneur-VC relationship is modelled as double moral-hazard problem. Double moral hazard means a situation where both the entrepreneur and the investor need to put their effort into the venture and both parties may behave opportunistic. (Kaplan & Strömberg 2003, 295, 306, LTT-tutkimus Oy, 2005, 3-5)

Interest conflicts and opportunistic behavior by both parties may happen when a business-social entrepreneur is openly striving for both social and economic targets whereas the venture capitalist ignores the social goal. Double moral hazard is present because both the entrepreneur's and VC's efforts are needed for the success of the venture. The VC does not know whether the entrepreneur will emphasize the social targets at the cost of financial targets and the entrepreneur does not know whether the investor shall strive for the financial targets in a way, which enables also the creation of social returns. As far as the author is aware, there are no studies on how financial instruments should be used in order to align the interests between a business-social entrepreneur seeking for double bottom line and a venture capitalist striving only for financial bottom line. **The research gap to be studied in this thesis is how financial instruments should be used in order to align the interests between a business-social entrepreneur and a mainstream venture capitalist.** The set-up of the research problem is summarized in figure 1 below.

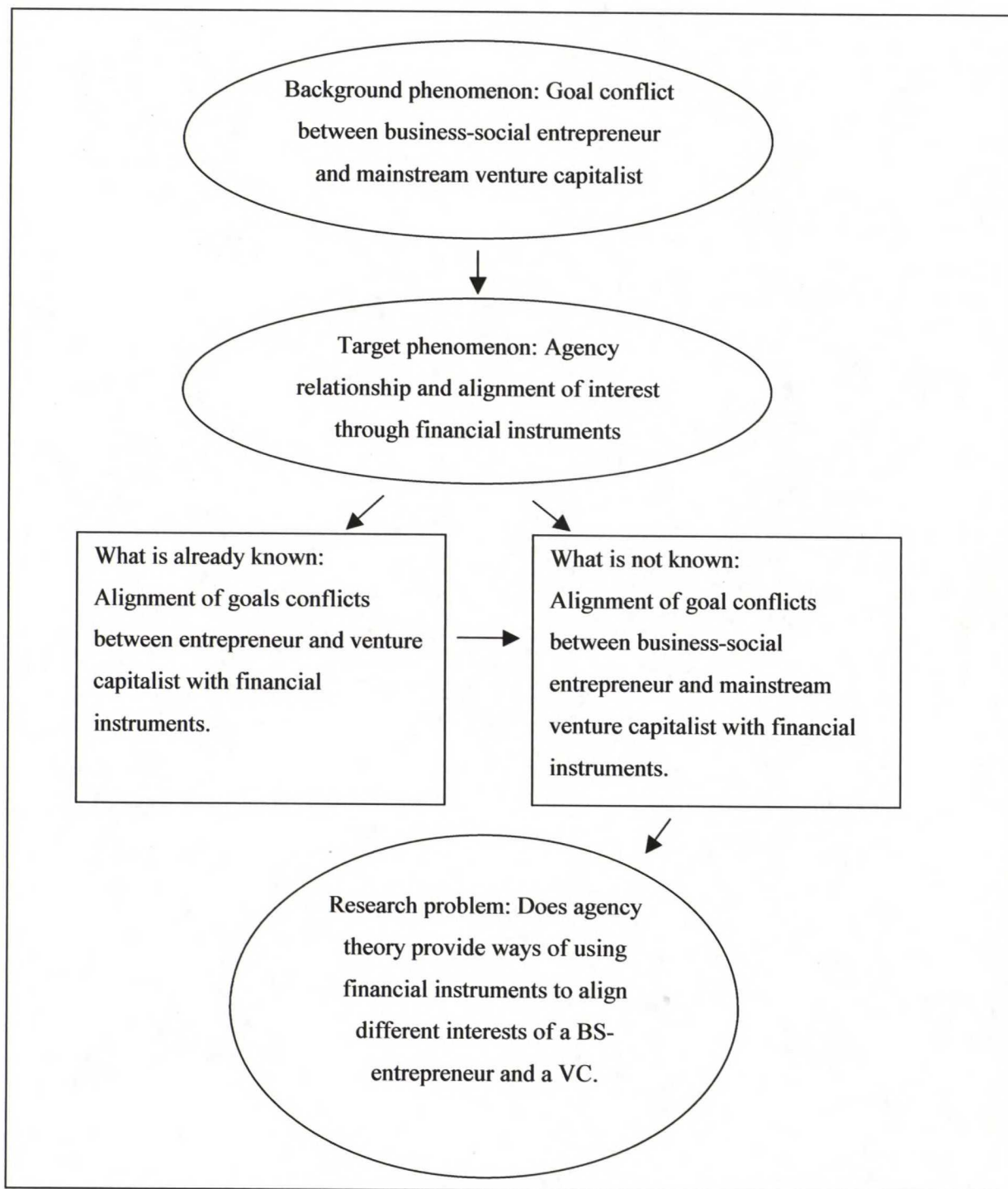


Figure 1: Set-up of the research problem

1.2 Research questions

As introduced above the target phenomenon of the thesis will be the agency relationship between an entrepreneur and a venture capital financier, the interest conflict between a **business-social entrepreneur (BS-entrepreneur)** and a **mainstream venture capitalist (VC)** and how financial instruments could be used in order to mitigate such interest conflicts. The theoretical framework of the thesis will be based on the agency theory. **The research problem is to find out whether the agency theory provides ways of using financial instruments to align different interests of a BS-entrepreneur and a VC.**

The research questions to be handled in the theoretic part of the thesis are:

- 1) **does agency theory provide solution to the alignment of interest conflicts between BS-entrepreneur and VC and**
- 2) **which financial instruments mitigate BS-entrepreneur-VC interest conflicts.**

The empiric part of the thesis studies the planning of appropriate financial instruments for a case company. The subject is limited so that only external financing provided by VCs will be studied. The case company is an early stage high-tech venture with an innovative pilot product in the field of medical diagnostics. The company has significant growth potential since there are global markets for the product. The product represents so called disruptive technology which penetrates the current diagnostics industry with a cheaper, better and more convenient system. Remarkable social benefits will arise automatically from the business of the case company: healthcare costs will be decreased and the patient treatment will be improved, in developing countries the patient access to treatment will increase. The case entrepreneur's goal is to guarantee the social benefits as globally as possible and to keep the business as a going concern in a long-term perspective.

The research questions to be handled in the empiric part of the thesis are:

- 1) **what is the instrumentation to be suggested for the case company aligning the different interests of BS-entrepreneur and VC and**
- 2) **which of the alternative instruments in the construction do the case entrepreneur and selected VCs prefer.**

1.3 Method and structure of the study

The method of the thesis is constructive method. Constructive suggestion to the research problem will be provided based on the previous research on the agency theory and knowledge about the financial instruments and corporate social responsibility. The research problem has practical relevance and the perspective of the

study is originally the entrepreneur's view but the solution needs to be acceptable and appealing also to the VC. The practical functioning of the construction and preferences of the parties will be reviewed with the help of comments from the case entrepreneur and selected VCs.

After this introductory part the theoretical approach of this thesis will be presented in Section 2. It is divided into three main parts: financial instruments, goal conflicts between BS-entrepreneur and VC and review of the agency theory. In Section 3 the case company is introduced and the instrumentation including three different alternatives for the financial instrumentation, which should align the different interests of BS-entrepreneur and VC, will be constructed. The target is to find a general model for the financial instruments. The actual functioning of the construction and the preferences of the case entrepreneur and five different VCs will be presented, analysed and summarized and suggestions for the case venture will be made. Section 4 concludes the study. The relation to the previous research, the scientific relevance of the construction and the implications for further research will be discussed.

The theoretical framework of the thesis is described in figure 2 below.

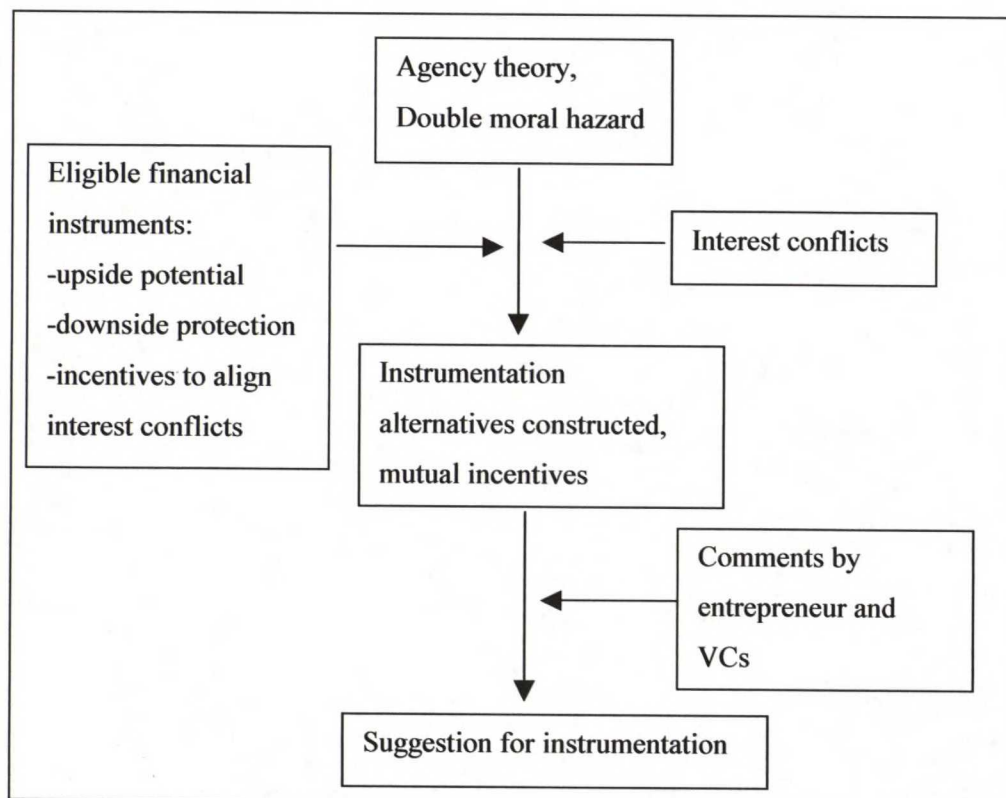


Figure 2: Theoretical framework

2 Theoretical Approach

2.1 Financial Instruments

2.1.1 General

The basic choices of instrumentation are equity, mezzanine and debt financing. Equity means ownership interest in a corporation, represented by the shares of stock. Risk in equity financing is high and it has the last preference in bankruptcy situation. The lower security is compensated with higher potential returns. Mezzanine financing has characteristics of both equity and debt. In pure debt financing the risks and returns are low but the preference in bankruptcy is first. (FVCA Yearbook 2005, 55)

Even though the classification into equity, mezzanine and debt financing is common, it is more informative to study the financial instruments based on their characteristics. It is, however, impossible to describe all financial instruments as there are almost endless number of variations and new forms are being developed all the time (Lauriala 2004, 5). Most of the instruments can be freely modified due to the freedom of contract. Several covenants can be added to the instruments and this will make the actual difference. These relate, for example, to the time perspective, payback provisions, interest, pledges, tradability, ear-marking, option rights, administrative rights, preference if the company is dissolved and to tax aspects (Leppiniemi 2005, 74-75). Moreover, shareholders' agreements are always used in completion to the financial instruments. In shareholders' agreements the parties agree on control rights and different covenants related to i.a. liquidation preference and exit provisions. The new **Finnish Companies Act (FCA)**, which has been reformed as from 1 September 2006, increases the operating freedom of companies and thus it will increase the alternatives available for structuring financial instruments. The new system aiming at flexibility may lead to a situation whereby more and more covenants, which are now only contractually binding, can be included in the by-laws of the company. Through the by-laws such provisions become public and their enforcement is possible in accordance with corporate law. The private agreements between shareholders remain, however, also necessary. (GP 109/2005, 16-17, 212, Alanko 2006)

Figure 3 shows how the most common instruments can be listed in the order where the instruments with the highest risk and profit are on the top of the list and the instruments with lowest risk and profit at the bottom of the list. The list shows also how instruments are usually categorized into equity, mezzanine and debt instruments.

Capital group	Examples of instruments
Equity -highest risk, highest profit	Ordinary shares Different share classes: -voting rights -dividend rights -liquidation preference (distributive share, fixed share, redemption condition)
Mezzanine	-convertible share Option rights Capital loan Convertible loan Loan with profit interest
Debt -lowest risk, lowest profit	Debt with last preference Perpetual debt Debt with covenants Long-term debt Short-term debt

(Modified from Villa 2001, 10-12 and Leppiniemi 2005, 104-109)

Figure 3: Common financial instruments

In the first investment rounds VCs use usually equity and mezzanine instruments. Debt instruments may be used if combined with equity. Most common equity and mezzanine instruments will be presented in more detail in the following. Pure debt instruments have been left outside the presentation.

2.1.2 Shares

The presumption in the legislation is that all the shares of a limited company are ordinary shares, which entitle their holders to equal rights in the company. The key feature of shares is a right to decide in matters handled at the General Meeting of Shareholders including the right to decide on the profits. On the other side the shareholders have the biggest risk on losses. It is possible that shares differ from each other either with regard to the voting rights or rights to the profit (dividend) or to the share of assets in the dissolution or bankruptcy of the company (liquidation preference), if so stipulated in the by-laws of a company. A share may further be convertible from one share class into another as set forth in the by-laws. Share with multiple votes carries by definition multiple votes in accordance with the Articles of Association whereas common share carries one vote in all matters. A share may entitle to a specific financial benefit upon distribution of

the assets of a company. A distributive benefit can be, for instance, $x\%$ better dividend or better return of capital than for other shares. A fixed benefit, in turn, is not related to the financial outcome of a company and can be, for instance, a certain amount of euros or a fixed interest to the nominal value of the share or, for instance, Euribor + $x\%$. The term "preferred share" referring to a share which carries a right to vote only in certain matters and which entitle to such a specific financial benefit is not used any more in the reformed Finnish Companies Act. The usability of such instrument through different share classes continues, however. A share subject to a redemption right means a special share class, which entitles the owner of the share to require that the company shall under specified circumstances buy the shares back at a specified price. A redemption condition and a fixed benefit makes the position of such shares very close to debt financing and diminishes the risk of the investor. (FCA 3:3, Kyläkallio et al., 2002, 231-232)

In the FCA the par value of shares has been abolished. It means that there is no connection between a share and the share capital and companies can issue new shares without altering share capital. A share issue without payment is thus possible. Practical examples for using this possibility are e.g. bonus shares and share split. Bonus shares are used as an incentive instrument provided to the key personnel of a company through which the shareholders get the management of a company being interested in the share price of the company. Issuing such bonus shares is allowed without the right of pre-emption by prior shareholders. Furthermore, investments into the equity without issuing shares is possible. There is no limitation for voting power differences between different share classes and shares can be transformed into other classes also in other ratios than 1:1. According to the new Finnish Companies Act the invested equity can be entered into the distributable equity of the company instead of the restricted share capital. This means that profit funds and invested equity are kept separate and this will facilitate the repayment of capital. Capital repayments are used e.g. in situations of downward adjustment of the share price or repurchase or redemption of shares. (GP 109/2005, 21-24, FCA 3:1-5)

2.1.3 Option right, convertible loan and option loan

Option right means a special right to subscribe new shares against a payment. As a separate right it is an equity instrument meaning a special subscription right to a new share issue. The subscription price is specified and valid during a certain period. Usually such period is several years. Technically, instead of an option right a regular share issue can be used because the subscription time of a regular share issue can be up to five years. (GP 109/2005, 113, FCA 10:1)

In the FCA a convertible loan is defined through the option right; a convertible loan is an option right provided to a debtor of a company where the option right is connected to a debt agreement so that the subscription price of new shares will be paid off against the debt. The debtor has a right to convert all or part of the debt to shares and the debt will be paid off as the payment of shares. The loan interest and maturity

time is specified and in case the debtor will not use his conversion right the company shall pay the debt back. According to the FCA it is also possible to agree on a mandatory convertible meaning a convertible loan with an obligation to convert the loan into shares at certain time or when certain triggers have been met. (GP 109/2005, 113, FCA 10:1.2)

In convertible loan the loan agreement is inseparable from the option right. Option loan, in turn, means an option right to a new share issue in connection with debt financing but the loan agreement can be separated from the option right. Accordingly, when such option right is used the new share issue will be paid separately and the loan is not paid off but it will be repaid. (Puttonen, Valtonen 1996, 42)

2.1.4 Capital loan

Capital loan is a widely used financial instrument which structure is based on Finnish Companies Act. Its nature is originally close to debt financing. Capital loan means a loan, which capital and interest may be paid subordinated to all the other debts upon the dissolution or bankruptcy of the company and the capital and interest may be otherwise paid only if the restricted equity is fully covered thereafter. Any amendments of the terms of the loan in contrary to Finnish Companies Act 12:1 are void. According to the opinion of the Finnish Accounting Board (1787/24.10.2006) operating under the Ministry of Trade and Industry the capital loan will be entered as a separate item into the debt of a company's balance sheet. (FCA 12:1-2, GP 109/2005, 120-122)

The term "subordinated loan" used in Anglosaxon jurisdiction has not been used in this thesis. Subordinated loan is defined as loans, which are repaid upon dissolution or bankruptcy after all other creditors have been paid but before shareholders. The term "capital loan" refers to the instrument which basis is specially set forth in the Finnish Companies Act. Capital loan can be seen as a special group of loan belonging to the subordinated loans. In addition to the subordination the capital loan includes special conditions regarding the payment of the capital and interest as mentioned above. (Villa 1997, 186)

Capital loan does not entitle to any shareholder rights and not to the profit of the company. It has been commonly used in later financing rounds combined with other instruments, e.g. when the investors already have instruments (shares or others) entitling to the profit of the company and the investee company needs further financing to develop its business. Previously capital loans have been mostly used to strengthen the capital structure in order to avoid the mandatory liquidation. The relevance of capital loan may diminish somewhat as the new Finnish Companies Act has abolished the provisions on mandatory liquidation when the equity is less than half of the share capital. However, capital loan remains probably still widely used as it

can be used in order to avoid the registry notification due to a negative equity in accordance with the Finnish Companies Act 20:23.2. Furthermore, capital loan is based on legislation and its structure is therefore easy to understand. It is easy for investors to trust that the capital loan will effectively strengthen the financial position of the company. Using capital loans allows also the VC in principle to require higher interest because the liquidation preference is lower than with convertible loan. In the future the debt side of combined equity-debt instruments may be either capital loans or agreement based subordinated loans. (Alanko, Rasinaho 2005, GP 109/2005, 120, FCA 20:23.2)

2.1.5 Loan with profit interest

Loan with profit interest means a loan with a covenant providing an interest, which is dependable on the profitability of the company. When the company turns profitable the debtor will get a higher interest, which balances the high initial credit risk. The interest can be defined in many ways but it is always connected to the profitability of the company. Profit interest covenant can also be combined with other loan agreements. If this instrument is used by a shareholder of a company together with a capital loan there is a risk that the tax authority may consider the arrangement as hidden distribution of profits. (Villa, 1995, 233-239)

2.2 Interest conflicts

In the following the interest conflict between a BS-entrepreneur and a VC will be reviewed starting from the background phenomenon, double bottom line in Section 2.2.1. This will include a general review of the VC's standpoint, discussion of the purpose of a firm as well as different approaches and critics on CSR in Section 2.2.2. In Sections 2.2.3 and 2.2.4 the interest conflicts between the VC and BS-entrepreneur will be analysed during the investment period and at the exit.

2.2.1 Double bottom line

The first reaction of venture capitalists to social entrepreneurship is usually extremely restrained. This may be because the social responsibility has no uniform concept and it includes a wide area of different activities by companies. Traditionally CSR has been a philanthropy additional to core business activities. Today it is more often seen as one dimension of corporate strategy. VC's own perspective is close to the critical view on CSR, which claims that a profitable company will always generate benefits to the society in addition to the profits to the shareholders. Furthermore, VC's perspective on CSR should be analysed in two dimensions: activities by VC itself and activities by the portfolio companies. VC industry has shown in international surveys that private equity investments have positive effect on the economy and employment; VCs create opportunities for development through finance and strategic expertise. In relation to the CSR activities in the portfolio companies VC's approach is reflected during the whole deal flow from the investment decision

through ownership guidance and exit strategies. An example for a common very broad and vague VC strategy today with respect to CSR can be seen in the annual report by a listed Finnish private equity company: "The point of departure for CapMan's investment professionals in making portfolio companies is that the company complies with prevailing laws and guidelines, as well as generally approved, socially and environmentally sustainable business and corporate governance principles." It is also interesting that CapMan highlights the social benefits in connection with its Life Science fund: "Global commercialisation of the products would mean substantial savings to society and would improve the quality of life directly or indirectly for many people. (CapMan, 2006, 29, 55)

The prevailing view of the theory of the firm is the neoclassical construal of the firm as a nexus of contract and the primary purpose of the firm is to maximize the wealth for shareholders (Margolis&Walsh, 2003, 271). The presumption according to the Finnish Companies Act is also that the purpose of the company is the bringing of profit to the shareholders (FCA 1:5). The Government's proposal for the legislation explains that even if the target of a company is to create profits the perspective needs to be long-term perspective so that investments can be reasoned. Investments enable to bring more profits, which in turn raises the value of the company, which will be shown in the markets as a raising share price. The Government's proposal also specifically states that bringing profits in the long run and raising the value of the share does often require certain ways of behaviour accepted by the society even if there is no mandatory legislation. It is in line with the purpose of bringing profits to engage in corporate philanthropy related to the activities of the company. According to the Governments proposal the profit making should be evaluated based on the effect of different activities together. (GP 109/2005, 38-39)

The European Commission has laid down a wider perspective of the main function of a company. Accordingly, the main function of a company is to create value through producing goods and services that society demands, thereby generating profit for its owners as well as welfare for society. The horizon of business activity is gradually changing from short-term to long-term due to new social and market pressures. The Commission claims that there is growing recognition among companies that sustainable business success and shareholder value cannot be achieved solely through maximising short-term profits but through increasing competitiveness and economic growth in a way which promotes social responsibility. (COM 2002, 5)

2.2.2 Different approaches on CSR

Instrumental theories see CSR as a tool to achieve economic objectives. According to instrumental approach all social investments which produce an increase of the shareholder value should be made. The focus is on corporate decision-making. (Garriga&Melé 2004, 53-54) Some advocates of CSR believe that behaving ethically has a market value through reputation. It has been claimed that the stakeholders' have an influence

on the company's value and the customers will soon find out and boycott if a company behaves unethically. A good reputation is also essential in co-operation with other companies. (Aula&Mantere 2005, 19-20, 40-47)

A rising approach for the instrumental competitive advantages strategies is so called **bottom-of-pyramid (BOP)** strategy. At the bottom of the world's economic pyramid in developing countries around the world are 4 000 million consumers. The business activities in the BOP markets will improve the social and economic conditions at the bottom of the economic pyramid and more importantly such business can be very profitable. The strategy is claimed to be specifically applicable for disruptive products, which can be better introduced among non-traditional customers. After a disruptive product has first received a strong position at BOP markets it is time to launch an upmarket attack on middle-class and upper end markets of the economic pyramid and compete with the industry giants. (Christensen et al, 2001, 81, Garriga & Melé 2004, 54-55, Hansen, 2005, 7-10)

Disruptive products are typically technologically simple, less costly and allow less-skilled people to do things previously done only by expensive specialists in centralized locations. Furthermore, disruptive products are often ignored by industry leaders since they would destroy and replace the existing business because the disruptive products are cheaper, better and more convenient. It is very challenging to build the markets for disruptive products in developed countries because the industry leaders have so strong position.

Prahalad (2005) reports about several case ventures, which have applied the BOP strategy in practise. One of them is a social venture called Voxiva which was launched in Peru and its target was to promote public health by controlling the threat of infectious diseases such as AIDS, SARS, cholera, meningococcal disease and measles. Voxiva's technology was developed for the developing world and utilized the existing telecom infrastructure whereby a cost-effective real-time collection of critical information, rapid analysis and feedback back to the field created an effective system for disease surveillance. Although Voxiva's system was initially developed to support disease response, it is fundamentally universal and applicable to a range of problems. In this business-social venture the founder of Voxiva has realized that the company should balance its social vision with a clear mandate to create strong profits for investors. Voxiva is an example of a successful social venture which has reached its social targets through the support of the powerful economic model leveraging Voxiva's technology. Furthermore, in accordance with the BOP approach referred to above, Voxiva's simple and practical technology developed initially for the developing world has also created demand in the developed world, e.g. in the USA. (Prahalad 2005, 361-378)

When the social investments are close to the company's strategy they create greater wealth and increase the competitiveness of the company (Garriga&Melé 2004, 53-54). To certain businesses CSR activities are

linked by definition. For example within industries manufacturing instruments for pollution abatement or other ecological innovations like wind turbines for the generation of electricity the sustainability principles are already embedded in the products and in the business concepts (Randjelovic et al., 2003, 243, 247). **The debate about whether there is a business case of CSR or not is not relevant in companies in which the social benefits follow automatically from the business itself.** These businesses are appealing investments also to mainstream VCs, provided that the business has otherwise the profit opportunities VCs look after. As Porter and Kramer (2002, 2006) have noted, the more a social improvement relates to a company's business, the more it leads to economic benefit as well. CSR can provide a competitive advantage when it is integrated into the strategy of a company. According to Porter and Kramer the society and companies must stop thinking in terms of CSR and start thinking in terms of corporate social integration (Porter & Kramer 2006, 92).

Many theories on CSR rely ultimately on normative arguments expressing moral or philosophical guidelines for the management. Political and ethical approaches to CSR are close to each other in a sense that they both emphasize the moral responsibilities of a company. Political theories on CSR focus on a responsible use of business power in the political arena. Corporate citizenship is a well-known approach of political theories. Corporate citizenship means that the company is understood as being like a citizen which should accept social duties in the community. Ethical theories emphasize the importance of doing the right things to achieve a good society. For instance, the sustainable development approach aims at achieving development which take into account the present and future generations. (Garriga&Melé 2004, 63-64)

A stakeholder theory has been explained in many different ways. Generally, it means balancing the interests of the stakeholders of the firm like employees, customers, suppliers and communities with the interests of the shareholders. There can be seen three aspects of the theory which are descriptive, instrumental and normative. Many studies suggest an instrumental view whereby the adherence to the stakeholder principles leads to better, or at least equal, corporate performance as a mere shareholder view. Freeman (1984) explains the stakeholder approach through the change of external business environment, which compels the management to take into account the groups who can affect or be affected by the company. There is no compelling evidence justifying the descriptive and instrumental approaches of the stakeholder theory. (Donalson & Preston 1995, 66-88, Freeman 1984, 49, 246-247)

There are three kinds of different arguments in economics claiming that the CSR involvement is misguided. The first one states that the social welfare is maximized through the maximization of shareholder wealth. This means that the companies should not have any challenge at all to invest in social initiatives. Anshen (1980) points out that there is a general agreement of that the pursuit of economic goals inevitably generates a variety of social effect and that the business system has always served both economic and social ends. According to him it is inaccurate to speak about social responsibility that is inconsistent with the long-run

economic interests of the shareholders in a private company. (Anshen, 26-39) According to the second type of criticisms, it is the task of governments or other public agencies to handle the societal problems.

Friedman's (1970) well-known view of the moral responsibilities of a company represents this second type of criticism. In Friedman's view the only social responsibility of a company can be to increase the shareholder's profits (Friedman 1970). The third form of criticism suggests that CSR actions can be reasonably only in case they will be openly disclosed to all parties and the parties decide to participate in the venture despite such actions. In this case the market success will in any case sort out whether the CSR is the best use of a firm's resources. (Margolis&Walsh, 2003, 270-272)

Between 1972 and 2002, more than 120 academic studies (e.g. Anderson&Frankle 1980, Belkaoui 1976, Blacconiere&Northcut 1997, Bowman 1976, Bragdon&Karash 2002, Brown 1998, Christmann 2000) have been completed about the relationship between social responsibility and financial profits. The target for many of these studies is to legitimate the firm's ethical role being equal, not subordinated, to its financial performance. In a meta-analysis made by Margolis and Walsh (2003) almost half of the results pointed to a positive relationship between corporate social and financial performance. The findings are not, however, clear because there are no standard metrics for corporate social performance, different metrics are applicable to different cultural contexts and there are concerns about the reliability and validity of the measures. It is notable that there is little evidence either that behaving responsibly makes the company less profitable. It is thus possible to commit resources to social responsibility without losing competitiveness and it has been shown that for some companies in special circumstances it does make business sense (Carriga&Melé 2004, 53, Vogel 2005).

2.2.3 Interest conflict during investment period

Here the analysis will be limited to ventures in which the social benefits follow automatically from the core business itself. In these cases the social dimension is indistinguishable part of the business and the debate about whether there is a business case of CSR or is not relevant. This means that the entrepreneur should not need to have to justify to the VC the strategy for aiming at social benefits as such; the venture is appealing to venture capitalists due to the financial potential and growth opportunities. Based on this, it seems that there would be no interest conflicts between the BS-entrepreneur and the VC in achieving the double bottom line. Increase in the case venture's business operations should lead automatically both to increase of financial gain and social benefits.

The parties may, however, have different opinions about the business strategy, which may affect the emergence of social advantages. The different perspectives of a VC and the entrepreneur originate from the different time horizons: the entrepreneur has a long-term perspective (over ten years) whereas the VC has

mid-term perspective (three to ten years). Accordingly, the possible interest conflicts relate to the chosen strategic dimensions during the investment period.

The entrepreneur's goal is to launch the product as widely as possible and not to grant the business partners any exclusivity rights. Ultimately the target markets of a BS-entrepreneur are global because the wider the markets are the wider the social benefits are. From the entrepreneur's perspective the BOP approach introduced above seems to be idealistic when the business is based on disruptive innovation. There are billions of customers who may join the specific markets for the first time and there are biggest growth options upmarket to the developed countries. Starting at the top tier of the market would mean for the entrepreneur that in the long run there does not exist enough volume to sustain growth. In Japan, for example, certain leading companies have once succeeded in the disruptive businesses but today they have exhausted the growth options at the high end of their markets. (Christensen et al. 2001, 85-92)

The VC may prefer to stay in advanced markets and to grant exclusive rights with higher profit margins if it brings enough growth during the mid-term investment period. Furthermore, the BOP markets may not seem attractive to a VC because they are often remote and unknown for the investor. In addition, the traditional business metrics of VCs is focused on high gross margins whereas in BOP markets the bottom line is achieved through volumes. (Prahalad, Hammond, 2002, 50, 55) Even though VCs know that economic growth is tied to the creation of new growth markets they might prefer the markets of the developed countries only because VCs time horizon is shorter. (Christensen et al. 2001, 85-91)

At the end of the day, the parties need to find in any case a mutual understanding of the business plan before any investment will be made. The definition of performance objectives in specific terms is pivotal for building a lasting and communicative relationship with the investors. When the same performance metric used for financial targets indicates also the social value the entrepreneur does not need to "sell" the social goals to the investor. The social benefits are very complicated to be measured directly but metrics, which have a positive relation to the social impacts, can be found. First it needs to be understood how the benefits to society are created in each specific case and which measurable variables indicate it. To find an appropriate single metric, such as volume of sales or number of users, for both the social and financial targets is the starting point for creating value in both dimensions. The social targets will not be emphasized at the cost of disruption/financial targets as long as the chosen single performance variable has a strong positive relation to the both targets. The social part of the double bottom line forms as a "side-effect" and the parties shall have a single performance target without interest conflicts. It should be kept in mind, however, that even if the business plan had been favourable to the double bottom line in the beginning there is no guarantee that the plan would or could be strictly followed during the investment period. (Harjula 2007, 11-12)

2.2.4 Interest conflict at exit

The other interest conflict between a BS-entrepreneur and a VC relates to the question what happens to the business when the VC exits the investment. VCs make their investments usually through closed-end funds. The economic life of most funds is set at ten years. Typically during the first four years the investee companies are searched and selected and during the last six years the exits are made to realize the investments. An early stage investment may take 7 to 10 years to mature for exit and later stage investments may take only a few years. According to the survey conducted by EVCA approximately 70 % of the respondents reported that the planned duration of the venture capital investment was 2 to 5 years. (Sahlman 1990, 490, Geringer 2005, EVCA 2002, 11)

Both the VC and entrepreneur as owners of the company benefit from the high pricing of shares at the exit. In addition to profit maximization, the management are motivated by the values and norms of their professions or organizations (Oviatt 1988, 220). Donaldson and Lorsch (1983) found that the primary interest of the top management of a company is not the maximization of the shareholders' wealth but the long-term survival of the corporation. The management is therefore foremost committed to maximize the corporate wealth including the human assets and the competitive position in the markets. The exit situation represents a hostile discontinuity as new investors come into the picture with new investment standards and objectives. (Donaldson & Lorsch 1983, 7, 133)

VC industry has acknowledged that getting the support of management for the exit is critical as the management of the company is often found to be an obstacle to a profitable exit. Therefore detailed exit arrangements with the management team is usually made already at the time of the investment decision. The exit is usually contractually arranged with the management team and the entrepreneur already at the time of the investment decision. According to the EVCA's survey only less than 7 % of the respondents said that no specific time-scale to exit of venture capital investment was planned. VCs invest only if they have guaranteed exit possibilities and the entrepreneur may have little negotiation power at the time of seeking financing. From the entrepreneur's view this is problematic as the VCs see the rate of return as the most important factor in the exit. Only some passive VCs have considered also the future of the company and the satisfaction of the entrepreneur. (EVCA, 1997, 4-15, 2002, 11)

The BS-entrepreneur wishes that the exit will not endanger the social benefits of the venture. The entrepreneur is ready for the exit when the innovation has gained the critical mass needed for keeping it alive. Also the VCs' exit possibilities will improve after this stage because the innovation has gained acceptability and shown its potential and there will be more buyer candidates. The concern for the entrepreneur is a premature exit of the venture capitalist. It may happen through a hostile acquisition by an industry leader who is interested only to hold the patents and there is no guarantee that the business will be

continued. It is commonly acknowledged that there is a real threat of hostile acquisition by outside firms but it has also been argued that this should work as an incentive for the management to act in the shareholders' interest by maintaining a high share value (Oviatt 1988, 221). Notwithstanding, the giant industry leaders are financially very powerful and able to pay even a high price in order to maintain their competitiveness by acquiring rights to the new technology. The entrepreneur's target is that the case innovation will receive during the venture capitalist's investment period a market position, critical mass of users, which will ensure that the innovation will stay alive also after exit of the investor. The venture capitalist is interested primarily only in the financial profits at the exit situation.

VCs are not willing to accept covenants, which limit the exit possibilities. The entrepreneur could, however, try to negotiate a covenant setting forth an initial period during which the investor is prevented from making the exit and during which the critical mass can be reached. The presumption is here that if the critical mass has been reached during the investment period there should not be further interest conflicts at the exit. Thereby the possible interest conflict at the exit situation can be prevented during the investment period.

2.3 Agency theory

2.3.1 Introduction to agency theory

Financial contracting theories can be divided generally in three classes: (1) classical principal-agent theories, (2) control theories and (3) debt theories (Kaplan & Strömberg 2003, 295). The most famous paper regarding the modern corporate finance is the theorem presented by Modigliani & Miller (1958) according to which the way a project or firm is financed doesn't matter in an ideal world where there are no taxes or agency or information problems (Modigliani & Miller 1958, 292). The main finding in the literature on the agency problem is contrary to the Modigliani & Miller theory; the value of a project or a firm depends on the actions of the management and the best way to handle it is to provide optimal incentives to the agent. (Hart 2001, 1079-1082)

Jensen & Meckling (1976) have written the most famous paper regarding the agency problem. They define the firm as a nexus of contracting relationships among individuals and the agency relationship as a contract whereby a principal (the VC) engages another person, the agent (the entrepreneur), to perform some service on the principal's behalf. It involves also delegating some decision making power to the agent. A conflict of interests is unavoidable in every agency relationship. This is because the both parties are utility maximizers and the agent will not always act in the best interests of the principal. **Informational asymmetry** between the principal and the agent arises **adverse selection** and **moral hazard** problems. Informational asymmetry means that the agent knows the quality of the investment better than the principal and has an information advantage. The adverse selection problem relates to hidden information; the best ventures receive only an

average valuation by the investors who do not know the real quality of the venture and therefore the entrepreneurs do not offer the best ventures for investment at all. The adverse selection problem will not be studied here. Moral hazard problem relates to goal conflicts and hidden actions. Due to the information advantage and different interests the agent may either change his actions so that the principal cannot observe the chance or engage in so called "window dressing" which means that the agent improves artificially the short-term conditions of the venture. (Jensen&Meckling 1976, 308-312, LTT-Tutkimus Oy 2005, 3-5, Cornelli & Yosha 2003, 2)

The principal tries to ensure that the agent will make optimal decisions from the principal's viewpoint and this creates costs, so called agency costs. Jensen & Meckling (1976) have defined agency costs as the sum of monitoring costs, bonding costs and the residual loss. The residual loss occurs because despite the monitoring and incentives there will always be some divergence left between the agent's decisions and decisions maximizing the welfare of the principal. (Jensen & Meckling 1976, 308)

The research of agency theory includes two main approaches which complement each other: positivist and normative approach. The **positivist approach** (e.g. Jensen&Meckling 1976, Fama 1980) studies the conflicting goals of the principal and the agent and mechanisms to solve them. The positivist theory is applicable to large organizations where the ownership and control are separated. The agency relationship in large organizations refers usually to the relationship between the shareholders (principal) and the management (agent). The **normative approach** is also known as the **principal-agent framework** (e.g. Eisenhardt 1989). It studies the optimal contract structure. An extension of this approach is the **incomplete contracting theory** concentrating on the optimal ownership structure (e.g. Aghion & Bolton 1992). The incomplete contracting theory includes a view that the contracts are always initially incomplete but that they can be renegotiated at a later stage. (Lahti 2005, 66-68, 89)

Ownership and control incentives are commonly proposed solution for goal alignment between the entrepreneur and VC. Such incentives are created through the use of different financial instruments together with a shareholders' agreement or debt covenants. Covenants typically give the VC the right to control the major decisions independently of the financial structure of the company (Schmidt 2003, 1141-1142). Covenants set forth the principles for the investment period like decision making, member of boards, exit targets and future financing rounds. The use of by-laws for the control purpose may increase along the new Finnish Companies Act.

2.3.2 Agency theory in entrepreneurial context

Since the positivist approach to the agency theory is applicable to large organizations where the ownership and control are separated, it is not directly applicable in the entrepreneurial context. Entrepreneurial start-up

companies are mostly small companies and the entrepreneur is also the shareholder of the company; the control and ownership is not totally separated. Since the entrepreneur is a shareholder he bears also the risks and receives profits of the company's performance. Therefore the goal conflict which usually exists between the management and shareholder is not so strong in the entrepreneurial context.

Even though the direct applicability of the agency theory may diminish in the entrepreneurial context the problem of the information asymmetry remains relevant. The entrepreneur has often better knowledge of the quality of the venture than the investor. The investor may, however, also have superior information e.g. about the commercialization of the business concept. Many of the studies regarding the agency relationship concentrate on the opportunistic behaviour of the entrepreneur and the control mechanisms by venture capitalists. (Kaplan & Strömberg 2003, 306)

The general normative i.e. the principal-agent approach to the agency theory is claimed to have deficiencies because it does not take into account the possibility of opportunistic behaviour by the principal. From the entrepreneur's perspective it is probable that a VC may choose defective strategies when exiting the investment. As Cable & Sahne (1997) have noted the relationship between the entrepreneur and the VC is not always hierarchical where a principal seeks control of an agent's behaviour. Furthermore, an adverse selection problem also exists for entrepreneurs since they need to find a VC with complementary managerial expertise and access to relevant networks. The implications by Cable and Sahne suggest, inter alia, that both entrepreneurs and VCs should use transaction procedures that promote mutual cooperation. Long-term cooperation is more likely if the parties can establish early bilateral bonding mechanisms, penalties for non-cooperative behaviour, staged performance evaluations and distributions of capital as well as payoffs for cooperation. However, entrepreneurs have fewer instruments available than VCs to create bonding mechanisms. An employment contract which commits the VC to employing an entrepreneur for a specified period of time is one example of the entrepreneur's instruments. VCs in turn do use share options, antidilution and forfeiture provisions, non-compete clauses and vesting provisions to motivate the entrepreneur for increasing the financial returns. (Cable & Sahne, 1997, 146-147, 162-163, 167-168, 171)

According to Eisenhardt (1989) the agency theory presents only a partial view and his recommendation is to use the agency theory together with complementary perspectives (Eisenhardt 1989, 71-72). A **prisoner's dilemma framework** is claimed to be a more appropriate explanation of the relationship between the entrepreneur and the VC than the agency theory. The prisoner's dilemma refers to a situation where each party has an incentive to act according to the competitive, narrow self-interest even though cooperation is collectively optimal for both parties. In order to reach goal alignment and increase mutual gain the parties need to build a cooperative relationship. Defection is an optimal choice for an individual who does not know his counterpart's strategy but cooperation leads to a win-win situation for both parties. (Cable & Sahne, 1997, 145-146)

2.3.3 Double moral hazard

Several researchers, for example Sahlman (1990), Schmidt (2003), Casamatta (2003) and Repullo & Suarez (2004), have modelled venture capital financing based on the fact that the success of a venture depends on the effort and commitment of both the entrepreneur and the VC. Furthermore, both parties may have a dual role to provide both knowledge based input and financial input. VCs provide both financial and advisory input. VCs have usually both general management and industry specific knowledge. They have wide networks and can recruit right management and key personnel and get contacts with customers and suppliers. VCs advise on strategic decisions based on their extensive experience in managing growth companies. Entrepreneur's role is to invest his innovation, knowhow and working effort into the project. In addition, VCs may require that the entrepreneur shall also invest money into the project to guarantee the entrepreneur's seriousness of commitment. The project needs undeniably financial investment but the success of the venture depends on the non-financial efforts of the parties.

From the perspective of a business-social entrepreneur, the hidden or unobservable actions of the VC relate to the contributions during the investment period. The entrepreneur does not know on which level the VCs later financial investment and efforts will be; will he liquidate the project or seek only for mid-term financial returns or will he engage in getting the venture into a sustainable growth (growth which enables the innovation to stay alive in a long-term). From the VC's perspective the unobservable actions by the entrepreneur relate to the level of the efforts; VC does not know whether the entrepreneur will concentrate on the high share value or whether the entrepreneur will engage in activities related to his private benefits or social value issues at the cost of financial outcome. The unobservability of the efforts creates the problem of double moral hazard. (Repullo & Suarez 2004, 76-77)

Double moral hazard means a situation where both the entrepreneur and the investor need to put their effort into the venture and both parties may behave opportunistic. The double moral hazard problem applies to situations whereby both the entrepreneur and the VC can be seen as agents and where in the presence of asymmetric information both parties may act opportunistic. Both the VC and the entrepreneur provide a non-observable input following the initial contract. In such case **both parties need incentives** to make first-best input choices. (Schmidt 2003, 1139-1140)

The first research question of this thesis was "does agency theory provide a solution to the alignment of interest conflicts between BS-entrepreneur and VC". An extension of the agency theory, the double moral hazard approach, provides theoretical background to study the potential goal conflicts of a BS-entrepreneur and a VC. Goal alignment means in the context of double moral hazard the alignment of two-way information asymmetry. The parties need to have initially a single agreed goal but the parties do not know whether they will put their best efforts in achieving that goal. Due to the informational asymmetry usually

several investment rounds are used to finance the venture following its stages. Accordingly, investment decisions (including both financial, managerial and human capital investments) will be made based on information that arrives over time. If such information is verifiable and can be expressed in performance indicators or milestones it is possible to design a contingent financing contract which sets forth the conditions for the financing and share of return during the whole investment period. When the information received during the interim phase of the investment period is not verifiable at the initial phase the investment rounds will be raised as they are needed. (Repullo & Suarez 2004, 75, 97)

Financial instruments can be modelled so that they provide an incentive mechanism to use the best efforts of respective parties. This will happen because the financial instruments determine the share of ownership between the parties. The share of ownership has in turn implications both in the control of a company and the share of profits at the exit. Instruments can be made reflective so that the party gets an incentive to take into account the other party's interests. It is also notable that in practice the shareholders' agreements and covenants allocate the control rights in the company irrespective of the ownership structure. Such arrangements guarantee a sufficient level of control by minority owners. (Hart 1995, 97-101, Aghion & Bolton 1992, 473-476)

2.3.4 Convertible instruments as incentives

The second research question of this thesis was "which financial instruments mitigate BS-entrepreneur - VC interest conflicts". As an outcome of the first research question such instruments will be studied in the light of double moral hazard approach. It will be reviewed whether there are instruments, which are reflective in two ways so that both parties have an incentive to take into account the other party's interests and use their best efforts. Many academic papers (e.g. Berglöf 1994, Schmidt 2003, Cornelli & Yosha 2003) suggest that convertible instruments are optimal instruments as will be reviewed below. This view is supported by practical experiences (Gompers 1993, 57, Cumming 2005, 574-577).

Schmidt (2003) provides a solution by using convertible securities, which allocate the ownership and thus the cash-flow rights as a function of the state of the world and the parties' effort. According to Schmidt the convertible securities provide an incentive mechanism in a sequential double moral hazard problem. Such mechanism is used both for the VC and the entrepreneur to ensure that they will invest efficiently. Schmidt models the relationship between the entrepreneur (E) and VC, where the "state of the world" i.e. the quality of the project, the ability of the entrepreneur, market conditions etc. is θ , as presented in Figure 4. (Schmidt 2003, 1139-1140) Schmidt's model is a sequential model where the entrepreneur makes first his investment and only after that the VC makes his investment. In practice, however, the parties often need to make their investment at the same time.

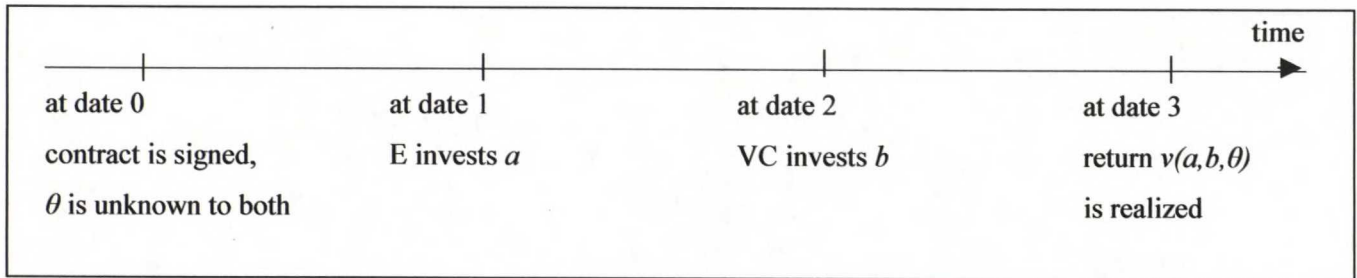


Figure 4: Investments according to Schmidt's model.

For simplicity, only two different states of the world θ will be reviewed here: θ_g for good states of world and θ_b for bad states of world. This leads to two corresponding actions of the VC: supporting actions b_g in case of good states of world and control actions b_b in case of bad states of world. If $\theta = \theta_b$, the expected returns of the venture are poor and the VC chooses control action b_b which is in conflict with the entrepreneur, take away her private benefits from running the company and is substitute to entrepreneur's effort. If $\theta = \theta_g$, the venture is potentially very profitable and the VC chooses supporting action b_g which complements the entrepreneur's effort: VCs give advice on strategic decisions, help to find key employees, suppliers and customers and get even involved in the day-to-day operations of the venture. In the above model at date 3, VC can choose either to receive the fixed payment C for the convertible debt or to convert the debt into equity. This requires that VC has the option to convert the debt C into fraction $\alpha < 1$ of the equity of the venture. The supporting activities by VC requires also that entrepreneur shall invest at least a needed for θ_g and α is large enough to motivate VC to invest b_g . At the same time the entrepreneur is motivated to invest a needed for θ_g in order to receive the supporting and not the conflicting control action by the VC. Accordingly, the convertible security induces both parties to take efficient actions. (Schmidt 2003, 1143-1151, 1158)

Also Casamatta (2003) studies the double moral hazard problems and how to induce both the entrepreneur and the investor to provide investments to support the success of the venture. She distinguishes the investments between financial investment and effort. Similar to Schmidt, Casamatta's model offers a rationale for the use of convertible bonds in the financing of start-ups to motivate a hands-on investor who is actively involved in the venture and has also an advising role in addition to the financing role. Casamatta notes that the same allocation of rights can be obtained through combination of multiple classes of common stock and straight preferred stock. (Casamatta 2003, 2059-2062, 2070-2072)

Convertible securities, such as convertible debt, warrants and convertible preferred equity, are the predominant form of investment among VCs. Venture capital firms have also developed sophisticated contracting practices for the use of convertible securities. (Schmidt 2003, 1139) The conventional wisdom in

the USA has been that convertible preferred shares is the optimal form of finance. The convertible preferred shares have been shown in theory to optimally incentivize the entrepreneur and VC to provide effort and to mitigate agency problems surrounding exit decisions. However, the agency costs differ across different firms and therefore the instrumentation need to be adjusted to mitigate the problems that are most prominent to the company in question. Also other aspects such as the fund structures of the institutional VCs, taxation, the stage of development and asset intangibility effect the use of different forms of finance. Convertible preferred shares include tax advantages in certain countries and downside protection in mediocre ventures. (Cumming 2005, 574-577)

Cornelli & Yosha (2003) report that a convertible debt is more advantageous compared to a mixture of debt and equity for preventing the opportunistic behavior of the entrepreneur. They claim that the information asymmetry is not centred on ex ante asymmetry since at the time of initial investment the parties are often equally informed about the venture chances of success. The main information asymmetry is related according to Cornelli & Yosha to the future actions of the entrepreneur and that the convertible debt provides an incentive for the entrepreneur not to engage in window dressing. The role of the option to the conversion from debt to equity is to adjust the ownership to new information. The convertible debt therefore prevents the entrepreneur from taking excessive risk because if the company becomes very profitable the VC will convert his debt into equity and the entrepreneur's profit will be reduced. (Cornelli & Yosha 2003, 1-3, 26)

Also Berglöf (1994) studies the role of convertible instruments within incomplete contracting framework. He analyzes how the possibility of a future sale of the company affects the initial choice of contract and how distributional interest conflicts associated with the exit stage are mitigated between an entrepreneur and a VC. Berglöf emphasizes in his study that the convertible securities are converted at the time of the sale of the firm. Similar to Cornelli & Yosha, Berglöf's main finding is that convertible debt always dominates pure debt or pure equity or any arrangement combining these instruments. (Berglöf 1994, 247-249)

2.4 Summary of research questions and answers

The first research question in the theoretical part of this thesis was "does agency theory provide a solution to the alignment of interest conflicts between BS-entrepreneur and VC". An extension of the agency theory, the double moral hazard approach, provides theoretical background to study the potential goal conflicts of a BS-entrepreneur and a VC. Goal alignment means in the context of double moral hazard the alignment of two-way information asymmetry.

The second research question in the theoretical part of this thesis was "which financial instruments mitigate BS-entrepreneur - VC interest conflicts". In the light of double moral hazard approach this means

instruments, which are reflective in two ways so that both parties have an incentive to take into account the other party's interests and use their best efforts. Convertible instruments are optimal instruments for this purpose.

3 Instrumentation for case venture

3.1 *Presentation of case venture*

3.1.1 Business environment

As the business of the case venture relates to **in vitro diagnostic (IVD)** business such business environment will be reviewed in this section. The IVD tests mean laboratory test which are performed in order to generate health information to assist physicians and other healthcare professionals in the diagnosis and treatment of diseases. There is a wide range of common diseases which can be diagnosed with IVD, e.g. diabetes, nutritional deficiencies, digestive diseases (liver cirrhosis, peptic ulcer disease), cardiovascular diseases (arterial hypertension, inflammations etc), nephritis, anemia and several communicable diseases (such as HIV, diarrheal diseases, malaria, bilharzia etc) (Curtis et al 2007).

The effectiveness and expenditures on diagnostics has a major impact on public health and national economies. According to Espicom's report (2006) the diagnostic testing accounts for only between 1-2% of government healthcare expenditures worldwide, but influences between 60-70% of healthcare decisions. Thereby it has a significant impact on other health care costs. The effectiveness of the tests guide the patient treatment decisions and the need of additional patient investigations.

Traditionally the blood or tissue samples taken from the patients are transported into large central laboratories to run the tests. The laboratory processes include a wide amount of equipment, instruments, systems, test kits, reagents, calibrators, markers and control materials. The current IVD system is complex and expensive and the current leading IVD companies get their revenue from selling the liquids needed in running the laboratory tests. At the moment the developing countries cannot afford in the central laboratory system.

The global IVD markets are today around 28,000 million USD and of it the global point-of-care (POC) testing market is estimated to be worth 10,000 million USD (Espicom 2006). POC diagnostics testing can be made decentralised without sample transport to central laboratories and without specialised laboratory personnel. With the help of POC diagnostics the doctor can examine the patient, take and interpret the test results during a single appointment. According to the report of Finnish National Technology Agency (2002) the POC diagnostics reduces total health care costs even though the unit price of POC tests have been (so far) higher than in the traditional centralised laboratory test. In Finland with the population of 5,2 million people there are approximately 35 million IVD tests made per year. The potential IVD markets worldwide can be

estimated to be couple of hundred times the market in Finland. If calculated mathematically based on the world's population the need for IVD tests worldwide would be even thousand times of the need of Finland.

3.1.2 Business concept

The business concept of the case company is to provide a high quality and inexpensive point-of-care (POC) testing system i.e. a service terminal which performs clinical laboratory testing locally without need of laboratory facilities and gives real time results. The core technology of the testing terminal is based on liquid micro processor and its functioning is fully automated. The service terminal is intended to be used by a doctor or other health care personnel in connection with patient visits. No laboratory facility or specially trained laboratory professionals are needed at the point of care; even a layman can use the terminal to get the test results as long as he/she knows (or is told by the doctor or nurse taking the patient sample) what tests should be performed. There is thus no need of specially trained laboratory staff in the local point of use. The system is very fast and the test results can be reached within 3-20 minutes. The case venture has already protected the innovation by extensive international patents.

When the service terminal works as a stand-alone unit the test results are based on the reference information uploaded in the local terminal. To guarantee the reliability of the results and to quality control the functioning of the local terminal it will be connected through the Internet into a global network. The network consists of the local terminals which may be first connected into country centers and then into the case venture's database. The samples will thus not be sent anywhere but the test results can be remote controlled through the reference test information which is available in the network. The quality control will be made in the country centers by a laboratory expert. Furthermore, the laboratory experts of the case venture will double monitor the whole system globally.

The case venture needs financial and strategic resources to commercialise its business concept and to get it global. After a completed testing phase of the system the market entry of the innovation shall take place in selected area in co-operation with a private health clinic. At the expansion stage the set-up of the system will be made country by country e.g. in co-operation with local partners who shall be responsible for the country centers. The partners i.e. the customers of the case venture can be either companies in the private sector or public organizations or governments. The case venture may provide the service terminals to the point of use for free. The customer would thus pay only for tests which are requested, performed and quality controlled.

A fundamental feature is that the new testing system is very cheap; the material costs are 80 % lower compared to traditional laboratory testing and there is a minimum need of laboratory and specially trained laboratory staff. The system works without disposable materials and with very small amount of reagents. Therefore the set-up of the new system requires substantially less resources than the existing ones. The

quality of tests is matching or even exceeding the laboratory quality; the tests are performed in a closed unit without disposable consumable parts. The terminal will be replaced after 20,000 tests have been made or after 6 months, whichever comes first. The rate of use of the local terminal and the possible need of maintenance services or replace of the terminal will be remote controlled through the Internet connection by the country centers and the case venture.

In the initial phase the selection of tests which can be performed with the service terminal includes the 20 most frequently requested spectrophotometric tests. In the second version of the service terminal the amount of tests will be 40 including the basic heamatology tests and certain immunology and microbiology tests. All in all this will cover around 75 %-80% of the test requirements of basic health care. The test assortment in the service terminal can be varied for instance so that 35 of the tests are globally the same and 5 of the tests are varied to meet the local needs in diagnostics.

3.1.3 SWOT

A brief SWOT analysis of the case venture is presented in this section and summarized in figure 5.

The strength of the case venture is that there already is extensive patent protection for the process, equipment and the system for the process. Several further strengths are included in the innovation itself as explained above; the process innovation brings real-time test results, patient treatment becomes more efficient, less specially trained personnel and less transport of samples is needed. The process innovation makes the system also affordable in the developing countries as there is no need of expensive infrastructure or expensive analytes and less need of educated staff.

The weakness of the case venture is the lack of financial and strategic resources. It is probable, however, that many international financiers and VCs are interested in the project due to the global business potential. Most valuable partners to the case venture will bring in not only financial resources but especially strategic and networking resources for getting global. Another weakness of the case venture is that the pilot testing system is still under development and the international standards for POC testing need to be developed as well.

The opportunity for the case venture is the huge global potential for the product. The global market potential arises from the many benefits of the product as well as the suitability for the emerging markets.

Although the disruptive features of the product are a strength and an opportunity they are also a threat. VC investments are made for a relatively short period (usually 5-10 years) after which they exit usually through trade sale (i.e. sale of the equity to another company) or through public listings in the stock markets. VCs may consider the disruptive features as a threat since the industry leaders oppose disruptive innovations and

thus the exit possibilities for the VC are weaker. On the other side, the IVD manufacturers might be interested in buying new disruptive businesses in order to reach the monopoly in the markets or to swallow the disruptive invention away from the markets. From the entrepreneur's perspective a trade sale to an IVD manufacturer means threat for the social returns because the buyer may limit the availability of the new system by building monopoly positions in the markets or by preventing the invention to be commercialized. It is important for the case entrepreneur to ensure that the business remains alive as going concern in the long-time perspective and in wide use.

STRENGTHS -patents -disruptive features (claimed strengths of the product itself)	WEAKNESSES -resources for growth and getting global -pilot testing not yet completed -international standards to be developed
OPPORTUNITIES -market potential	THREATS -regulatory processes -disruptive features -loss of social benefits

Figure 5: SWOT of the case venture.

3.1.4 Ownership

The entrepreneur is the inventor who is acting through his family company. The rights to the innovation and patents of the new IVD system are owned by the family company in which the inventor together with his family members are the shareholders. The intention is to establish a new company for the commercialisation of the new IVD system and to assign the proprietary rights exclusively to the new company. The structure of the ownership is illustrated in figure 6. The case venture will be initially owned 100 % by the family company. For the entrepreneur and other key managers a pool of shares will be reserved for motivation and commitment purposes. The financial rounds will bring along additional shareholders. Trade partners i.e. other companies acting in the diagnostics field and other financiers, such as VCs, may become majority shareholders.

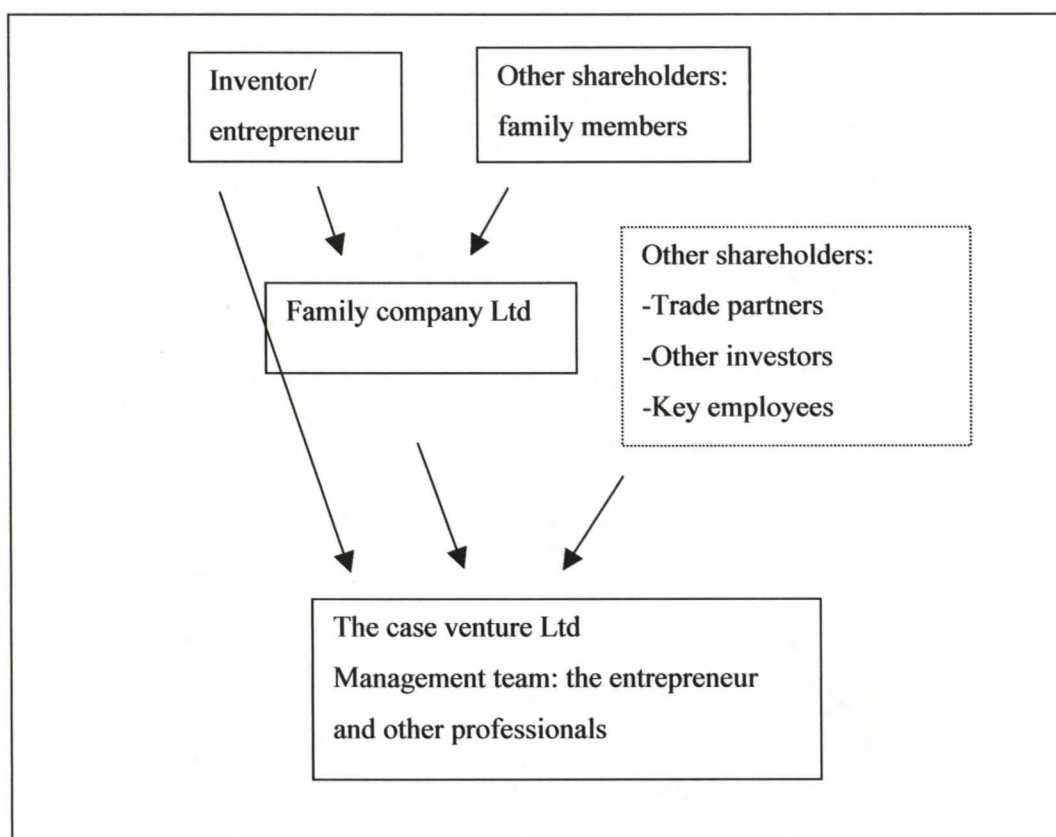


Figure 6: Structure of the case venture.

3.2 Eligible financial instruments

The financial instruments shall fulfil three criteria in order to be eligible: the instruments shall provide 1) upside potential to the share value, 2) downside protection, and 3) incentives to both parties to take into account the other party's interest. The common equity and mezzanine instruments as well as their eligibility have been summarized in figure 7.

Regarding the upside potential of the increased share value it is natural that shares do have this feature. Option rights and convertible loan or option loan provide the upside potential in case they have been used and shares will be acquired. A capital loan or a loan with profit interest do not, as a single instruments, provide advantage of the high share value in the exit situation. However, they can be used together with other instrument which provide the upside potential, e.g. together with option rights. If the option or conversion right will not be used there will be no upside potential. Loan with profit interest offers a better interest in case the company is successful but there is no advantage of the exit situation.

In addition to the upside potential an eligible instrument shall provide downside protection. Ordinary shares do not include any protection for the downside. Shares with a redemption right which enables the holder of

such shares to require that the company shall redeem the shares back at a certain price provides downside protection. Accordingly, in case a convertible share is convertible into a share with redemption right it provides also downside protection. Other share classes do not include downside protection. Option rights, capital loan, convertible loan or option loan and loan with profit interest all provide certain protection for the downside. The investor may keep the option rights unused and not to invest additional amount of money if the venture will not appear to be interesting enough. The risk in option rights is therefore lowest because no investment needs to be made and there is no risk of getting the (unpaid) capital back. In a similar way as regards the convertible loan or option loan if the venture will not be successful the investor shall not convert the debt into shares but retains the right to get the original debt capital repaid with the agreed interest. Capital loan has higher risk compared to other loan arrangements because it is subordinated to other loans and the repayment requires that the restricted equity and other non-distributable items of the company are fully covered.

The third criteria for eligible instruments is the mutual incentives of both parties to take into account the interests of the other party. It is a question of setting forth triggers reflecting the targets of the parties and agreeing on the consequences what happens when the triggers have been met or what happens if the triggers will not be met. In principle such incentives can be added to each instrument with the help of covenants. Certain instruments, however, such as convertible shares, option rights and convertible loans, have a structure where it is more natural to add incentives. These instruments require by definition that the parties will agree on the circumstances when the option or conversion right can be used and what kind of right it will be. It is therefore easy to use triggers and incentives with these instruments.

Instrument	Upside potential of share value	Downside protection	Mutual incentives
Ordinary shares	yes	-	no
Different share classes:			
-voting rights	yes	-	no
-dividend rights	yes	-	no
-liquidation preference (distributive share, fixed share, redemption condition)	yes	+	no
-convertible share	yes	-/+	yes
Option rights	no/yes	+ + +	yes
Capital loan	no	+	no
Convertible loan	no/yes	+ +	yes
Loan with profit interest	no	+ +	no

Figure 7: Eligibility of financial instruments.

Usually several instruments are used together in order to balance the risk and profits and to take into consideration the exit possibilities. Even though an instrument alone is not eligible it can be combined with another eligible one and these instruments together become eligible. For example, as seen from the figure 7 a capital loan would not be an eligible instruments alone but combined with an option right it becomes eligible. For example, ordinary shares together with a convertible loan (capital or ordinary loan) with a sliding conversion scale is a typical combination of different instruments. In the future the use of loans together with free shares enabled by the new FCA may become popular.

3.3 Investment rounds

The financing is usually planned so that new information which arises after certain time has elapsed can be taken into account. When the entrepreneur and investors have different interests of actions and there is asymmetric information of the real situation the parties need possibility to react when the actions realize. The staging of financing and the growth cycle of the case venture is shown in figure 8. The time frame from the beginning of the first investment round to the end of third investment round is planned to be less than ten years so it will be possible for the VC to make the investment and get return realized within the normal investment period. It is also possible that the VC will not join the first investment round but waits until there is enough evidence gathered during the first round that the pilot system is working.

The first financial round should enable the case venture to finalize the pilot product and use it in test environment in Finland. It should take approximately two to three years. Certain trade partners will be the investors during the first investment round. At the beginning the success of the pilot product in the test environment, is unknown to both parties. In case of good situation the test environment shows that the product is ready to be commercialized. In case of bad situation the test environment indicates that the product needs further development before entering larger markets. In case of good situation at the end of first investment round the VC will participate in the second investment round. In case of bad situation at the end of first investment round, VC refrains from the investment.

With the help of the second financial round the case venture should be able to commercialise the new IVD system in whole Finland and/or nearby markets and start serial production for the global markets. At the beginning of the second investment round the success in the market launch is unknown to all parties. In case of good situation the markets will accept the new IVD system and it will become possible to enlarge the business into global markets. In case of bad situation the markets do not accept the business model and the expected returns are poor. Accordingly, the VCs actions are either supporting actions aiming to getting the business global and participating in the third investment round or control actions where the VC aims to liquidate or sell the business no matter of the consequences.

The third financial round should enable the case venture to enlarge its activities into global markets. At the beginning of third investment round the profitability of the larger markets is unknown to all parties. In case of good situation the new markets are potentially very profitable and a business disruption within industrialized markets becomes possible. In case of bad situation neither the less developed countries or industrialized countries accept the business model and the expected returns are poor. Accordingly, the VCs actions are either supporting actions aiming to develop the market entry or control actions where the VC aims to liquidate or sell the business no matter of the consequences. At the exit stage in case of good situation and in case the fraction of equity into which VC can convert the debt is large enough VC will make the conversion. In addition, certain triggers will be agreed in advance which show the preconditions for the conversion of the VC. In case of bad situation VC chooses to receive the fixed payment for the convertible debt.

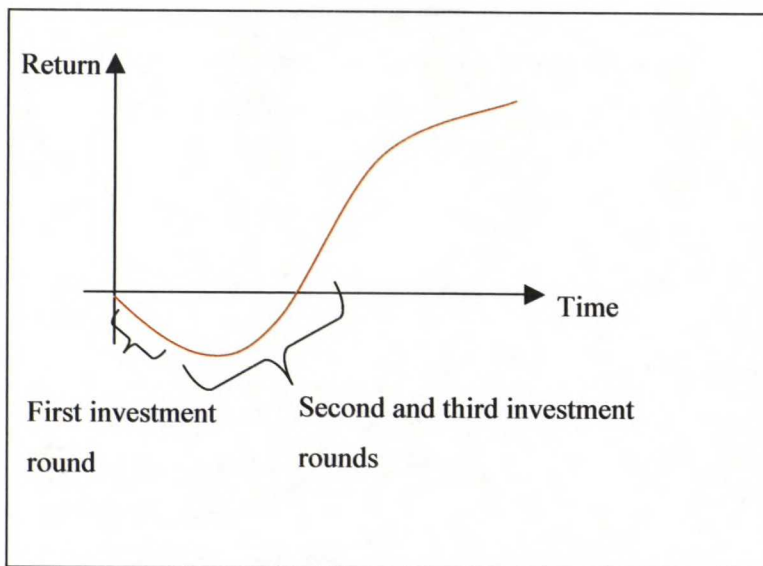


Figure 8: Business cycle of the case venture and investment rounds

3.4 Instrumentation construction

3.4.1 Shareholders' agreement and exit conditions

A starting point for the instrumentation will be that the VC shall be granted a nominal minority shareholders position. Thereby a shareholders' agreement will be set up to cover the standard control rights and exit conditions required by VCs. It is very important to agree on the convenient time when both the entrepreneur and the VC are ready to make an exit. For the entrepreneur the prerequisite will be that the IVD system has received at least the critical mass of users which will ensure that the innovation will stay alive in the markets. The key concern of the entrepreneur is thus the volume to be reached during the investment period of the venture capitalist. If also the venture capitalist will set the volume target (instead of e.g. turnover or profit margin targets) as the main performance target to be measured during the investment period the parties have found at least a starting point for mutual co-operation. It is important to note that the entrepreneur's target is not in conflict with the target of striving for high share value. It is a question of how to reach the financial target. It is notable also that on the other hand the parties should anyhow agree on the business plan which the parties intend to follow. However, in practise the business plans change all the time. It is realistic that the VC will not accept the entrepreneur's wish to have covenants, which limit the exit possibilities through setting qualitative requirement for the buyer of the business. Another pragmatic way of keeping the business alive also after the exit is to make long-term business agreements. This will make it difficult for the buyer to totally swallow the innovation away from the markets. To guarantee that there is enough time to reach a sufficient market position it is suggested that also an exit covenant will be negotiated in the shareholders' agreement which prevents the VC making the exit not until the last year of the investment period. With

regard IPO as an exit strategy the entrepreneur should keep in mind that there can emerge a hostile takeover as well. Furthermore, going public might not be the best strategy as public companies are judged on financial performance and the pressure to quarterly short-term earnings increases.

3.4.2 Convertible instrument with mutual incentives

The main investment to be studied in more detail in the following will include three alternative convertible instruments: (1) capital loan with interest of 13 % and option right to an additional investment, (2) convertible loan with interest of 10 % and (3) loan with low interest of 3 % and free shares. All the alternatives entitle to ordinary shares with a certain conversion rate to be agreed by the parties. The initial conversion rate will be subject of adjustment to reflect the fulfilment of agreed business targets.

Definition of joint performance objectives in specific terms is pivotal for building a lasting and communicative relationship with the investors. To specify the business-social entrepreneur's critical mass target into practice is a challenging task. The parties may use e.g. following metrics to set up volume targets:

- number of stand-alone users
- number of networked users
- number of countries where the IVD system has been launched
- number of international public organization which have adopted the IVD system to their programs.

It is worth noting that in the case venture the volume targets do reflect both financial and social targets of the parties. With a successful performance targets both the social and financial targets will be covered so that the VC is enabled to make the investment without too high a risk or inadequate reward.

Performance targets are used traditionally to incentivise the entrepreneur to strive for a high share value. This means that the amount of shares which the investor would receive will be bound e.g. to the turnover of the company and the conversion rate will change in relation to the fulfilled target. If the turnover is less than the target the investor will receive higher amount of shares and the ownership of the entrepreneur will dilute and vice versa. Accordingly, a part of the equity passes from the VC to the management if certain levels of performance will be achieved. This can be done, for example, by cancelling certain number of shares of the VC or by reducing the number of shares into which the convertible debt or option right entitles. This will enable the entrepreneur (and management) to increase their relative share of ownership if the case venture meets its financial targets. The target can be, for instance an aggregate profit target for over certain years. (Sharp 2001, 46, Hidén et al 2005, 225-228)

Here, a new combination of incentives will be studied. The first part of the combination includes provisions which aim to incentivise the entrepreneur in a traditional way. A financial performance target will be chosen

and if the target will be reached the entrepreneur's share of ownership will increase and the conversion rate of the VC will worsen.

The second part of the incentive includes provisions which aim to incentivise the VC in a new way. A volume performance target will be chosen to motivate the VC to support the strategy which enables the creation of large social benefits (and also strives for high share value). The entrepreneur is willing to grant as a bonus a larger number of shares to the VC in case such performance targets will be agreed and reached. Through this instrumentation the volume targets should receive stronger status in the venture compared to a situation where they are just laid down in the business plan which is subject to changes all the time. The variables reflecting the volume may be, for example, launch countries and distribution programs of international public organisations. The conversion scale in between the initial and maximum points will improve step by step as roughly described in figure 9 below. In the example the conversion rate is at the lowest possible level when the product has been launched in five countries and adopted for one program. The maximum level of conversion in the example is in a situation where the IVD system has been launched in 15 countries and adopted for distribution in five international programs of public organizations. The maximum is three times the initial conversion rate in the example calculations followed later in this thesis.

Programs											
5	+xxx%	+xxx%	+xxx%	+xxx%	+xxx%	+xxx%	+xxx%	+xxx%	+xxx%	+xxx%	+300%
4	+xx%	+xx%	+xx%	+xx%	+xxx%	+xxx%	+xxx%	+xxx%	+xxx%	+xxx%	+xxx%
3	+x%	+x%	+xx%	+xx%	+xx%	+xx%	+xx%	+xx%	+xx%	+xx%	+xx%
2	+x%	+x%	+x%	+x%	+x%	+x%	+x%	+x%	+xx%	+xx%	+xx%
1	Initial conversion rate	+x%	+x%	+x%	+x%	+x%	+x%	+x%	+x%	+x%	+x%
	5	6	7	8	9	10	11	12	13	14	15
											Countries

Figure 9: VC's targets improving the conversion rate.

The joint net effect of the two-way incentives is shown in figure 10. If both parties will achieve their performance targets in full the net effect will be positive to the VC i.e. the conversion rate of the VC will increase.

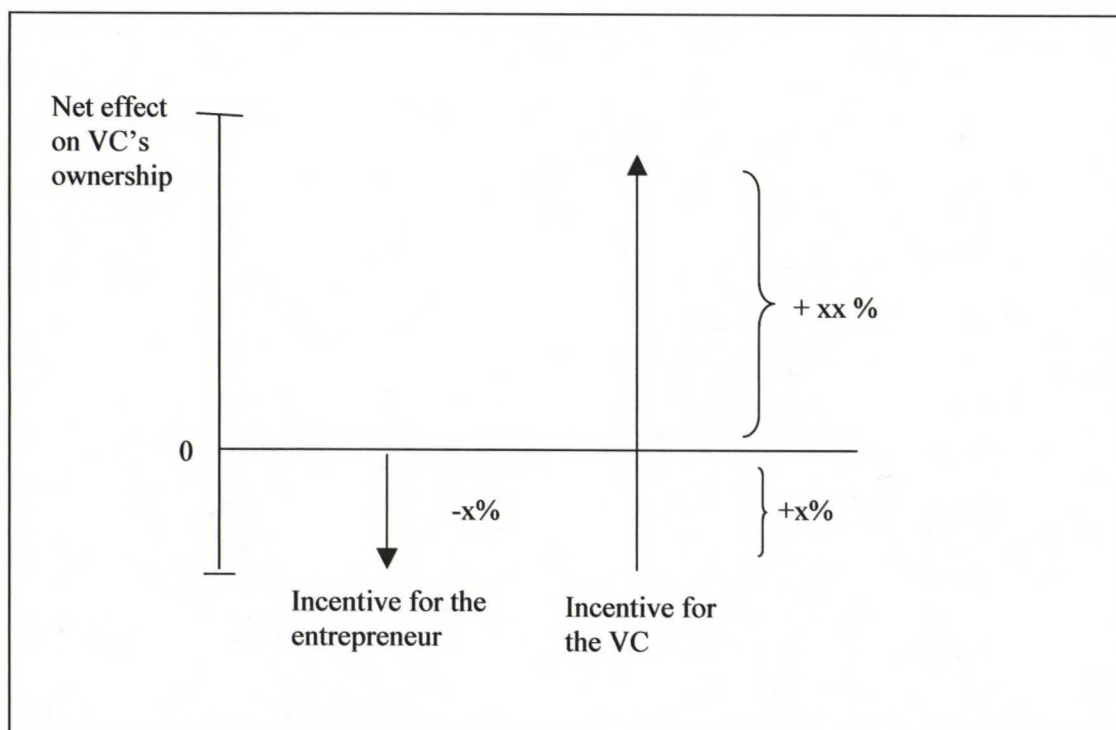


Figure 10: Two-way incentives.

3.4.3 Relative return levels

Figure 11 below describes the relative return levels between the instruments. Ordinary shares are taken into the figure as a reference. For simplicity, only the effect of the VC's incentive has been described in the following. As shown in figure 9 above the effect on the return level will diminish in case the entrepreneur will achieve his performance target. The idea is, however, to set the performance targets so that even if the entrepreneur will achieve his targets in full the highest return levels will still be achieved with convertible instruments (and not with ordinary shares).

At the initial conversion rate situation the ordinary shares have the highest return level. When the conversion rate is improved the other instruments will have higher return level compared to ordinary shares. The three alternative convertible instruments will be reviewed in the following with example calculations. The intersection of the ordinary shares' return level with capital loan happens when the conversion rate is increased 5 %, with convertible loan when the conversion rate is increased by 11 % and with ordinary loan when the conversion rate is increased by 75 %.

The first alternative, capital loan and option right to additional investment, would mean in the case venture's context an ordinary capital loan in accordance with the FCA with an interest of 13 %. The investor may make an additional investment which conversion rate will be based on the fulfilment of the VC's

performance targets. Through the conversion the investor receives ordinary shares providing the upside potential. This alternative is actually an option loan; separate loan agreement and an option right. The downside protection in the capital loan is lower than in other loans due to the subordinated nature and restrictions in the repayment of the capital and interest. To give some compensation for this, the interest is on the highest level, at 13 %. The upside in the initial conversion rate situation is 6 % lower compared to ordinary shares but in case the conversion rate will be multiplied with 3 the relative return is 228 % higher than in case of ordinary shares. When the conversion rate has improved with 5 % the returns of capital loan equal the returns of initial investment by ordinary shares.

The second alternative, convertible loan, shall mean in the case venture's context an option right, which is connected to the loan agreement so that the subscription of new shares will be paid off against the debt. Thereby no additional investment is needed in case the option will be used and the loan will not remain payable but it will be paid off. The conversion rate of the loan will depend on the VC's performance targets. The downside protection in the convertible loan is subordinated to the third alternative, loan with free shares, but has better preference than capital loan. To give some compensation for this, the interest is set on the medium level, at 10 %. The upside in the initial conversion rate situation is 13 % lower compared to ordinary shares but in case the conversion rate will be multiplied with 3 the relative return is 221 % higher than in case of ordinary shares. When the conversion rate has improved with 11 % the returns of convertible loan equal the returns of initial investment by ordinary shares.

The third alternative, loan with free shares, shall mean in the case venture's context a loan, which has first preference but interest at a level, which does not create returns due to the inflation. The investor has right to receive shares for free based on the conversion rate, which is again based on the VC's performance targets. Due to the lowest risk and since no additional investment is needed the amount of shares will be the lowest in order to balance the return level from the investment. The upside in the initial trigger situation is 40 % lower compared to ordinary shares but in case the trigger will be multiplied with 3 the relative return is 68 % higher than in case of ordinary shares. When the conversion rate has improved with 75 % the returns of convertible loan equal the returns of initial investment by ordinary shares.

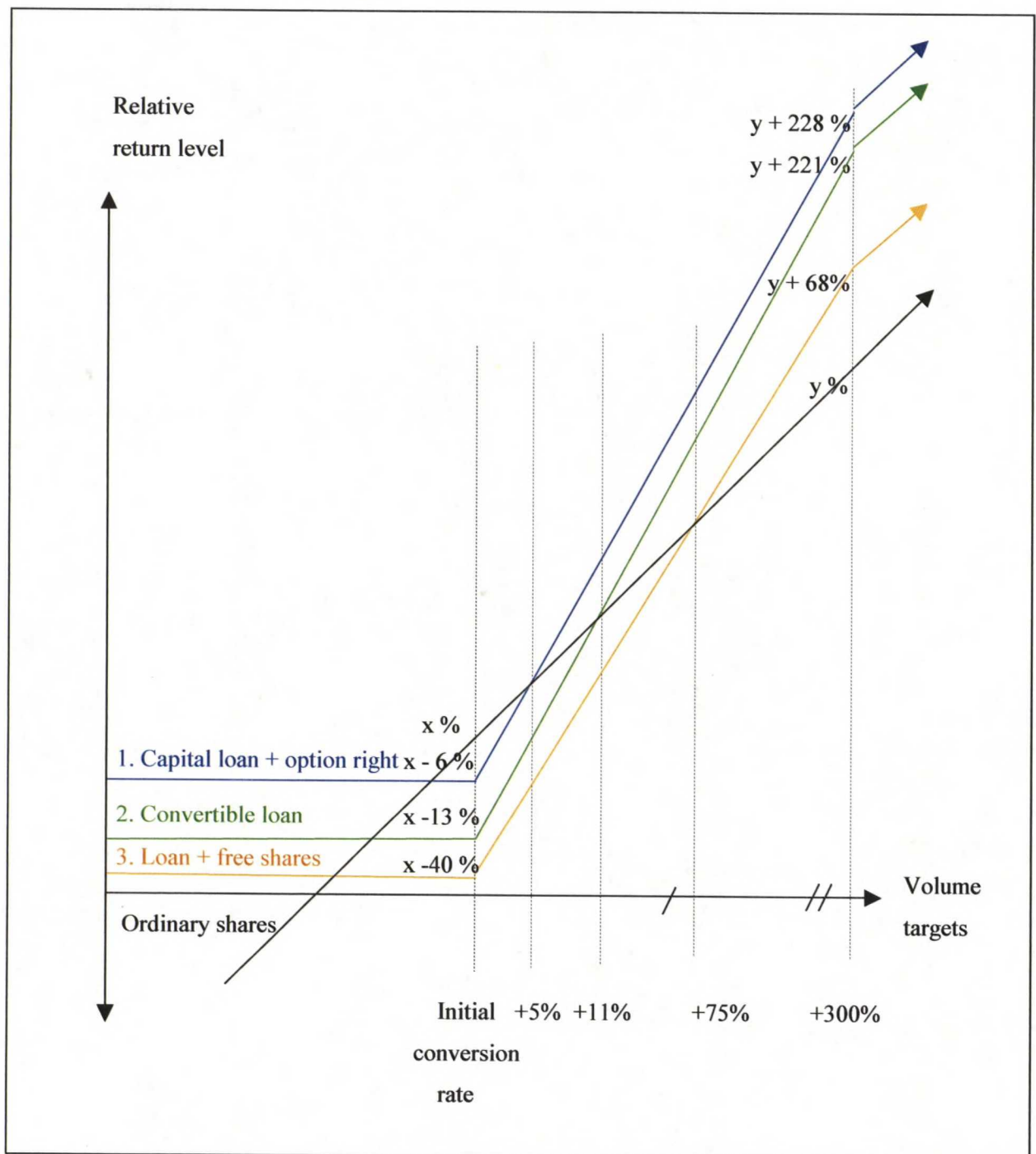


Figure 11: Functions of relative return levels with different instruments. Note that the scales of X and Y axes are not linear.

3.4.4 Summary of instrumentation alternatives

Figure 12 sets forth the summary of the features of the different instruments: ordinary shares and the convertible instruments. All the instruments provide access to the upside potential. The downside protection has been mitigated somewhat with the interest level during the investment and with the number of shares owned or received in the initial conversion rate situation. The last column, relative return, shows the relative return of the instrument in the maximum conversion rate situation.

The instrumentation includes several limitations due to its generality. Firstly, the construction has been limited for practical purposes so that tax issues have been left outside the consideration. Secondly, commonly used liquidation preference clauses have not been taken into account. This is because the liquidation preference can be added to any of the alternatives and thus it does not make any real difference between the instruments. Thirdly, the role of management (in addition to the entrepreneur) has not been considered because only the relation VC-entrepreneur has been studied. It is evident that each company has key persons and management (in addition to the entrepreneur) which support and involvement is necessary for the implementation of any strategy.

	Upside potential	Interest	Downside protection	Number of shares, initial conversion rate	Relative return, maximum conversion rate
Ordinary shares	Yes	(dividend)	-	+++	+
1. Capital loan, option right upon certain triggers	no/yes	13 %	+	++	+++
2. Convertible loan with medium interest, sliding conversion scale	no/yes	10 %	++	++	+++
3. Loan with low interest, free shares upon certain triggers	no/yes	3 %	+++	+	++

Figure 12: Summary table.

3.5 Practical functioning

3.5.1 General

The first research question of the empiric part of this thesis was what is the instrumentation to be suggested for the case company aligning the different interests of BS-entrepreneur and VC. According to the construction described in Section 3.4 (Instrumentation construction) the construction includes following key elements:

- shareholders' agreement to agree on control rights
- initial period with forbidden exit
- convertible instruments, interest and conversion rate levels reflecting the downside protection
- option pool of shares for entrepreneur, bound to financial targets with sliding scale
- option pool of shares for VC, bound to volume targets with sliding scale.

It is important to note that even if the above construction works in technical terms it does not necessarily work in practise. Therefore an essential part of this thesis has been to gather practical reactions and comments from the entrepreneur and investors. As Kasanen et al (1993) have noted, it is always, however, difficult or impossible to assess the practical adequacy of any new construction prior to its implementation (Kasanen et al 1993, 246).

Five Finnish venture capital professionals were chosen to get comments to the construction of instruments. Three of the professionals represent current members of the Finland's Venture Capital Association and their capital under management is between 50 million euros to 190 million euros. One of the professionals represents a privat investment company investing from the balance sheet of 44 million euros and one of the professionals has previously been actively involved in venture capital business for ten years. One of these five professionals was already familiar with the diagnostics business and even the case venture and could thus give highly developed comments. The sample of the VCs can be considered to be representative.

The discussions with the entrepreneur and the VCs have been held based on the slide show in Appendix A. The entrepreneur and VCs were asked about their views on the following themes:

- A. Whether the technical idea of the construction was understood;
- B. Opinion about early exit and initial period to prevent early exit;
- C. Opinion about nominal shareholders' position and convertible instrumentation alternatives, interest rates and downside protection;
- D. Opinion about targets bound to conversion rate and new way of using targets, to incentivize the investor;
- E. Preferred instrumentation in general.

The comments received will be reviewed and analysed in the following. Based on this the actual suggestion for the instrumentation for the case company will be provided in Section 4.1 (Conclusions with respect to the case venture).

3.5.2 Comments by entrepreneur and VCs

The entrepreneur's comments to the above points A.-E. were as follows:

A: The technical idea of the construction was understood.

B: It was emphasized that the risk of early exit should be minimized. The concept of initial period preventing the early exit was seen positively.

C. The construction of nominal shareholders' position was accepted. The entrepreneur could not specify which of the convertible instrument alternatives would be most preferred.

D. The bonus to the investor in return for fulfilled volume targets was acceptable.

E. Any generally preferred instrumentation was not specified. The most important thing to the entrepreneur was to guarantee that in addition to the financial returns there will emerge social benefits for as wide population as possible.

The first VC's comments to the above points A.-E. were as follows:

A: The technical idea of the construction was understood.

B: Attitude to the initial period to prevent early exit was negative but possibly negotiable. It was noted that the continuation of the business at the exit situation is at the hands of the buyer.

C. Nominal shareholders position and convertible instruments was seen as a possible but not preferred construction. The differences between the alternative convertible instruments were not seen relevant because if the venture does not fly all investments will be lost no matter which instrument has been chosen. The downside protection has only relevance in case of mediocre investments.

D. It was questioned to what extent the VCs could contribute to volume targets in practise. VC should understand the IVD business logics in order to set the performance targets and be able to commit into a structure whereby VC's bonus should depend on the performance targets actually performed by the entrepreneur and management.

E. Straight investment into shares right from the beginning together with a loan, which would be paid back if the venture is at least mediocre was preferred.

The second VC's comments to the above points A.-E. were as follows:

A: The technical idea of the construction was understood.

B: Attitude to the initial period to prevent early exit was negative but negotiable for a maximum period of two years. It was noted, however, that each condition limiting the VCs possibilities to operate would have a price.

C. Nominal shareholders position and convertible instruments was seen as a possible construction. The practical limitation of missing liquidation preferences was noted. Regarding the instrument alternatives it was noted that there are no low-risk instruments. If the venture will fail all the investments will usually be lost, no matter of the instrument.

D. It was noted that in practice it would be difficult to agree on a sliding scale; when the VC finds out how much of ownership the entrepreneur is willing to give, the VC will try to negotiate that part for it without any performance triggers.

E. Convertible loan was preferred.

The third VC's comments to the above points A.-E. were as follows:

A: The technical idea of the construction was understood.

B: It was claimed that when the VC knows the business area and the huge opportunities the VC is not willing to make an early exit. It was noted that the VCs should plan their own business so that they are not forced to make a premature exit due to the timing of the close-end funds. The attitude to the initial period to prevent early exit was negative but negotiable depending on the duration of the financing round. For example, an exit prohibition, which lasts for the investment period minus the last year, could be negotiable.

C. Nominal shareholders position and convertible instruments was seen as a possible but not preferred construction. Instead of interests burdening the venture during the investment period different option arrangements were preferred. Differences between the convertible instruments were not seen relevant because none of the convertible instruments was seen optimal in the initial investment. It was claimed that they are more useful instruments at later stages if bridge financing is needed.

D. It was noted that a conversion rate, which is bound to performance targets is not functional, because the targets are difficult to set and they are not usually reached. Furthermore, profit or turnover targets may lead to wrong activities in terms of long-term business success. Regarding other targets it is difficult to know which ones reflect best the desired way of business in the long-term and to which level the targets should be set. It was noted that the role of the management (in addition to the entrepreneur) has not been considered in the construction. The incentive addressed to the investor could be used for the new management; the effect would be the same from the entrepreneur's perspective. The volume target as a normal business target (without connection to the conversion rate) was deemed to be a suitable performance target in the case venture.

E. Investment into ordinary shares right from the beginning was preferred plus a structure whereby the valuation of the company will not be changed based on performance targets. Simplicity and easiness was valued.

The fourth VC's comments to the above points A.-E. were as follows:

A: The technical idea of the construction was understood.

B: It was noted that VCs should themselves plan their own business so that they are not forced to make a premature exit due to the timing of the close-end funds or due to other businesses needing cash.

C. Nominal shareholders position and convertible instruments was seen as a possible construction. It was claimed that the preference between the different convertible instruments should be based on the absolute return figures (which were not available).

D. It was questioned to what extent the VCs could contribute to volume targets in practise. VC should understand the IVD business logics in order to set the performance targets and be able to commit into a structure whereby VC's bonus should depend on the performance targets actually performed by the entrepreneur and management.

E. Straight investment into shares right from the beginning together with a loan which would be paid back in case the venture is at least mediocre was preferred. The new construction providing a bonus of higher return levels was taken, however, as a negotiable suggestion since the primary thing which matters to the VC is the return in successful exit situation.

The fifth VC's comments to the above points A.-E. were as follows:

A: The technical idea of the construction was understood but not accepted. The fifth VC could not find any rational reason for the construction. It was noted that the starting point for an investment is unsound if the entrepreneur has also societal targets.

B: It was claimed that the entrepreneur's fear of premature exit is not reasonable in the real world: if there really are huge opportunities the VC is not willing to make an early exit. The attitude to the initial period to prevent early exit was negative but negotiable.

C. The differences between the convertible instruments were not seen relevant because the idea of the possible construction was not accepted at the first place.

D. The difficulty in setting performance targets was noted; usually they are not applicable after one year.

E. It was claimed that the trust in the entrepreneur is more important than the financing agreements. The instrumentation is a secondary question to the fundamental question of whether to invest in the venture at all.

3.5.3 Analysis based on comments

The technical idea of the construction was understood by the entrepreneur and all VCs. It would be technically possible to implement the construction in practice.

The VCs highlighted that the entrepreneur's fear of early exit is pointless if the venture has real potential in the markets. The VCs will wait until the value of the venture grows and will make the exit only after that. Anyhow, an initial period to prevent early exit is a negotiable item to the VCs. The effect of such condition depends, however, on the length of the investment round. Should the investment round take only two years the VC requires a possibility to make an exit already after one year.

The entrepreneur was flexible regarding the instrumentation as long as it guarantees that also societal targets will be taken into account in addition to the financial targets. Accordingly, the entrepreneur is principally ready to grant additional share of ownership to the investors as a bonus if also the societal targets will be reached. The nominal shareholders' position in the beginning and convertible instruments allowing the increase of ownership was generally seen as a possible but not necessarily the most preferred construction by the VCs. The most important thing to the VCs is the financial return in a successful exit situation. The downside protection of the convertible instruments is a secondary thing and relevant only if the performance of the venture is mediocre. Furthermore, interests running during the investment period might not be optimal as they burden the performance of the venture.

The difficulty in setting working performance targets was generally emphasized by the VCs. However, the VC knowing the IVD business environment and the case venture confirmed that the volume targets as such would be applicable in the case venture. Financial targets during the investment were not seen desirable, as they may not be optimal with respect to the valuation target at the exit phase. The VCs were not convinced about the entrepreneur's willingness to strive for societal targets if it would lead to increased ownership of the investor. Notwithstanding, an interest to the bonus providing higher returns than ordinary shares was expressed.

As stated above the entrepreneur was flexible with respect to the instrumentation. The VCs valued simplicity and easiness and the instruments they are already familiar with. Generally, a straight investment into ordinary shares with a loan to be paid back was preferred by several VCs.

3.6 Summary of research questions and answers

The first research question of the empiric part of this thesis was what is the instrumentation to be suggested for the case company aligning the different interests of BS-entrepreneur and VC. The construction includes following key elements:

- shareholders' agreement to agree on control rights
- initial period with forbidden exit
- convertible instruments, interest and conversion rate levels reflecting the downside protection
- option pool of shares for entrepreneur, bound to financial targets with sliding scale
- option pool of shares for VC, bound to volume targets with sliding scale.

The second research question of the empiric part was which of the alternative instruments in the construction do the case entrepreneur and selected VCs prefer. To summarize the views, the entrepreneur is flexible with the instrumentation and the VCs prefer the instruments they are familiar with and which are simple and easy

to apply. The downside protection of the instruments was seen as a secondary question to the as high upside potential as possible by the VCs. The entrepreneur was principally ready to grant additional share of ownership to the investors as a bonus if societal targets will be reached and the VCs expressed an interest to a bonus providing higher returns than ordinary shares.

4 Conclusions

4.1 *Conclusions with respect to case venture*

As summarized above, the entrepreneur is flexible with the instrumentation and the VCs prefer the instruments they are familiar with and which are simple and easy to apply. The downside protection of the instruments was seen as a secondary question to the as high upside potential as possible. The initial period to prevent early exit and the two-way incentives introduced in Section 3.4 above are items, which can be negotiated with the VCs.

The practical suggestion followed by the comments received from the entrepreneur and the VCs is to use the equity, debt or mezzanine instruments the parties are familiar with. This means that also instrumentation, which is made in ordinary shares right from the beginning, should be considered; the two-way incentive can be also used in connection with ordinary shares. In that case the free bonus shares will be given at a later stage if the performance targets have been met. The entrepreneur should try to first agree on the initial conversion rate and only after that start discussions on the VC's incentive bonus. This is probably the toughest part of the negotiations; to suggest a bonus so that it will not open the question of initial conversion rate again.

More importantly, as the entrepreneur and the investors will not be the only agents in the case company also the role of management needs to be taken into account. From the entrepreneur's perspective the VC's pool of bonus shares could be directed also to the management. The management would receive share of ownership if the volume performance targets have been met. From the VC's perspective this worsens his position as he would not receive any bonus. On the other hand, this would be more conventional way of planning the instrumentation and acceptable and even preferable therefore for the VCs. From the management's perspective the bonus shares will act as an incentive to strive for volume targets.

In summary, the proposed instrumentation for the case company is at the general level as follows:

- shareholders' agreement to agree on control rights
- initial period with forbidden exit
- equity, debt or mezzanine instruments VC is familiar with
- option pool of shares for entrepreneur and management, bound to volume targets with sliding scale.

This instrumentation is simple and easy to apply. It also provides powerful status for the volume targets.

Thereby it opens up strong possibilities that both financial and social benefits may arise from the business.

4.2 Conclusions with respect to theoretical approach

The construction produced in Section 3.4 is based on the previous research on agency theory and double moral hazard. It is acknowledged that the information asymmetry is two-way in the entrepreneur-VC relationship. Different convertible instruments were chosen for the construction based on the previous research. The construction was theoretically warranted to include the most optimal instruments.

The scientific relevance of the construction shall be studied through the validity of the construction and the practical suggestion to solve the research problem. A working construction shall be relevant to the problem, simple and easy to use. The initial construction presented in Section 3.4 is relevant to the problem but not very simple and easy to use. This is because it is a new construction. The practical working of a new construction can be known only after its implementation and it may take a long time. Therefore a more pragmatic suggestion for the case venture has been provided in Section 4.1.

The pragmatic suggestion provides an additional important feature to the theoretical discussion of the construction. In entrepreneurial context the management should not be left outside the consideration. A novelty of the suggestion is that the actual structure is **triple moral hazard** instead of double moral hazard. The entrepreneur, management and investors all have different roles and different interests. In general, if the principal does not know whether the agent will support principal's goals, performance targets should be applied to give incentives to strive for the desired target. If only the two-way relationship of entrepreneur-investor will be considered the entrepreneur shall place incentives to the investor and vice versa. In practice, however, the role of management needs to be taken into account. From the entrepreneur's perspective both the investor and the management are agents. From the VC's perspective both the entrepreneur and the management are agents. With the right financial instrumentation each agent can be handled either through incentives or covenants controlling their behaviour. From the theoretical point of view the concept of triple moral hazard provides a logical area for further research.

If the construction introduced in Section 3.4 will be implemented in practice this would provide a basic source of further research to prove the practical working of the new construction. In the meantime, market tests would reveal interesting information on whether there have been previously incentives laid for VCs, what kind of incentives and how they have worked.

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APPENDIX A

Diagnostics Service

Contents

- Business of the case venture
- Targets and concerns
- Three investment rounds
- Instrumentation
- Main investment alternatives
- Triggers
- New trigger? (1-2)
- Market position targets
- Improved conversion rate for the investor
- New combination of triggers?
- Relative return
- Summary table

Business of the case venture

Automatic laboratory testing system at the point of care.

Set-up in each country in co-operation with local partners, either private or public health clinics. Service terminals at the point of care utilized by a doctor or nurse and a country center with a laboratory person. Network connection through internet to a country center and to the case venture.

Service terminals will be provided for free. The partner will pay only for tests which are requested, performed and quality controlled. High volumes and low margins.

No transport of samples. Real-time test results. Remote quality control by the country center. Double monitoring by the laboratory experts of the case venture. Effective patient treatment.

Targets and concerns

Disruptive innovation: cheap system, less trained laboratory personnel needed, less equipment needed.

Due to the disruptive features it is essential to find a mutual understanding of the market entry strategy. Testing phase in Finland. Target markets ultimately global. New markets to be found: developing countries?

Entrepreneur's target:

- the market position in the exit shall be such that the business will remain alive
- wide use, no exclusive rights

Entrepreneur's concern:

- hostile acquisition by an industry leader
- exit of venture capitalist before there is a critical mass of users

Three investment rounds

1. Testing phase in Finland
 - 2 years
 - 2 ml/UR
 - public funding or industrial partners
2. Commercialization in Finland, getting ready for serial production of the service terminal, approved standards for the system
 - 2 years
 - 3 ml/UR
 - venture capital
3. Expansion
 - 3 years
 - 4-8 ml/UR
 - venture capital + exit

Instrumentation

- Starting point:
 - minority shareholders position for VC
 - standard shareholders' agreement for control rights
- Main investment with triggers
 - 3 alternatives
 - a possibility to use triggers in a new way will be studied
- Exit only after the initial period of __ years
 - to guarantee enough time to reach critical mass of users

Main investment alternatives

1. Capital loan with 13 % interest + option right.
2. Convertible loan with 10 % interest.
3. Loan with 3 % interest + free shares.

The option right/conversion right may be used or free shares received after the initial period.

Triggers

- Traditionally triggers are used to incentivise the entrepreneur to strive for a high share value.
- The amount of shares which the investor will receive with a convertible instrument will be bound e.g. to the turnover of the company.
- The conversion rate will change in relation to the fulfilled target.
- If the turnover is less than the target the investor will receive higher amount of shares (the ownership of the entrepreneur will dilute) and vice versa.

New trigger? (1)

To be studied:

- Can the triggers be used also to incentivise the investor to strive for a high share value *through the same way* as the entrepreneur wishes?
- Entrepreneur's target: market position where critical mass of users is reached before the exit is made.
- Note: the entrepreneur's target is not in conflict with the target of striving for high share value.

New trigger? (2)

To be studied:

- the amount of shares which the investor will receive with a convertible instrument will be bound to certain criteria which reflect the market position desired by the entrepreneur
- initial conversion rate guaranteed
- conversion rate will be improved in relation to the increased target fulfillment; investor will receive higher amount of shares (the ownership of the entrepreneur will dilute)

Market position targets

The market position to be measured e.g. through following metrics:

the system shall be launched in 5 countries within 5 years

the system shall be adopted for 1 health program run by a public organization within 5 years.

A list of desired countries and organizations to be made (qualitative criteria to be included).

Improved conversion rate for the investor

Programs

5	+ xx %	+ xx %	+ xx %	+ xxx %	+ xxx %	+ xxx %
3	+ x %	+ x %	+ x %	+ xx %	+ xx %	+ xxx %
1	Initial Conversion Rate	+ x %	+ x %	+ x %	+ x %	+ x %
	5	7	9	11	13	15 Countries

New combination of triggers ?

A traditional trigger to incentivize the entrepreneur:

- five-year period aggregate profit target
- if the target is met the conversion rate of the investor will decrease by ___ %

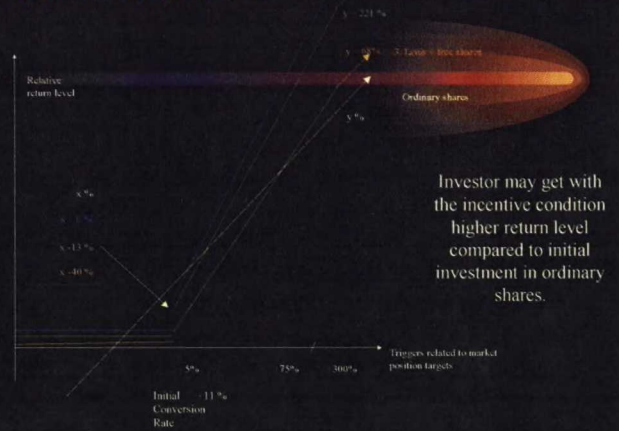
And a new provision to incentivize the investor:

- five-year period targets for the market position
- depending on the targets the conversion rate of the investor will improve by up to ___ %
- when the conversion rate has improved ___ % the returns with capital loan and convertible loan equal the returns of initial investment of ordinary shares



to fulfill both financial and market position targets

Relative return



Summary table

	Upside potential	Interest	Downside protection	Relative return, initial conversion rate	Relative return, triggers fulfilled
(Ordinary shares)	(yes)	(dividend)	(-)	1.1	1
1. Capital loan, option right upon certain triggers	no yes	13 %	1.1	1.1	1.1
2. Convertible loan with medium interest, sliding conversion scale	no yes	10 %	1.1	1.1	1.1
3. Loan with low interest, free shares upon certain triggers	no yes	3 %	1.1	1.1	1.1