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1. Introduction

Venture capital is a possible financing form for start-up firms and entrepreneurs that need financial funding. There is hardly any information about venture capital in Austria, although there already is limited literature on venture capital in Europe. Most of academic literature available is from the United States, where venture capital is more popular.

The purpose of this thesis is to get an overview of venture capital deals and its characteristics in Austria. I want to observe if venture capital deals in Austria have an impact on the performance of the firms that received the invested capital. Furthermore, I look at the different factors that may influence this relationship.

This thesis consists of a theoretical and an empirical part. Venture capital is still better established in the United States than in Europe. Therefore the theoretical part of this study is based on international literature. This way the reader gets a broader impression of this financing form. The information derived can be compared with the actual situation in Austria in the empirical part.

The theoretical part begins with chapter two, in which I explain the term venture capital and go through the different steps of the investment process. The aim of this chapter is defining venture capital and getting an impression of how the investment itself works. The understanding of this fundamental process is very important in order to be able explaining the consequences this financing form implicates. Another part of this chapter is the explanation of the different exit strategies which will become important in the empirical part. I define the various possibilities of exiting the investment and point out which ramifications it has for the investor as well as for the entrepreneur. The choice of the exit strategy already gives a clue at the firm performance. In addition to that I shortly write about the situation of venture capital in Europe.

The third chapter deals with agency problems that can occur within the investment process. I listed and explained the most common ones that venture capital deals entail. As always there arise different conflicts between the various parties involved in the investment process. A short overview of these problems is essential as I will discuss strategies to mitigate them later in chapter four. My aim is it to find out if these possible solutions help improving the performance of venture capital-backed firms. A big part of this chapter is dedicated to staging

and syndication, two strategies to mitigate agency problems. It is one of the most important aims of this thesis to find the reasons for choosing these strategies and consequently analyze the real impact of them on venture capital deals in Austria.

This leads me to the empirical part in chapter five. Based on data of Venture Source I analyzed venture capital deals in Austria. As already mentioned, I compared the findings of the theoretical part with the results of my empirical study. Therefore, I developed some hypotheses based on the international literature. With the help of my empirical study I confirmed or neglected them. The interesting point here is that international effects are compared with Austrian so that it becomes clear if the investment behavior and the consequences of venture capital are different for Austria. First, I generally analyzed venture capital in Austria with the help of some descriptive statistics. Secondly, I showed and tested the impact of venture capital on the performance of venture-capital backed firms. I analyzed relationships between different factors and the firm performance. The greatest part of this study is the analysis of the impact of staging and syndication on firm performance. My results show that the situation in Austria basically applies to the common opinions in my theoretical part, although there are some points in which I had to neglect my hypotheses.

2. Venture Capital

Venture capital is a very important source of supporting start-up firms and entrepreneurs that need financial funding. In fact, it is not the most prominent form of providing financial capital as many young firms decide to rather consult banks or private investors, which includes friends and family members. Sometimes they even choose entering the public market without ever having asked for financing before.¹ Some firms do not have the option of receiving money from banks due to a lack of securities. Especially start-up firms do not have the hard assets required. Because of the high risk, banks will refuse investing money into the project. The same is true for investment banks and public equity. There are regulations that prohibit entering the public market when the sales are not high enough. At this point venture capital firms can be considered as a possible alternative.²

Venture capital is usually offered to small businesses in order to finance their start-up or their expansion. In the case of a management buyout or buy-in, also larger companies can receive support. The money can be provided by either an individual, as for example a business angel, or by an organization, a venture capital firm. These providers are specialized on high-risk and high-growth firms. The particular feature of venture capitalists is that they do not simply invest capital. They also advise the management and monitor it. In addition, they can facilitate the access to networks including lawyers, accountants, investment bankers and other important people in the sector the company is performing in. In return for this investment and support they receive equity of the company and are represented on the board of directors.³

Therefore, venture capitalists are cooperating with the firm, but also with external investors that put their money into the fund. Venture capital is often a form of limited partnership, which means that there are limited and general partners. The limited partners are presented by the outside investors that invest in funds of general partners, the venture capitalists.⁴ Limited partners are for example banks, insurance companies or pension funds. They have rights resulting of the partnership but also a limited liability of the management of the fund. The general partner is responsible for the management of the fund as he bears the full liability. To

¹ Amit, Brandner & Zott (1998), pp. 442-443

² Zider (1998), pp. 132-133

³ Coyle (2000), pp. 2-3, Sorensen (2007), p. 2725, Cumming & Johan (2009), p. 5

⁴ Sahlman (1990), pp. 473-488

sum up, the venture capitalist is an intermediary between the entrepreneur who needs financing and the external investors who put money into the venture capital fund.⁵

The typical venture-capital firm creates its portfolio of ventures or investments within the first three to five years of a fund. After this investment stage they tend not to select more new ventures. They try to make cash out of the already existing investments, which is divided among the limited partners afterwards. After the allocation of the money, a new fund is raised. In most cases, the venture-capital firm invests several times during the venture's life cycle into a company, depending on its need of additional capital.⁶

2.1 Venture's Life Cycle

Entrepreneurs go through different stages associated with various sources of financial capital in their venture life cycle⁷.

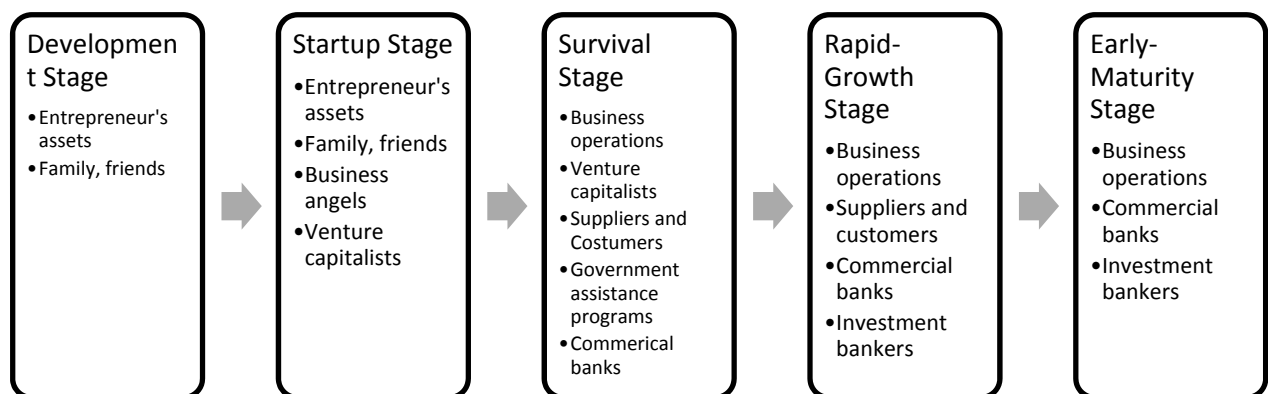


Figure 1: Venture's Life Cycle⁸

At the beginning, the entrepreneur finds itself in the development stage, which is also called seed stage. At this point, he develops a business plan by creating a strategy. The name “seed stage” is derived from seed financing, which consists of funds that help the entrepreneur to get an impression whether his idea will be successful or not. The most prominent form of financing in this stage is the use of private money, but also friends' and family members'

⁵ Cumming & Johan (2009), p. 4

⁶ Sahlman (1990), pp. 488-503

⁷ Leach & Melicher (2011), p. 29

⁸ Based on Leach & Melicher (2011), p. 24

support plays an important role. It is not very common that business angels or venture capitalists invest in such an early stage.⁹

When a firm enters the second stage of the venture's life cycle, the so-called startup stage, it has already developed a business plan, has a management team and has set its first financial statement. At best, it has already generated its first profits. The firm has already taken the initial step of developing a feasible strategy. Startup financing should help implementing this strategy through production and sales. For this purpose the entrepreneur's private capital and the money of his friends and family may not suffice and the firm will need to consider attracting external investors. Especially because at this point the cash outflows are often much higher than the inflows, firms will be dependent on external equity financing. The financial source in this stage is venture capital. This money can be provided by either business angels – individuals that invest into small businesses - or venture capitalists.¹⁰

In the next stage, the survival stage, the entrepreneur will find out whether the venture is successful or not. At this point the external equity financing is called first-round financing. This money should be used for commercializing the innovation when there is lack of cash. There are various possibilities for investors. An important financing source are suppliers and customers. They can be asked for trade credit - capital provided by suppliers in the form of granting a deferred payment - and accelerated payment incomes. Additionally, there exists financial assistance of governments for small businesses in form of loans at lower interest rates and tax shelters. At this stage, even banks become possible capital providers although this source needs securities. Therefore, ventures are more likely to obtain debt financing from banks later on in their venture's life cycle. Of course, also venture capitalists and business angels remain as investors.¹¹ Actually, venture capital firms do not tend to invest frequently into start-up companies. They prefer entering after the first stages when the basic idea already has been developed and the company or the entrepreneur begins to commercialize it. Furthermore, they try to avoid investing into projects in later stages, when the likeability of decreasing growth rates due to competition and other factors increases.¹²

In the rapid-growth stage, revenues and cash inflows increase faster than expenses which results in a positive value. But the sudden rise in revenues can also imply an increase in inventory expenses and accounts receivables. Consequently, external financing is needed.

⁹ Leach & Melicher (2011), pp. 23-29

¹⁰ Leach & Melicher (2011), pp. 25-29

¹¹ Leach & Melicher (2011), p. 26

¹² Zider (1998), p. 132

Here, the most important financial sources are suppliers and customers, commercial banks, business operations and investment bankers. The second-round financing takes place in the rapid-growth stage and is usually realized through venture capital. Mezzanine financing and liquidity- stage financing are other common forms in this stage.¹³

The last stage of the venture's life cycle is the early-maturity stage which is defined by a continuing but slower growth of revenues than before. At this moment, the exit strategy is decided (see chapter 2.3). In general, an exit can be realized through sale or merger, but of course there is the possibility of continuing and therefore extending the maturity stage. At this point, external financing is not that essential as before. The venture can offer seasoned securities to the public, if it already issued publicly traded securities before.¹⁴

2.2 The Investment Process

The investment process of venture capitalists in total consists of seven steps¹⁵:

1. Due diligence
2. Selection of a stage and an industry
3. Staging
4. Valuation
5. Syndication
6. Board seats
7. Contract creation

The starting point is the due diligence in which the venture capitalist reads up on several potential entrepreneurial firms and decides which of them are worth investing in.¹⁶ Due diligence is the process of screening the potential firms so that the investors have more reliable information about them. To this end, they examine for example reports and contracts very carefully.

After the screening of firms, the venture capitalist has to choose the stage in which he is going to enter the investment, but as well the industry. Venture capital plays a big role in the start-up

¹³ Leach & Melicher (2011), pp. 22-27

¹⁴ Leach & Melicher (2011), pp. 22-29

¹⁵ Cumming & Johan (2009), p.283

¹⁶ Cumming & Johan (2009), p. 283

and rapid-growth stage of the venture's life cycle. They do not only prefer certain stages of investments, but also specific industries, as for example companies in the IT or the biotechnological branch. Of course, this differs from investor to investor.¹⁷ Usually, it is written down in the contract of a venture capital fund in which stage and industry they invest in. The final decision may vary due to changes in the market.¹⁸ The decision for a certain stage can depend on the stock market and the IPO market which is connected to their exit strategy (see chapter 2.3). The liquidity risk is defined by "the risk of not being able to effectively exit", which implies that the exit will be postponed or that the shares have to be sold at lower prices. When the liquidity risk of exit markets is high, venture capitalists tend to invest in "high-tech and early-stage projects" with the aim of delaying the exit requests. On the contrary, they decide to invest into more proceeded ventures when the exit market is liquid so that they can take advantage of it.¹⁹

The next possible step in the investment process is staging. Staging allows the venture capitalist to minimize its risks and to enhance monitoring. The total amount of money is not provided in advance, but in stages. The venture capitalist and the entrepreneur will agree on benchmarks which have to be met in order to receive the next stage of financing. For the case that the firm is not able to fulfill the expected criteria, a recalculation and increased monitoring are probable. This strategy can avoid losses. Compared to upfront financing, staged financing increases profits of promising entrepreneurial firms. In the case of less promising firms, venture capitalist could underinvest in the initial stages which can imply losses in the further process. Most entrepreneurs agree to stage financing because they are convinced that they will be able to meet all the criteria. Staging is also linked to agency problems (see chapter 4).²⁰

Another very important point in the investment process of a venture capitalist is the valuation. The venture capitalist has to make his own calculations of the true value of the investment, as many entrepreneurs are asking for too much or too little money.²¹ The valuation can underlie fluctuations as the pricing is closely related to the public market cycles. If new money is available in the funds, the calculated value can be too low.²²

¹⁷ Sahlman (1990), p. 489

¹⁸ Cumming & Johan (2009), p. 285-286

¹⁹ Cumming, Fleming, & Schwienbacher (2005), pp. 77-78

²⁰ Cumming & Johan (2009), pp. 286-287; Wang & Zhou (2004), p. 132; Sahlman (1990), p. 507

²¹ Cumming & Johan (2009), p. 288

²² Gompers & Lerner (2000), p. 281

Often venture capitalists decide to syndicate because it improves decision-making due to the availability of a second. Furthermore, it improves the possibilities of diversification, since the risk and possible losses can be divided between the syndicating investors. Chapter 4 will show that it can also be a measure to mitigate agency problems.²³

As mentioned before, venture capitalists typically receive a seat on the board of directors in return for their investment. This allows them to monitor and control the firm, and thus, to protect their invested capital.²⁴ The board membership depends on the stage of financing, on CEO turnovers and on the required grade of monitoring.²⁵ Usually, the venture capitalist does not receive any compensation in form of cash for his board ownership.²⁶

The final step in the financing process is the creation of the contract. In most cases, there are different types of contracts: a term sheet, a shareholder agreement and a subscription agreement. The term sheet deals with the expected conditions of the relationship and cooperation between the entrepreneur and the venture capitalist. It provides the basis for further work of lawyers on the final contract, which then is binding in contrast to the term sheet. The shareholder agreement refers to the final contract between the shareholders of the company that includes the venture capitalist. This agreement is legally binding. The subscription agreement is the final contract between the venture capitalist and the entrepreneur. It regulates the subscription of the shares.²⁷

2.3 Exit strategies

The last stage in which the venture capitalist is involved is the exit. Exit stands for the sale of the shares of the venture capitalist so that the firm becomes independent of the investor.²⁸

Venture capital is not a long-term financing form as the investments normally only last for two to six years. In the case of a limited partnership this time span prolongs to ten years and there is even the option to extend by a further three years. At the moment the investment is

²³ Cumming & Johan (2009), pp. 289-290

²⁴ Cumming & Johan (2009), p. 291

²⁵ Lerner (1995), pp. 301-318

²⁶ Sahlman (1990), p. 506

²⁷ Cumming & Johan (2009), p. 292

²⁸ Schwienbacher (2010), p. 389

made, the venture capitalist already accounts for the gains resulting of the exit event.²⁹ Therefore, investors include the possible exit strategies into the due diligence process prior to the investment decision. The outcome can be used to estimate the actual value and the quality of the investment.³⁰

The exit is of great importance for the investor because the value of the deal is basically the value of the exit. In return for investing into the company, the venture capitalists receive equity. To receive the money they have to sell their shares, especially when taking into account that they will not receive any dividends before. The sale of the shares is the exit of the investor because he is not the owner of the company anymore. This is the only possibility for the venture capitalist to get the return out of the investment. There are two important points concerning the exit: the type and the timing. In this thesis, I will only look at the type of exit as the timing is not relevant for this study.³¹

There are several possibilities how an investor can exit the venture. Basically, there are five types of exit: Initial Public Offering, trade sale, management buy-out, refinancing and liquidation. The different exit types have different consequences for both parties. This has already during the negotiations an influence on the financing conditions and the allocation of control rights.

2.3.1 Initial Public Offering

An exit through an initial public offering (IPO) is only possible if the company fulfills the prerequisites for a stock market listing. The requirements vary from stock exchange to stock exchange. Usually there are a required minimum number of publicly traded shares, total market value, stock price, and shareholders.³² In Austria, at the Wiener Börse the requirements are a total nominal amount of 2.9 million Euros, a minimum of 10.000 shares and public free float of 275,000 Euros.³³

The venture capitalist can list his private shares so that they are converted into public ones. For the investor this signifies that he can sell his shares at the market price. For that reason

²⁹ Cumming & Johan (2009), p. 5

³⁰ Schwienbacher (2010), p. 389-390

³¹ Schwienbacher (2010), pp. 389-390

³² Listing and Delisting Requirements

³³ Zulassung bzw. Einbeziehung

this exit strategy is regarded as the most promising one for venture capitalists. But this exit route has also advantages for the firm going public. Its image will be improved and there will be new possibilities of getting financed. A very important advantage, especially if compared with trade sale, is that the entrepreneur is very likely to remain having the control over his firm when offering the shares for the first time. Afterwards, he can lose this control. Furthermore, an IPO can motivate the employees and the management. Unfortunately, there are also disadvantages as for example the costs involved.³⁴

2.3.2 Trade Sale

Trade sale is another denomination for acquisition. It means that the company is bought by another firm. The venture capitalists receive cash in return for the sale. The big difference to an IPO is that the company does not have to meet any public prerequisites.³⁵

For the entrepreneur an acquisition or a merger has one big drawback: The buyer will try to gain the control of the company so that the entrepreneur suffers a loss. The ownership is newly structured.³⁶

A trade sale can also signify an exchange of shares. In this case the venture capitalists receive shares of a less risky company in return for the shares of the firm he wants to exit.³⁷

2.3.3 Management Buyout and Refinancing

A management buyout is also called repurchase. Here the entrepreneur buys back the shares of the venture capitalist. Refinancing, also called secondary sale, is defined by the purchase of the shares by a new institutional investor.³⁸ The difference between a refinancing and an

³⁴ Schwienbacher (2010), pp. 393-395, Schwienbacher (2005), p.4

³⁵ Schwienbacher (2010), pp. 395-396

³⁶ Schwienbacher (2010), p. 396

³⁷ Schwienbacher (2010), p. 396

³⁸ Schwienbacher (2010), p. 396

acquisition is that only the shares of the investors are sold. In an acquisition also those of the entrepreneur and all the other shareholders are part of the offered package.³⁹

Both strategies are criticized by Schwienbacher⁴⁰ as being only partial exits. Venture Capitalists usually tend to keep a part of their shares in order to proof that the firm has some standard of quality. The problem with these exit types is that they are mostly chosen when the firms did not meet the expected growth rates. Consequently, the investors would get rather low returns. Cumming and MacIntosh⁴¹ disagree partially. They have the same opinion about secondary sales but they point out that repurchases often are full exits. As the shares are bought back by the company itself information asymmetries do not occur and the help of the investors is not needed anymore. A partial exit is probable when the firm is not able to buy back all the shares due to a lack of resources.

2.3.4 Liquidation

Liquidation or write-off is of course not the desired exit route. Liquidation normally means that the firm failed. Again there exists the possibility of a full exit or a partial exit. In the case that the investors decide for a full write-off, there is no or hardly any hope left that the initial investment of the venture capitalists will be returned. When the investors write-off partially, they think that the firm still has some value left but not enough to engage as before. This is a clear signal for the missing quality of the project.⁴²

³⁹ Cumming & MacIntosh (2003), p. 514

⁴⁰ Schwienbacher (2010), p. 396

⁴¹ Cumming & MacIntosh (2003), p. 524

⁴² Cumming & MacIntosh (2003), p. 514, p. 524

2.4 Venture Capital in Europe

Venture capital has its origin in the United States, where it still has the greatest importance all over the world. In contrast, the situation in Europe is different. The venture capital market in Europe increased over the last period of time, but European venture capital funds cannot compete with those in the United States up till now.⁴³

The main reason for the differences between these two markets can be found in the past: A different institutional environment and legal differences in taxes and securities implied that the European VC market undertook a different development than that in the U.S.⁴⁴

Figure 2 shows the venture capital investment as a percentage of the GDP of selected European countries, but also of the United States. The data⁴⁵ from the year 2008 shows that United Kingdom has a very developed venture capital market. The same is true for Denmark. But also Ireland, Switzerland, France and Spain can keep up with the United States. Austria invested 0.03% of the GDP, which lies below the average of 0.1%. The reason for the differences in venture capital investments between single European countries can once more be found in institutional structures and tax regulations. However, looking at figure 2 gives the impression that Europe caught up with the United States.⁴⁶

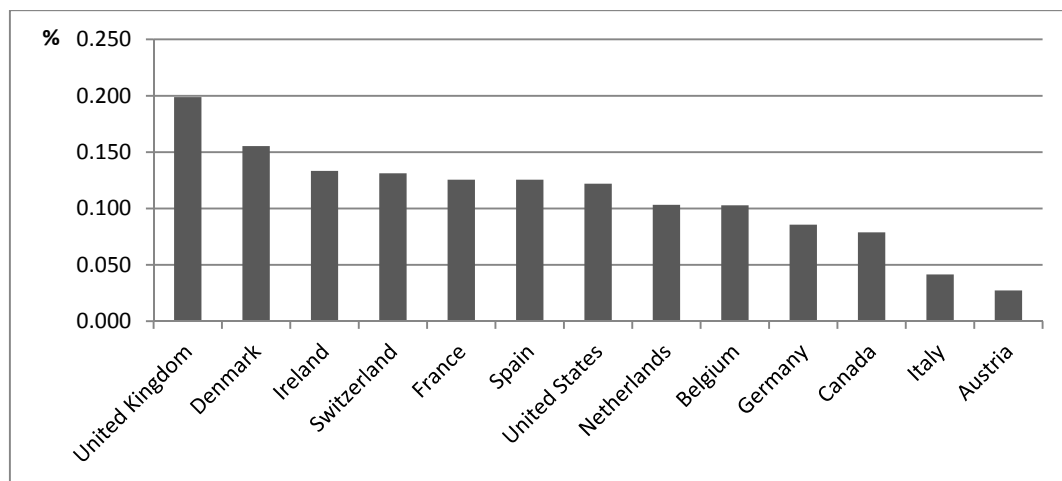


Figure 2: Venture Capital Investment as a Percentage of GDP (2008)⁴⁷

⁴³ Oehler et al. (2007), p. 7

⁴⁴ Oehler et al. (2007), p. 3

⁴⁵ OECD (2010)

⁴⁶ Oehler et al. (2007), p. 5; OECD (2010)

⁴⁷ OECD (2010)

Nevertheless, there are differences between the investment behaviors of the two regions. Schwienbacher⁴⁸ detected that European venture capital funds often underperform compared with those of the United States. There are several reasons:

- Funds in Europe are monitored less frequently than in the U.S.
- The European market is less liquid concerning human capital and exit routes.
- Syndication occurs less often in Europe than in the United States, which implies higher risk. (see chapter 4)
- In Europe the use of convertible securities is more common.

Despite of these differences young venture capital-backed firms in Europe are very similar to those in the United States. If longer existing firms are compared, more differences can be observed.

⁴⁸ Schwienbacher (2005)

3. Agency problems

As always when two or more parties are involved, problems and disadvantages for one or more parties can appear. Thus, the relationship between the entrepreneur and the venture capital firm is characterized by lots of agency problems. A principal-agent problem refers to the situation in which the principal employs an agent although there is incomplete and asymmetric information. Agency problems occur when the agent does not act in the interest of the principal. These actions against the principal can be classified into various types: moral hazard, adverse selection, free riding, hold-up, trilateral bargaining, window dressing, underinvestment, asset stripping and risk shifting. Sometimes, it is possible to avoid agency problems by including certain clauses in the contract. But not all agency problems occur after signing a contract, as for example adverse selection may be a problem before. In general, agency problems can be avoided or at least mitigated by three methods: screening, monitoring and contracting.⁴⁹

In the case of venture capital the principal-agent relationship is slightly more complex than usually. The venture capitalist invests money into the company or the idea of the entrepreneur. Additionally, he offers advices and support and even has voting rights. Seen it from this perspective, the venture capitalist acts for the entrepreneur and therefore he is the agent, while the entrepreneur is the principal. But the entrepreneur can also be in the role of the agent, as he has to fulfill the expectations of the principal, the venture capitalist, in order to receive the required capital. Of course, there are also principal-agent problems between external investors and venture capitalists and between different venture capitalists, but here I just want to focus on the relationship between the entrepreneur and the venture capitalist.⁵⁰

⁴⁹ Cumming & Johan (2009), p. 32-36; Kaplan & Strömberg (2001), p. 426

⁵⁰ Cumming & Johan (2009), p. 34

3.1 Moral Hazard

Moral hazard means that the agent feels secure because of the support of the principal and therefore relies on his knowledge and his skills. Consequently, the agent does not exert himself too much. In the case of venture capital, effort is indispensable because the performance of the firm depends largely on the ambitions of the entrepreneur and the venture capitalist. Both, the entrepreneur and the venture capitalist, start acting opportunistically with the result that both lose.⁵¹

Another form of moral hazard refers to the problem of shirking. The venture capitalist is not able to supervise the distribution of the invested capital because the entrepreneur has more information about it. Consequently, the entrepreneur could retain part of the investment and use the money privately. In reality, he knows that there was no or less money invested into the project and that no or little profit will be generated. At the beginning the probability of success is equal for both parties, but shirking leads to an imbalance. Furthermore, the entrepreneur could gain privately from continuing business, which stops him from closing a business that does not generate profit.⁵²

Bilateral moral hazard or double-sided moral hazard is also very common in venture capital deals as both parties are agent and principal at the same time. It can arise at two points in the venture's life cycle. The first one is exactly what discussed above: Both parties reconsider thoroughly how much effort they should invest, which is called "bilateral effort-shirking". The second dangerous situation is the choice of an exit strategy. They either decide for going public through an IPO or one party (or even both) steals parts of the project, which is referred to as the "double-sided expropriation problem". Both types of moral hazard lead to a decrease in value.⁵³

Another form is multitask moral hazard. In these situations the agent has to fulfill several tasks, but not all of them are in the interest of the principal. This problem arises as a venture capitalist has duties as an agent of various firms because he does not only invest in one single

⁵¹ Cumming & Johan (2009), p. 35; Elitzur & Gavios (2003), p. 710

⁵² Bergemann & Hege (1998), p. 704-710; Wang & Zhou (2004), p. 132

⁵³ Fairchild (2011), p. 359-361

entrepreneur. Sometimes he might be more involved in one company than in the others, because he expects it to generate more profit or because it needs more support.⁵⁴

3.2 Adverse Selection

Adverse selection already arises before the signing of the contract. The problem consists in the attractiveness of certain types of contracts to certain people. For instance, debt financing attracts other entrepreneurs than equity financing. This can be observed when there are differences in the risk-level or expected mean return of two firms.⁵⁵

Two firms with the same average return but different levels of risk initially have the same returns distribution but then it deviates due to the risk-level. The entrepreneur that is more risk-friendly, often called “nut” is very likely to achieve a high return, but also the probability of failing is very high. The risk-averse entrepreneur has a high likelihood of obtaining a rather low return, but it is not very likely that he will go bankrupt. The consequence of this divergence is that the “nut” will prefer nonconvertible debt to equity financing. A risk-friendly investor that is successful would be better off by owning the total common equity and if the investor only holds nonconvertible debt. Otherwise, he would have to share the return with the investor. In the case of going bankrupt, the investor would have a senior right if he financed the entrepreneur with debt and therefore would get all the residual value. The entrepreneur itself only is liable for his investment and it is possible that he will soon be able to restart. The risk-averse entrepreneur cannot lose a lot because he is not expected to make great gains anyway. Therefore his opportunity costs of handing common equity to the venture capitalist are rather low.⁵⁶

If two firms have the same level of risk but different expected values, the situation is different. The entrepreneur with lower expected returns is called “lemon”. The starting point of their probability distribution is different, but the width is the same. Here, the lemon will tend to offer equity while the entrepreneur with higher expected returns prefers debt

⁵⁴ Cumming & Johan (2009), p. 36

⁵⁵ Cumming & Johan (2009), pp. 36-37

⁵⁶ Cumming & Johan (2009), pp. 37-39

financing. The reason lies in the amount of money the lemon would lose in bankruptcy if the venture capitalist holds debt and has senior rights to equity.⁵⁷

This points out the existence of an adverse selection problem: The offering of debt financing primarily attracts firms with high levels of risk, while the offering of equity financing attracts firms with low expected returns.⁵⁸

Also the use of high discount rates in evaluating the investment can cause adverse selection. It deters promising firms from asking for money of the venture capitalist and they decide to look for someone else. As a result, only firms without any other options are attracted by the venture capitalist.⁵⁹

3.3 Window Dressing

Window dressing describes the phenomena that someone looks better than he really is. The positive effects for the cheating firm are rather short-term, while the consequences for the betrayed party can involve high long-term costs. At the beginning, an entrepreneurial firm may seem to be promising leading to more capital obtained by the venture capitalist, but then it turns out to have a poor performance.⁶⁰

Especially stage financing motivates firms to pretend incorrect facts. The better the appearance of the firm, the more money they receive for the next stage. Therefore, entrepreneurs overstate expected sales for the next periods or cover up possible losses. The consequence for the venture capital firm is a decrease in payoff because of calculations based on wrong information.⁶¹

⁵⁷ Cumming & Johan (2009), p. 39

⁵⁸ Cumming & Johan (2009), pp. 37-39

⁵⁹ Sahlman (1990), pp. 511-512

⁶⁰ Cumming & Johan (2009), p. 42

⁶¹ Cumming & Johan (2009), p. 42; Cornelli & Yosha (2003), p. 2

3.4 Hold-up problem

The hold-up problem refers to the difficulties resulting from different levels of bargaining power of the two parties. The party that has the lower bargaining power is dependent on the other one, who can decide to “hold up” the weaker party.⁶²

The entrepreneur can be the party with higher bargaining power and therefore hold up the venture capitalist. This is the case if the success of the venture capital firm is dependent on the entrepreneur because of the large amount of money invested. Maybe this entrepreneurial firm is the only firm it invested in or the only one remaining profitable. This allows the entrepreneur to renegotiate the contract.⁶³

But also the venture capitalist can hold up the entrepreneur. If the entrepreneur does not receive money of other investors, the venture capitalist would be able to change the terms when entering a new financing stage. Maybe the entrepreneur is even bounded to this venture capitalist because of clauses in the contract. The investor, therefore, has a lot of possibilities to hold up the entrepreneur.⁶⁴

⁶² Cumming & Johan (2009), pp. 39-40

⁶³ Cumming & Johan (2009), pp. 40-41

⁶⁴ Cumming & Johan (2009), p. 41

4. Strategies to mitigate agency problems

These agency problems have to be mitigated in some way to make venture capital more attractive and more promising. As mentioned before there are three typical ways to achieve this: screening, monitoring and contracting.⁶⁵ Furthermore, I will look at staging and syndication in more detail.

Avoiding adverse selection problems is indispensable in venture capital as venture capitalists look for high-quality firms they can invest in.⁶⁶

For each agency problem other measures must be taken. The strategies listed before are not efficient for all cases.

4.1 Screening

Screening is a method to mitigate agency problems that is realized before closing the deal. The venture capitalists evaluate the firm and try to analyze it very detailed. Therefore, they collect information about the investment project. Normally, this happens within a due diligence and often the relevant information can be found in the business plan. Primarily, the investors are interested in the attractiveness of the investment, the management of the firm and the contract terms. Another important point is the risk. According to Kaplan and Per Strömberg⁶⁷ there are several factors that include risk: “market, technology, customer adoption, competition and, management”. They found out that uncertainty is mostly caused by management risk. In these cases, the investors often decide to add some team members.

Although venture capitalists invest a lot of time in screening, they never know everything about the entrepreneurs they are going to invest in. Due to these information asymmetries it is impossible to exclude adverse selection totally from venture capital. Screening often just means keeping the risk at a minimum. Detecting the risk of choosing a lemon is easier for them than collecting information about the risk of investing in a nut. Risk is more complicated than low returns are. The reason is that entrepreneurs tend to deemphasize the risk of their

⁶⁵ (Kaplan & Strömberg (2001), p. 426

⁶⁶ Cumming (2006), p. 155

⁶⁷ Kaplan & Strömberg (2001), pp. 427-428

business, but also that entrepreneurs usually do not have the tendency to intentionally build up lemons. Furthermore, the venture capitalist can detect a lot about lemons during the due diligence process. Finally, it is easier for an investor to compensate for the low return of a nut than reducing the level of risk due to its experience.⁶⁸ But venture capitalists should screen the company very carefully. The entrepreneur should not have the feeling that the venture capitalist will withhold much power. In this case, promising firms will look for another investor.⁶⁹

4.2 Monitoring

Another possibility to mitigate moral hazard is monitoring by the venture capitalist. This method is used after the signing of the contract. Usually, the investor has a seat on the board of the firm and can therefore observe what exactly the entrepreneur does. Especially when there is a management turnover the venture capitalist prefers adding someone to the board. A part of the monitoring and the collecting of information after investing is the support of the management. A replacement of the entrepreneur as a consequence is definitely possible. But most of this support takes place in terms of advises.⁷⁰ Monitoring is very costly because of the great amount of time and effort the venture capitalist has to invest.⁷¹

During the monitoring, the venture capitalist tends to use his control rights in order to reduce the private benefits of the entrepreneur. As mentioned before, going public includes some of these private benefits as for example keeping control over the firm. Consequently, the investor's behavior reduces the probability of going public. But of course, the monitoring can also add value to the firm. Advices to the management should help the firm to perform better, and therefore, reduce the likelihood of liquidation and provide incentives to strive an IPO. Another possible consequence of monitoring Schwienbacher points out is that the likelihood of liquidation will be increased. The presence of the venture capitalists on the board of the firm may reduce the effort of the entrepreneur.⁷²

⁶⁸ Cumming (2006), p. 158-159

⁶⁹ Sahlman (1990), p. 513

⁷⁰ Kaplan & Strömberg (2001), pp. 428-429

⁷¹ Tian (2011), p. 135

⁷² Schwienbacher (2005), pp. 6-7

As monitoring is more or less a fixed element of venture capital, I derived the following hypotheses:

Hypothesis 1: Venture capital improves the firm performance.

Hypothesis 1a: Venture capital increases the probability of going public and decreases the probability of liquidation.

One strategy that combines monitoring with the setting of incentives is staging. The compliance of certain requirements is necessary to obtain more capital, which entails more effort of the entrepreneur. In order to be able to assess if the entrepreneurs did well, the venture capitalist has to monitor his actions.⁷³ As a consequence of not being successful, the venture capitalist can refuse investing more money into the firm and thereby warn other potential investors.⁷⁴

4.3 Contracting

Contracting deals with the design of the contract between the entrepreneur and the venture capitalist. The investor may incorporate clauses that encourage the entrepreneur. In this way the venture capitalist can allocate the cash flow and control rights.⁷⁵

It is hardly possible to include a clause against moral hazard in a contract, but one can set incentives to make more effort. The contract could include a prohibition to continue working on the financed project after the expiration of the contract but for example leave it instead to the venture capitalist. If this clause is missing, the entrepreneur could try to attract other venture capitalists.⁷⁶

The effort of an agent increases with his residual claim, which is his share of earnings after all debt obligations have been met. The expected payoff will be divided between the two parties, the entrepreneur and the venture capitalist, which implies that putting effort in increasing the payoff always has a positive effect for the other party as well. Also the other side has to be noticed: If one party does not work hard enough, the company could fail although the other

⁷³ Wang & Zhou (2004), p. 148

⁷⁴ Sahlman (1990), p. 507

⁷⁵ Kaplan & Strömberg (2001), p. 426

⁷⁶ Bergemann & Hege (1998), p. 710

party tries hard to avoid this. Thus, it plays a big role how the equity is shared. If the venture capitalist owns a big stake of the equity, he has an incentive to try harder. The same is true for the entrepreneur. This also has to be considered when trying to solve the moral hazard problem: When the probability is high that the venture capitalist will put little effort into the firm, he should receive a fixed claim security as for example nonconvertible debt or nonconvertible preferred equity. Nonconvertible means that it cannot be converted into common equity. The venture capitalist will get a fixed payment as long as the entrepreneur can pay it, but he does not own equity. Also in the case of preferred equity, the venture capitalist is no owner of the firm. In the opposite case, if the venture capitalist is likely to work hard, he should receive some equity and ownership rights in form of common equity or at least of convertible securities.⁷⁷

To solve the problem of shirking the entrepreneur should only be remunerated in the case of success. This is the case if the venture capitalist holds a combination of common stock and debt or convertible securities. This means that he has senior rights if there was no success.⁷⁸

As long as entrepreneurs offer equity or debt as financing form, window dressing will always exist assuming that the contracts cannot be renegotiated. The only possibility to mitigate the problem is financing through convertible securities. The argument lies in the possibility that the venture capitalist who holds the convertible security could convert it as soon as he has the impression that the firm will not succeed. Consequently, the entrepreneur's stake of equity would decrease.⁷⁹

Venture capitalists avoid being restricted by the entrepreneur by writing clauses in the contract that include stock options for the entrepreneur. These options expire after several years or after fulfilling a certain goal. These clauses are also called vesting provisions. If the entrepreneur leaves the firm, the firm is allowed to buy back only unvested shares. The entrepreneur has an incentive to put effort in the business without holding up the investor. Furthermore, the venture capitalists can include in the contract that the entrepreneur has no permission to be engaged in other similar businesses after leaving the firm. This non-compete clause also reinforces the bargaining power of the venture capitalist. Both strategies have the aim to make the entrepreneur's leaving expensive.⁸⁰

⁷⁷ Cumming & Johan (2009), pp. 28-35; Elitzur & Gavios (2003), p. 719

⁷⁸ Bergemann & Hege (1998), pp. 705-706

⁷⁹ Cumming & Johan (2009), p. 310, p. 463; Cornelli & Yosha (2003), p. 2

⁸⁰ Cumming & Johan (2009), p. 41; Kaplan & Strömberg (2003), p. 292

4.4 Stage Financing

In stage financing there are certain requirements in order to receive more capital, which entails more effort of the entrepreneur. The venture capitalist provides money in single steps instead of handing over the total sum right at the beginning. These financing rounds are often tied to the different stages in the venture's life cycle. In order to be able to assess if the entrepreneurs did well the venture capitalist has to set milestones. Therefore, stage financing is a combination of monitoring and setting incentives to work harder.⁸¹ As a consequence it can be said that it is a replacement of intensive monitoring.⁸²

Stage financing is a form of sequential investment. According to Mölls and Schill⁸³ this is the realization of a sequence of investments with increasing amounts of money. Within this chain of investments there are no positive cash-flows. Sequential projects are characterized by a minimal and a maximal investment rate, which has to be paid as long as the investor does not abandon the project. The minimum investment rate can equal zero, which allows investing nothing at a certain point without irrevocable exit of the project.

In return for the investment, the venture capitalist usually receives convertible preferred shares. The calculation of the number of shares is based on the valuation of the project. In the case of the sale or the IPO of the firm these shares are converted into common stock.⁸⁴

4.4.1 Advantages

The reasons why venture capitalists decide to use stage financing are diverse. The most popular ones are the creation of incentives, the exit option, the mitigation of the hold-up problem, the added value and the gathering of information. Additionally, investors want to reduce the riskiness of a project by providing the money later.⁸⁵

⁸¹ Wang & Zhou (2004), pp. 147- 148; Cornelli & Yosha (2003), p. 1

⁸² Tian (2011), p. 133

⁸³ Mölls & Schild (2011)

⁸⁴ Fluck, Garrison, & Myers (2006), p. 6

⁸⁵ Wang & Zhou (2004), p. 131

Wang and Zhou⁸⁶ have shown that stage financing is more promising than upfront financing if the project seems to have potential from the beginning on.

- **Creation of incentives**

A big advantage of this method is the creation of incentives for entrepreneurs to accomplish certain goals. This can imply better performance of the entrepreneur, and consequently, it mitigates the problem of moral hazard by keeping entrepreneurs from shirking⁸⁷

- **Exit option**

Another reason for introducing stage financing is the exit option. Venture capitalists can decide at every stage if they want to continue financing the project or if they prefer terminating their investment. Often this decision is dependent on the completion of milestones. But having obtained the aim does not always imply the continuation of financing. The investors can as well choose to stop providing capital because of other reasons. If they observe a much stronger competitor in the market, they may see no sense in investing into a weaker player. On the contrary, the venture capitalist may provide additional money even if the milestone has not been met. In summary, the investors can evaluate the probability of success at every financing stage and draw the consequences. This external observation is very important as the entrepreneur itself would hardly close his business as long as he is still receiving money from investors. By monitoring venture capitalists can avoid spending money for bad projects. The importance of monitoring and being able to abandon the investment increases with the riskiness of the project. Not providing additional money means in the most cases that the firm has to be closed because other investors have been warned by the decision of the venture capitalist.⁸⁸

⁸⁶ Wang & Zhou (2004), p. 133

⁸⁷ Cornelli & Yosha (2003), pp. 1-2; Tian (2011), p. 133,

⁸⁸ Cornelli & Yosha (2003), p. 1; Wang & Zhou (2004), p. 132; Fluck, Garrison, & Myers (2006), p. 5

- **Mitigation of hold-up problem**

One benefit of stage financing is that it can alleviate the hold-up problem caused by the entrepreneur. The investment of the venture capitalist could result in a menace of leaving the firm by the entrepreneur. Stage financing implies that the investor provides less money at once so that the entrepreneur cannot leave the firm. This reduces the ability of the entrepreneur to hold-up the investor. Tian deviates that the number of rounds will be held large in order to mitigate the hold-up problem.⁸⁹

Hypothesis 2: The number of financing stages improves the performance of venture capital-backed firms.

- **Adding value**

Schwienbacher⁹⁰ argues that the value of the project will be higher with stage financing. Because of the single decisions at different stages there is less capital wasted. Schwienbacher states that this does not have any impact on the probability of liquidation as an exit route. But he points out that it has an influence when success is regarded as being dependent on the entrepreneur's behavior and its effort. If the entrepreneur has incentives for putting a lot of effort into the project, for example if he benefits privately from working hard, this reduces the probability of liquidation. He further argues that the entrepreneur benefits the most if the exit strategy going public is chosen. Therefore it can be expected that more IPOs occur when there is stage financing.

Hypothesis 3: Staging improves the performance of venture capital-backed firms.

Hypothesis 3a: Staging decreases the probability of liquidation, but increases the probability of IPOs.

⁸⁹ Tian (2011), p. 133

⁹⁰ Schwienbacher (2005), pp. 5-6

- **Gathering information**

Investors can learn a lot during the investment stages. They can gather information during the first stage and base their decision whether to continue investing on it. This means that the real option value of the project is increased by stage financing.⁹¹

4.4.2 Disadvantages

- **Window-dressing**

Unfortunately, there is also a disadvantage concerning the motivation of entrepreneurs obtained through stage financing: One negative consequence could be window-dressing. Entrepreneurs may only strive fulfilling the desired goal without thinking about the future of their business. The impression the investors will have is more important for the entrepreneur than the actual situation of the firm. Therefore, entrepreneurs tend to act short-term orientated. Consequently, the venture capitalist's decisions could be based on wrong, pretended information.⁹²

- **Underinvestment**

I mentioned earlier that stage financing is a good decision for promising projects. In the case of less promising ones it could lead to underinvestment in early stages. In the further progress, this could be the reason for the collapse of the project, which maybe could be viable if the venture capitalists had chosen upfront financing.⁹³

- **Costs of staging**

Another drawback are the costs of staging. Intensive monitoring alone can be very costly and also with stage financing there are high expenses involved. A large part of these costs are caused by negotiations and contracting. The different stages at which capital is provided

⁹¹ Tian (2011), pp. 135-136

⁹² Cornelli & Yosha (2003), pp. 1-2; Tian (2011), p. 133

⁹³ Wang & Zhou (2004), p. 133, p. 148

induce a higher number of negotiations than usual. Moreover, one single contract is not sufficient. Several contracts have to be drafted in order to regulate the financing of every single stage. But also the entrepreneur has to face costs. The lower amounts of capital provided at once can lead to low economies of scale, longer development cycles and, consequently, lags in market entry.⁹⁴

Before deciding for stage financing the costs have to be compared with those of monitoring. The costs of staging can be reduced by introducing few financing stages. Every additional stage causes additional costs because of negotiations and contracting. Tian states that the higher monitoring costs are, the more likely monitoring will be replaced by stage financing.⁹⁵

Venture capitalists will try to reduce the costs as far as possible. Consequently, they avoid a high number of stages. The associated costs would be too high.

- **Hold-up costs**

Furthermore, hold-up costs can arise. This point contradicts the advantage mentioned before, that the hold-up problem can be solved with the help of stage financing. Fluck, Garrison and Myers⁹⁶ argue that the investor holds up the entrepreneur by being able to stop financing the project at every single stage. In addition to that, the investor receives more shares if the value is rather low. That leads to a reduction of the stake hold by the entrepreneur itself. As a consequence, both lose because the entrepreneur's incentives to work effectively decrease with his stake. The resulting loss in value can be defined as hold-up costs.

⁹⁴ Tian (2011), pp. 133-135

⁹⁵ Tian (2011), pp. 133-135

⁹⁶ Fluck, Garrison, & Myers (2006), p. 6

4.5 Syndication

Syndication is another measurement to improve venture capital deals and mitigate agency problems.

Venture capital syndication is the alliance of more than one venture capital firm. In this case an entrepreneur is financed by a collaborating group of at least two investors. The definitions of syndication are not consistent in every point. In most of the literature available the investments of the different capital providers do not have to take place at the same stage of the financing process. But a few authors define syndication as the simultaneous provision of capital by more than one venture capitalist. The single venture capitalist firms coinvest, which means that they divide the amount of capital invested but also the resulting gain or loss.⁹⁷

In most of the cases there is a lead investor. This is the denomination for the first venture capitalist interested into the project, who attracts other venture capitalists to syndicate with him.⁹⁸ The syndicating investors then are called “passive investors”. Usually, the lead investor establishes the contact with the entrepreneur and gets an insight into the project and the management. Consequently, he is on the board of director. The passive investors are not concerned with the management. Sometimes the role of the lead and the passive investor can be switched, no matter who was the original initiator of the investment.⁹⁹

Syndication occurs not only with venture capital, but also with other financing forms. In fact, venture capital syndication is not very differently structured than joint ventures. Both are characterized by the cooperation of partners.¹⁰⁰

Regarding the ideal or the most common point of time to syndicate, the findings of diverse authors are highly divergent. Brander et al.¹⁰¹ states that syndication usually takes place right after the first investment by a venture capitalist. If a venture was financed by at least two investors, most times it received the capital of the second one within the year of the initial investment. This data is based on information about Canadian venture capitalists. According to them there are three types of syndication: The most popular one is syndication in the early growth stage. In this case the investments are simultaneously or within a very short period of

⁹⁷ Hopp (2010), p. 417-419; Manigart, et al. (2006), p. 131

⁹⁸ Brander, Amit, & Antweiler (2002), p. 424

⁹⁹ Ferrary (2010), p. 886

¹⁰⁰ Brander, Amit, & Antweiler (2002), p. 423

¹⁰¹ Brander, Amit, & Antweiler (2002), p. 429

time. The second type of syndication is not simultaneously. Here, the lead investor provides capital at the seed or startup stage, while others do not until later. The third type is the less probable. Here, the syndication takes place at the seed or startup stage. Deli and Santhanakrishnan¹⁰² found that syndication mostly occurs in the early or late stages of the venture cycle. During the expansion the probability of syndication is lower. Their argument is that in these stages help regarding human capital is needed at a high level. These findings contradict those of Brander et al. and those of Ferrary.¹⁰³ His result is that during the seed stage hardly syndication exists. His explanation is that entrepreneurs do not need big amounts of money at this stage. He finds that syndications occur more frequently in the later stages – the early stage, the expansion stage and the later stage. This is partly consistent with the findings of the studies mentioned before. Actually, it is a mixture of both, the results of Deli and Santhanakrishnan and the findings of Brander et al.

These findings are partly contradicting the venture's life cycle described in chapter 2. There it says that venture capital hardly occurs in the seed stage. As a consequence, syndication cannot often be introduced at this stage.

Deli and Santhanakrishnan¹⁰⁴ also state that the probability of syndication depends on the amount of capital needed by the entrepreneur. The higher the amount of money, the more likely venture capitalists will syndicate. Another finding is that during the early and late stages of the venture cycle the number of cooperating venture capitalists is especially high.

Hypothesis 4: The higher the amount of money required the higher is the probability of syndication.

Syndication is very popular in North America but also in Europe. Schwienbacher¹⁰⁵ found out that syndication occurs more often in the United States than in Europe and also that the average size of syndicates is larger. However, in Europe venture capitalists syndicate more often with regional partners or collaborate with the government. Schwienbacher concludes that the European market is “less liquid and less developed”.

¹⁰² Deli & Santhanakrishnan (2010), p. 558

¹⁰³ Ferrary (2010), pp. 900-901

¹⁰⁴ Deli & Santhanakrishnan (2010), p. 558

¹⁰⁵ Schwienbacher (2005), pp. 15-16

4.5.1 Advantages

There are a lot of motives for venture capital syndication. The most popular or at least the most often mentioned ones in literature are the sharing of risk, the increasing expertise, the value added to the project and the higher amount of capital available.

- **More expertise**

One reason for syndication is the evaluation of the project by more than just one investor, which leads to more expertise. This reason for syndication was first mentioned by Lerner.¹⁰⁶ Before the investment is made, or in the case of staging before further capital is provided, the entrepreneur's project is screened by different venture capitalists. After evaluating a firm or a project the venture capitalist may want to discuss his results and listen to opinions of other venture capitalists. Especially, if there are doubts about the project's quality, syndication can provide more information. Thus, syndication is a way to reduce information asymmetries. The combination of more than just one evaluation can lead to better decisions regarding the selection of an investment or regarding the financing of another investment round. Consequently, it can reduce the probability of providing capital to bad projects. The syndicating parties can learn from each other.¹⁰⁷ Brander et al.¹⁰⁸ found that additional opinions are only necessary when a project's quality is rather uncertain. If a project is regarded as good from the beginning on, syndication for this only reason is needless.

To Huy and Jaeger¹⁰⁹ point out the importance of syndication for foreign investors. It allows them to collaborate with local venture capitalists in order to better evaluate the venture's situation. They also emphasize that a better selection of investments should imply a better performance of the ventures backed by syndication.

Of course the advantage of more expertise is especially beneficial for young and inexperienced venture capitalists. They can learn from their partners in the syndication and build up recognition at the same time. Normally, they should not be able to finance a project

¹⁰⁶ Lerner J. (1994)

¹⁰⁷ Brander, Amit, & Antweiler (2002), p. 424; To Huy & Jaeger (2011), pp. 6-7

¹⁰⁸ Brander, Amit, & Antweiler (2002), p. 449

¹⁰⁹ To Huy & Jaeger (2011), p. 7

on their own. Not only because of missing money but also because of their lack of experience in evaluating investments, syndication is very attractive for them.¹¹⁰

According to Hopp¹¹¹ venture capitalists with a lot of industry experience decide for syndication more often. Of course, it seems more logical that inexperienced firms need partners as already mentioned before, but experienced ones benefit from their already existing network and the consequently better selection of partners. For them it is easier to find partners than for inexperienced young firms.

Screening is also mentioned as a measure against adverse selection. Venture capitalists that syndicate take advantage from information sharing and better screening. The due diligence process is more precise as the know-how and skills of all syndicated investors join together. This reduces information asymmetries and consequently also adverse selection.¹¹²

- **Diversification of risk**

Furthermore, literature often mentions the diversification of risk due to syndication. It is argued that every venture capitalist has only to bear his part of the risk. The logical consequence would be that risky projects are financed mostly by more than just one investor. Brander et al. showed that syndicated projects are usually risky because they have a higher volatility and higher returns.¹¹³

This again highlights hypothesis 4. It says that projects requiring a lot of capital more often need syndication.

Another way of diversifying the risk is to invest in more projects than just one. As the portfolio theory says the risk of a portfolio can be reduced by investing into a large number of investments which are not correlated with each other. Due to syndication enough capital remains to invest in other projects as well. Especially for smaller venture capital firms this opens up new possibilities. In that way they can invest into projects that require a huge amount of capital as well.¹¹⁴

¹¹⁰ To Huy & Jaeger (2011), p.9

¹¹¹ Hopp (2010), pp. 419-420

¹¹² Cumming (2006), p. 159

¹¹³ Brander, Amit, & Antweiler (2002), p. 449, To Huy & Jaeger (2011), p. 5

¹¹⁴ To Huy & Jaeger (2011), p. 4

Entrepreneurs can protect themselves by seeking money from more than just one venture capitalist so that the dependency on one capital supplier is reduced. Additionally, it is less probable that renegotiations with syndicating venture capitalists are started than with non-syndicated. This is explained by the amount of additional possibilities a syndicating venture capitalist has.¹¹⁵

- **Creating value**

Brander et al.¹¹⁶ found that syndication of venture capitalists implies higher rates of return than financing through a single investor. Therefore, syndication adds value. Also Checkley et al.¹¹⁷ point out that syndication improves the firm performance of ventures. They defined performance as “a firm’s annual share of IPOs generated, by share of exits, and by share of liquidations”. Tian¹¹⁸ showed that firms financed through venture capital syndication are more likely to exit successfully, which can be seen as a measurement for good performance. From that he derived that syndication leads to higher product and financial market values.

Hypothesis 5: Syndication improves the performance of venture capital-backed firms.

Hypothesis 5a: Syndication decreases the probability of liquidation, but increases the probability of going public.

The advantage of having more expertise due to syndication also points out that the performance will increase.

To Huy and Jaeger¹¹⁹ state, based on Lerner’s findings, that syndication does not have a positive effect on the performance of entrepreneurs. They give us the explanation, that a very promising venture will be financed by only one single investor. He would not ask other venture capitalists to syndicate when he is sure about a good outcome. Only if he is insecure about the quality but thinks that it can be successful, he will contact and try to attract other investors. Syndicating with them is better than being competitors. This points out the risk of adverse selection in syndication. The lead investor chooses his partners not only because of their money. He also wants to avoid competition. Consequently, To Huy and Jaeger came to

¹¹⁵ Cumming & Johan (2009), p. 290, p. 306

¹¹⁶ Brander, Amit, & Antweiler (2002), p. 450

¹¹⁷ Checkley, Higón, & Angwin (2010), pp. 195-197

¹¹⁸ Tian (Forthcoming)

¹¹⁹ To Huy & Jaeger (2011), pp. 7-8, pp. 27-28

the conclusion and also proofed that syndication has no or even a negative impact on the performance of the venture. Their data was based on French ventures. This finding contradicts those of Brander et al. and of Tian.

- **Providing more capital**

An obvious advantage of syndication is the ability of providing more capital. Especially, when a project needs more capital than one single venture capitalist can make available, syndication can solve the problem of suffering from a lack of resources. This is not only true for financial but also for human capital. As mentioned already before, venture capitalists do not simply offer money. In addition to that they also advise the management.¹²⁰

4.5.2 Disadvantages

Deli and Santhanakrishnan¹²¹ state that syndication does not occur more often than investments by just one venture capitalist. This implies that this strategy does not only entail advantages but also drawbacks. One downside are the agency costs.¹²²

However, there does not exist a lot of literature about the disadvantages of syndication in venture capital deals.

¹²⁰ Deli & Santhanakrishnan (2010), p. 561

¹²¹ Deli & Santhanakrishnan (2010), p. 562

¹²² Deli & Santhanakrishnan (2010), p. 562

5. Empirical Analysis

5.1 Description of Data

The data used for this analysis is from Venture Source. It contains data about 132 Austrian firms that received external financing. I excluded all firms that did not receive the capital from venture capital firms, but from business angels or individual investors. Furthermore, I eliminated investments which are financed through government grants, non-venture capital individuals, loans, other private equity, management buyout, corporate, secondary transaction or bridge loans.

In addition to that, I had to delete all financing rounds with missing data about investors. Sometimes it was not specified which investors provided the capital in a certain financing stage. This makes it impossible to include those rounds into my analysis. I did not know if the same investors continued financing which would indicate stage financing or if new investors entered which would stand for syndication.

An important point in my analysis is the stage of development in which the firms received capital from investors. As many firms out of the healthcare industry run through another development, I decided to exclude them. They run through different stages of clinical trials which are not comparable with the product development in other industries. Therefore, I could not assign them to stages in the venture cycle.

After this selection, there were 108 firms remaining that all together went through 186 financing rounds by venture capitalists. 30 of these firms are already out of business, 78 are still operating.

5.2 Methodology

To analyze the data I used STATA. The data provides the most important information which had to be transformed into an appropriate way to be analyzed with STATA. Therefore, I developed a table in EXCEL containing the variables required.

First of all, I made some basic calculations to derive general descriptive results. These results show the frequency of certain categories or numbers and if needed their mean, maximum and minimum values.

For deeper analysis I used regression analysis. This makes it possible to find a relationship between two variables. To start with this, I had to categorize the variables into metric, continuous, dichotomy or categorical. Depending on the type of variable, especially of the depending variable, I decided for a type of regression analysis. In the case of metric or continuous variables I used linear regression analysis, for dichotomous variables logistic regression and for categorical multinomial logistic regression analysis.

An important point here is the creation of dummy variables. In order to carry out the regression analysis I had to convert categorical variables into dummy variables. In addition to that, new variables had to be introduced. To find results concerning the impact of syndication and staging I first had to create dummy variables pointing out if the firm got staged or syndicated financing. Furthermore, I introduced a variable that indicates the total amount invested into a firm. The data just provided information about the amount invested in single rounds. Therefore, I summed up all the amounts of the relevant rounds. Unfortunately, there was some information missing. If the amount invested of one relevant round was missing, I did not sum up the residual values but left it out. This way these cases are treated as missing information.

5.3 Overview of hypotheses

Following, there is a short overview of the hypotheses made in the theoretical part of this thesis. The hypotheses are numbered consecutively.

Hypothesis 1	Venture capital improves the firm performance.
Hypothesis 1a	Venture capital reduces the probability of liquidation, but increases the probability of going public.
Hypothesis 2	The number of financing stages improves the performance of venture capital-backed firms.
Hypothesis 3	Staging improves the performance of venture capital-backed firms.
Hypothesis 3a	Staging reduces the probability of liquidation, but increases the probability of going-public.
Hypothesis 4	The higher the amount of money required, the higher is the probability of syndication.
Hypothesis 5	Syndication improves the performance of venture capital-backed firms.
Hypothesis 5a	Syndication reduces the probability of liquidation, but increases the probability of going public.

Figure 3: Overview of hypotheses

5.4 Descriptive statistics

The data provides information about the industry group of the firm, its current business status, its current stage of development, its stage of development at the financing round, the year the firm was founded, the close date of the financing round, the round type, the invested amount and the investors divided into lead and round investors.

The different industry groups the venture capital backed firms are operating in are Business/Consumer/Retail, Information Technology, Healthcare and Other. Unfortunately, the information about the industry group is missing for some firms. Out of the 108 remaining firms 20 operate in Business/Consumer/Retail, 54, and therefore the majority, in Information Technology, 22 in Healthcare and nine in other industry groups. About the remaining three firms we do not have any information.

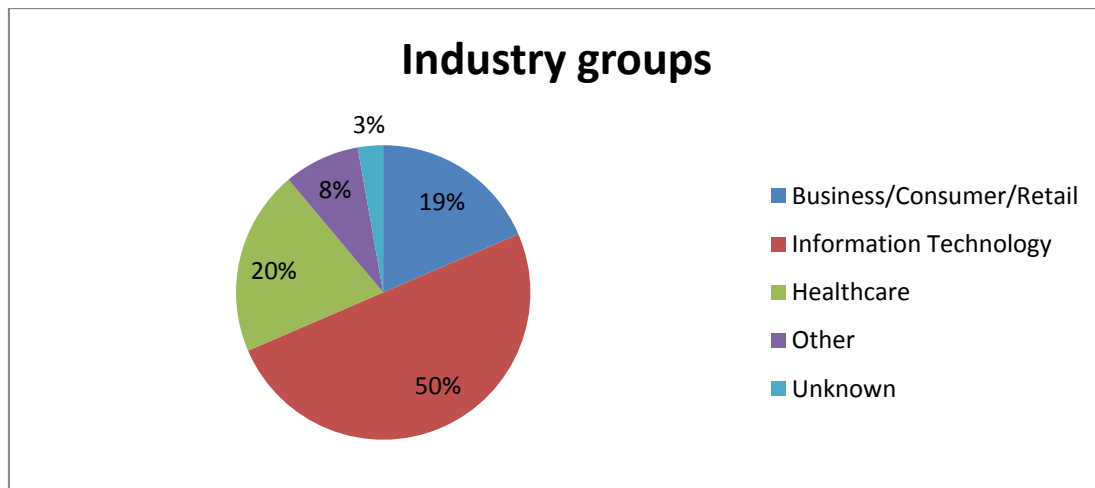


Figure 4: Industry groups

Another interesting information is the current business status. Here, there are the following categories: Acquired/Merged, Out Of Business, Private & Independent and Publicly-held. Most of the analyzed firms, 60 out of 108, are private and independent. 30 are out of business, and therefore, already stopped operating. 14 are acquired or merged and four are publicly-held.

Hypotheses 1 and 1a deal with the impact of venture capital on the current business status. Unfortunately, I have no data to compare the status of venture capital-backed firms with those of non venture capital-backed ones. How often a status occurs in this data does not tell enough to confirm or withdraw these hypotheses. However, one could say that “out of business” still occurs very often and it is doubtful that this is an improvement compared with non venture capital deals.

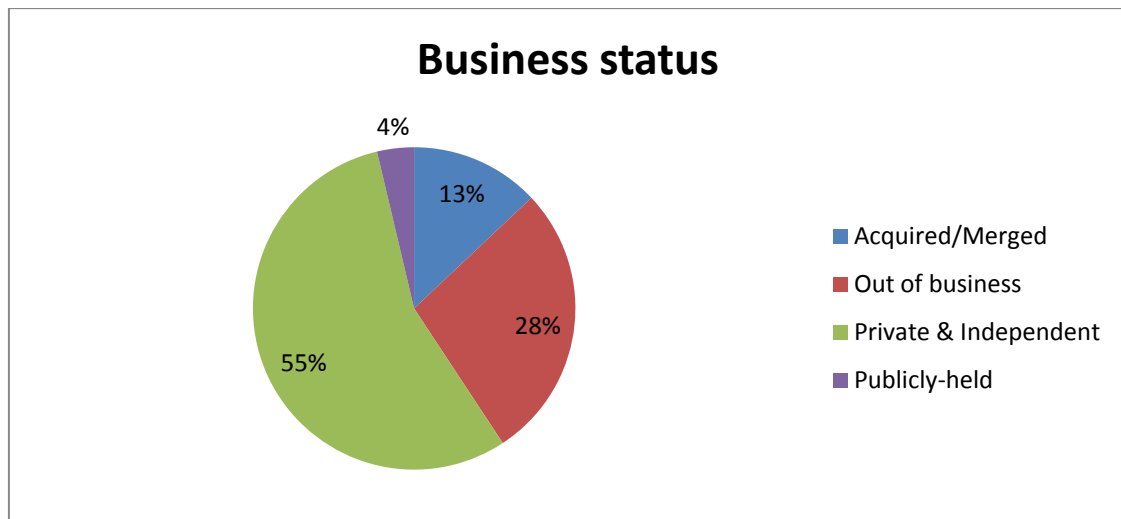


Figure 5: Business status

For analyzing the stage of development the stated stages have to be assigned to the different stages of the venture cycle. The data gives us information about the status of the product developed in the firm. Therefore the terms “Shipping Product”, “Profitable”, “Product Development”, “Product in Beta Test” and “Start-up” are used. We have information about the current stage of development and the stage of development at the round of financing. Currently, with 71 firms most of the products are in the shipping process. This can be interpreted as a good sign. It means that the development is more or less completed. 27 are profitable and ten are still in development. This seems to be a good result but first, the numbers have to be compared with the stage of development at the financing round. At this point 78 firms were in the shipping product, 24 in product development, four were a startup, one was in beta-test and one already profitable. This shows that now far more firms are profitable as before and only few find itself still in development.

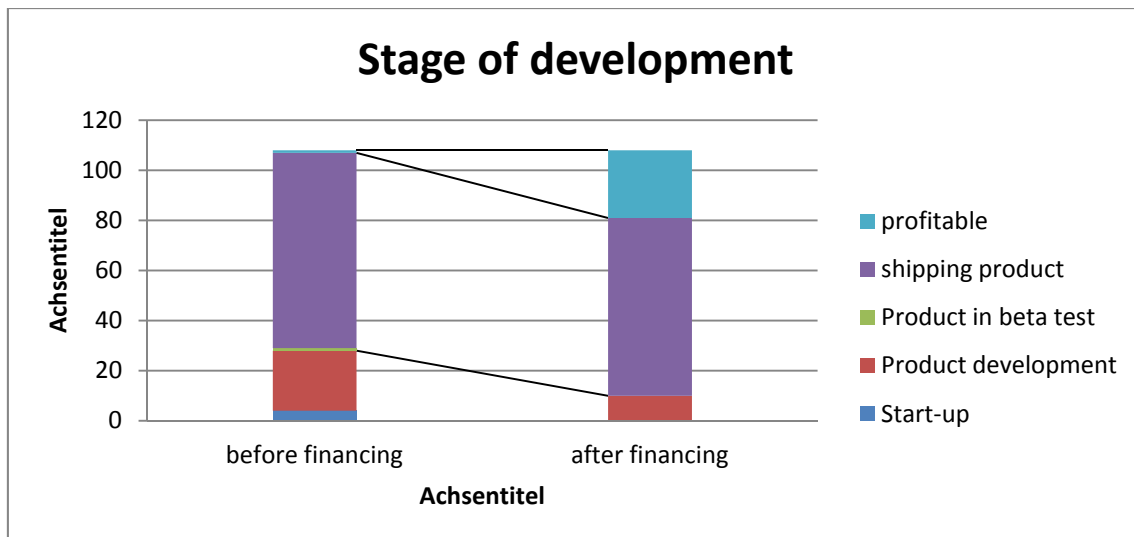


Figure 6: Stage of development before and after financing

Furthermore, the data contains the round type. Here, it is distinguished between seed round, first round, second round and later stage. Normally, these round types can be brought in connection with the stage of development. As already mentioned, I sorted out all other round types as for example second transaction. With a number of 91 most of the investments have been made in the first round. In the second round only one investment started. Five firms received their first capital already in the seed stage and eleven in the later stage.

In fact, the round types are linked to the stage of development. Start-up is the earliest stage which occurs in the seed stage. Product development takes place in the seed round and the first round. Product in beta test is part of the first round as well as being profitable. Apart from the first round being profitable can also be assigned to the later stage and the seed round. The shipping process can happen in all rounds.

Finally, the investors divided into lead and round investors show us how many of the investments have been staged or syndicated. These points are discussed below.

In addition to that, the data provides the amount invested for each round. I calculated the total amount invested for each firm. Therefore, I only took into account the rounds I did not exclude from the analysis. Unfortunately, some information is missing and I was not able to do the calculation for each of the 108 firms. For nine firms I have no results. The average amount invested is 6.74 million Euros. The minimum is 300,000 Euros and the maximum 137 million Euros. The standard deviation of 15.64 emphasizes the large range of invested capital.

5.5 The impact of the venture capital on performance

In order to analyze the impact of staging on the performance of venture capital-backed firms, I took a look at the current business status of the firms.

The current business status can be seen as a measurement of performance. Based on the description of the single exit strategies in chapter 2, I sorted them by their level of performance.

As an initial public offering only is possible if the firm fulfills certain requirements, it can be assumed that the performance of this firm has to be rather good. Especially as one of the usual requirements is a minimum market value, I would rank this exit strategy as the most performance-orientated one. Consequently, the business status *publicly-traded* is a sign for good performance.

That liquidation stands for poor performance is self-explanatory. The exit route liquidation here is equal to the business status *out of business*.

The business status *acquired/merged* is the consequence of the exit strategy trade sale. A firm will only be bought if the performance is acceptable, but it does not have to be that great as for an initial public offering.

Private and independent is difficult to classify. There is no information available if the firms still receive money from the investors or not. *Private and independent* therefore could mean that the financing is not yet completed. Therefore, it is not possible to make statements based on this business status about the performance of the firm.

As a consequence I list the different business status in descending order measured from their level of performance:

1. Publicly-held – very good performance
2. Acquired/merged – good performance
3. Private and Independent – unknown performance, but not too bad
4. Out of business – poor performance

Based on this ranking, *publicly-held* and *acquired/merged* can be pooled as business status that improve the performance. *Out of business* means that the probability of bad performance

decreases. In the further process, I denominated *publicly-held* and *acquired/merged* as good, *out of business* as bad and *private and independent* as unknown performance.

Unfortunately, I am not able to compare the performance of venture capital-backed and non venture capital-backed firms due to missing data. Instead I looked at the impact of the amount of money invested. If venture capital improves the performance of firms, the probability of good performance should increase with the amount invested.

First, I introduced the categorical variable *performance* with the three categories *good performance*, *bad performance* and *unknown performance*. Then, I did a multinomial regression analysis with *performance* as dependent variable and the *total amount* invested as independent variable. In the further process I looked at the average marginal effects. They give more information about the impact of one variable. The coefficients of a multinomial logistic regression analysis cannot be interpreted easily. The results show no significant relationships as all p-values are higher than the alpha-level 0.05. In other words, the probability of good, bad or unknown performance does not change significantly with the amount invested.

This withdraws hypothesis 1 which states that venture capital increases the firm performance.

```
. margins, dydx(*) predict(outcome(1))
Average marginal effects      Number of obs   =      99
Model VCE      : OIM
Expression      : Pr(performance==Good), predict(outcome(1))
dy/dx w.r.t.    : totalamount
```

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
totalamount	-.0034294	.0065647	-0.52	0.601	-.0162961	.0094373

```
Average marginal effects      Number of obs   =      99
Model VCE      : OIM
Expression      : Pr(performance==Bad), predict(outcome(2))
dy/dx w.r.t.    : totalamount
```

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
totalamount	-.0096048	.0086468	-1.11	0.267	-.0265523	.0073427

```
Average marginal effects      Number of obs   =      99
Model VCE      : OIM
Expression      : Pr(performance==Unknown), predict(outcome(3))
dy/dx w.r.t.    : totalamount
```

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
totalamount	.0130342	.0079815	1.63	0.102	-.0026092	.0286777

Figure 7: The impact of the total amount invested on firm performance

The same is true for other factors, as the industry group, the stage of development at the round of financing and the financing round. Again, no significant relationships can be found.

Average marginal effects
Model VCE : OIM
Number of obs = 97
Expression : Pr(performance==Good), predict(outcome(1))
dy/dx w.r.t. : first later second seed development beta profitable shipping startup totalamount Business Healthcare IT other

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
first	1.274956	654.8924	0.00	0.998	-1282.291	1284.841
later	1.273717	654.8924	0.00	0.998	-1282.292	1284.839
second	.1450163	1318.967	0.00	1.000	-2584.984	2585.274
seed	(omitted)					
development	.4226256	743.7773	0.00	1.000	-1457.354	1458.199
beta	-.9910346	991.004	-0.00	0.999	-1943.323	1941.341
profitable	3.138707	1498.958	0.00	0.998	-2934.765	2941.043
shipping	.6552277	743.7774	0.00	0.999	-1457.122	1458.432
startup	(omitted)					
totalamount	.0087771	.0067625	1.30	0.194	-.0044771	.0220312
Business	1.938011	164.1528	0.01	0.991	-319.7955	323.6715
Healthcare	1.892317	164.1528	0.01	0.991	-319.8412	323.6258
IT	1.828447	164.1528	0.01	0.991	-319.905	323.5619
other	(omitted)					

Average marginal effects
Model VCE : OIM
Number of obs = 97
Expression : Pr(performance==Bad), predict(outcome(2))
dy/dx w.r.t. : first later second seed development beta profitable shipping startup totalamount Business Healthcare IT other

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
first	1.12826	684.2172	0.00	0.999	-1339.913	1342.169
later	1.190802	684.2172	0.00	0.999	-1339.85	1342.232
second	5.619061	980.1716	0.01	0.995	-1915.482	1926.72
seed	(omitted)					
development	-1.983996	695.5333	-0.00	0.998	-1365.204	1361.236
beta	-2.350454	975.6643	-0.00	0.998	-1914.617	1909.916
profitable	-3.116535	3353.732	-0.00	0.999	-6576.311	6570.078
shipping	-2.121201	695.5333	-0.00	0.998	-1365.341	1361.099
startup	(omitted)					
totalamount	-.0441206	.0178091	-2.48	0.013	-.0790258	-.0092153
Business	-.6071795	58.17393	-0.01	0.992	-114.626	113.4116
Healthcare	-.7047652	58.174	-0.01	0.990	-114.7237	113.3142
IT	-.4482642	58.17394	-0.01	0.994	-114.4671	113.5706
other	(omitted)					

Average marginal effects
Model VCE : OIM
Number of obs = 97
Expression : Pr(performance==Unknown), predict(outcome(3))
dy/dx w.r.t. : first later second seed development beta profitable shipping startup totalamount Business Healthcare IT other

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
first	-2.403216	623.8293	-0.00	0.997	-1225.086	1220.28
later	-2.464519	623.8293	-0.00	0.997	-1225.147	1220.218
second	-5.764078	1357.379	-0.00	0.997	-2666.179	2654.65
seed	(omitted)					
development	1.56137	664.0646	0.00	0.998	-1299.981	1303.104
beta	3.341489	911.1231	0.00	0.997	-1782.427	1789.11
profitable	-.0221722	3408.858	-0.00	1.000	-6681.261	6681.217
shipping	1.465974	664.0646	0.00	0.998	-1300.077	1303.009
startup	(omitted)					
totalamount	.0353435	.0138048	2.56	0.010	.0082866	.0624004
Business	-1.330831	105.9792	-0.01	0.990	-209.0462	206.3846
Healthcare	-1.187552	105.9793	-0.01	0.991	-208.9031	206.528
IT	-1.380183	105.9792	-0.01	0.990	-209.0955	206.3352
other	(omitted)					

Figure 8: The impact of other factors on firm performance

Hypothesis 1a states that venture capital reduces the probability of liquidation, but increases those of going public. Basically, it has the same meaning as hypothesis 1. Nevertheless, I want to look at the two business status. Liquidation is here called *out of business* and going public *publicly*.

Average marginal effects
Model VCE : OIM
Number of obs = 99
Expression : Pr(status==Out_of_Business), predict(outcome(2))
dy/dx w.r.t. : totalamount

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
totalamount	-.0094695	.0086904	-1.09	0.276	-.0265023	.0075634

Average marginal effects
Model VCE : OIM
Number of obs = 99
Expression : Pr(status==Publicly), predict(outcome(3))
dy/dx w.r.t. : totalamount

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
totalamount	.0000854	.0023758	0.04	0.971	-.004571	.0047418

Figure 9: The impact of venture capital on the business status

Between the total amount and the two business status *out of business* and *publicly* there is no significant relationship. In both cases the p-value is higher than the alpha-level of 0.05. As expected this is basically the same result as in the regression analysis with the dependent variable *performance*.

Hypothesis 1a cannot be confirmed.

5.6 Impact of Staging

As mentioned before, staging has positive but also some negative effects. Altogether, it should occur rather often and lead to better performance.

The data does not point out which investments were staged and which not. Therefore, I decided to assume that all investments that have been financed by the same investors for more often than once are staged. Of course, it is possible that these investors did not plan to stage upfront but decided later on to provide more capital. Maybe the entrepreneur asked for more money although he already received all the capital upfront. However, as it is not possible to distinguish between these types, I had to assume that all of them are cases of staging. Furthermore, I counted how many stages they introduced. Once again, we do not know if all these stages have been planned before. Another problem I had to face was that within some firms more than just one investor provided the money in stages. In these cases, I only analyzed one investor and decided to take that one with the most stages.

For being able to analyze the impact of staging I introduced a dummy variable with 1 for staging and 0 for non-staging.

In this analysis, 44 firms are financed through stage financing by venture capitalist, which are 40,74 % of all 108 venture capital backed firms included in the data. This is less than expected as the advantages of staging clearly dominate the drawbacks.

5.6.1 The number of stages

Hypothesis 2 deals with the number of stages. It says that the number of stages improves the performance of venture capital-backed firms. This topic will be discussed later.

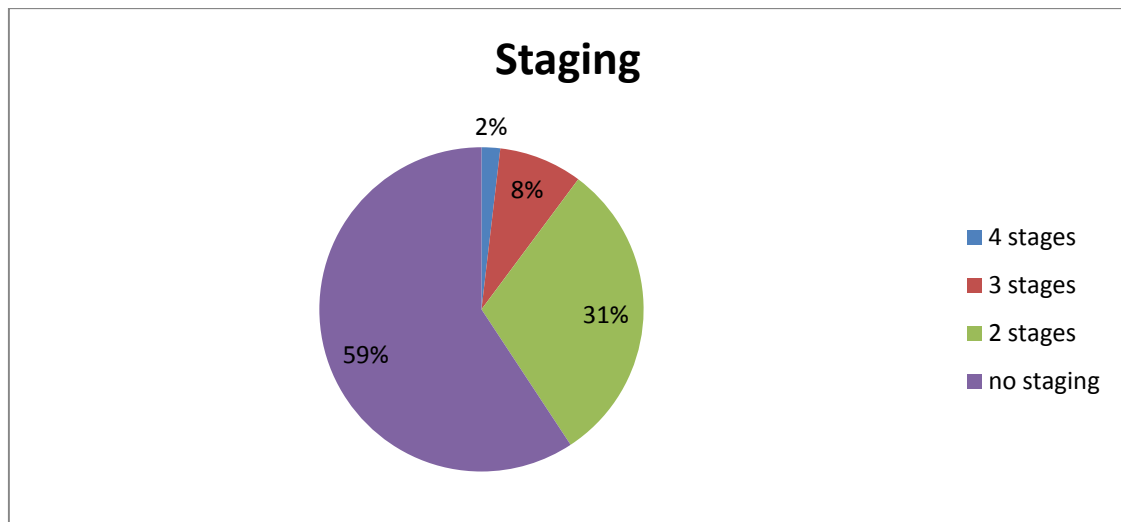


Figure 10: Staging

The maximal amount of stages in this data is four, but only in the case of two firms the venture capitalist invested in that many stages. Only nine firms received money in three stages. The remaining 33 firms got their capital divided into two stages.

This could lead to the assumption, that staging is not that prominent in Austria as it is in other countries. A connection with missing positive effects on the performance of the firms is probable.

With 33 firms out of the 44 financed through stages 75 percent receive the capital in only two stages. This is the minimal amount of stages possible.

Furthermore, I tested if the number of stages is dependent on the financing round it was introduced. It can be expected that if financing was started during the earlier rounds like seed or first round there occur more stages. The results below do not show a relationship. *Numberstages* is the dependent variable. As I use it as a categorical variable I ran through a multinomial logistic regression with the single round types as independent variables. The average marginal effects show no significant relationships as all p-values are higher than 0.05.

	Delta-method dy/dx Std. Err.	z	P> z	[95% Conf. Interval]		
first	-.6936729	159.4355	-0.00	0.997	-313.1815	311.7941
later	.2644438	184.9638	0.00	0.999	-362.2578	362.7867
second	3.026231	751.0919	0.00	0.997	-1469.087	1475.139
seed	(omitted)					

	Delta-method					
	dy/dx	Std. Err.	z	P> z	[95% Conf. Interval]	
first	-.6743134	81.222	-0.01	0.993	-159.8665	158.5179
later	-.2772784	94.22706	-0.00	0.998	-184.9589	184.4044
second	-3.445178	770.7698	-0.00	0.996	-1514.126	1507.236
seed	(omitted)					

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
first	1.119261	223.4229	0.01	0.996	-436.7816	439.0201
later	.010501	259.1967	0.00	1.000	-508.0057	508.0267
second	.3427745	569.7289	0.00	1.000	-1116.305	1116.991
seed	(omitted)					

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
first	.2487247	114.2903	0.00	0.998	-223.7561	224.2535
later	.0023336	132.59	0.00	1.000	-259.8694	259.874
second	.0761721	288.5605	0.00	1.000	-565.4921	565.6444
seed	(omitted)					

The average marginal effects do not show a lot of significant relationships. The p-value is only in two cases below 0.05, the alpha-level: There is a significant negative relationship between bad performance and staging. This means that staging decreases the probability of a bad performance by 23 percent. Furthermore, there is a significant positive relationship between unknown performance and staging. The fact that the probability of unknown performance increases by 20 percent under staging does not tell a lot about the impact of staging on performance. The null hypothesis for the relationship between good performance and staging cannot be withdrawn due to the high p-value. Therefore, it cannot be said that the relationship is significant. However, the effect of staging on the probability of good performance with three percent would be very small anyway. Looking at the other independent variables there cannot be seen one single significant relationship. The industry group, stage of development at the financing round and the financing round have no impact on the performance of the venture capital-backed firm.

Hypothesis 3 says that staging has a positive impact on the performance of venture capital-backed firms. On the one hand, this analysis shows that there is a slight positive impact as the probability of bad performance decreases with staging. This is of course an improvement. On the other hand, there is no significant relationship between good performance and staging. Therefore hypothesis 3 can only be confirmed partially.

Average marginal effects
Model VCE : OIM
Number of obs = 105
Expression : Pr(performance==Good), predict(outcome(1))
dy/dx w.r.t. : stage Business Healthcare IT other first later second seed development beta profitable shipping startup

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
stage	.0299423	.0672699	0.45	0.656	-.1019043	.1617889
Business	1.819901	157.4858	0.01	0.991	-306.8467	310.4865
Healthcare	1.796555	157.4859	0.01	0.991	-306.8701	310.4632
IT	1.715942	157.4858	0.01	0.991	-306.9506	310.3825
other	(omitted)					
first	1.07866	622.1902	0.00	0.999	-1218.392	1220.549
later	1.073261	622.1902	0.00	0.999	-1218.397	1220.544
second	.3286858	1285.601	0.00	1.000	-2519.402	2520.06
seed	(omitted)					
development	.5079784	703.7247	0.00	0.999	-1378.767	1379.783
beta	-.4900692	939.3343	-0.00	1.000	-1841.552	1840.571
profitable	3.153177	1678.436	0.00	0.999	-3286.52	3292.827
shipping	.7395212	703.7247	0.00	0.999	-1378.536	1380.015
startup	(omitted)					

Average marginal effects
Model VCE : OIM
Number of obs = 105
Expression : Pr(performance==Bad), predict(outcome(2))
dy/dx w.r.t. : stage Business Healthcare IT other first later second seed development beta profitable shipping startup

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
stage	-.2318445	.0887432	-2.61	0.009	-.405778	-.0579109
Business	-.5265595	56.52569	-0.01	0.993	-111.3149	110.2618
Healthcare	-.6500243	56.52575	-0.01	0.991	-111.4385	110.1384
IT	-.4308839	56.52569	-0.01	0.994	-111.2192	110.3574
other	(omitted)					
first	1.724122	686.2594	0.00	0.998	-1343.32	1346.768
later	1.817406	686.2594	0.00	0.998	-1343.226	1346.861
second	4.595646	1002.035	0.00	0.996	-1959.356	1968.547
seed	(omitted)					
development	-2.750576	696.3326	-0.00	0.997	-1367.537	1362.036
beta	-4.693839	977.6661	-0.00	0.996	-1920.884	1911.496
profitable	-3.778268	4327.124	-0.00	0.999	-8484.785	8477.229
shipping	-2.792315	696.3326	-0.00	0.997	-1367.579	1361.994
startup	(omitted)					

Average marginal effects
Model VCE : OIM
Number of obs = 105
Expression : Pr(performance==Unknown), predict(outcome(3))
dy/dx w.r.t. : stage Business Healthcare IT other first later second seed development beta profitable shipping startup

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
stage	.2019022	.08971	2.25	0.024	.0260739	.3777305
Business	-1.293342	100.9605	-0.01	0.990	-199.1724	196.5857
Healthcare	-1.14653	100.9606	-0.01	0.991	-199.0257	196.7326
IT	-1.285058	100.9605	-0.01	0.990	-199.1641	196.5939
other	(omitted)					
first	-2.802783	622.5895	-0.00	0.996	-1223.056	1217.45
later	-2.890667	622.5895	-0.00	0.996	-1223.144	1217.362
second	-4.924331	1354.558	-0.00	0.997	-2659.809	2649.96
seed	(omitted)					
development	2.242598	657.3034	0.00	0.997	-1286.048	1290.534
beta	5.183908	905.3537	0.01	0.995	-1769.277	1779.645
profitable	.6250906	4340.333	0.00	1.000	-8506.271	8507.522
shipping	2.052793	657.3034	0.00	0.998	-1286.238	1290.344
startup	(omitted)					

Figure 12: The impact of staging on performance

Again, I also looked at the business status *out of business* and *publicly*. There is a significant negative relationship between *out of business* and staging. The probability of being *out of business* decreases by 23 percent when staging occurs. This accords with the result of the analysis with performance as dependent variable. For *publicly* there is no significant relationship.

Hypothesis 3a can only be confirmed partially.

Average marginal effects
Model VCE : OIM
Number of obs = 105
Expression : Pr(status==Out_of_Business), predict(outcome(2))
dy/dx w.r.t. : stage Business Healthcare IT other first later second seed development beta profitable shipping startup

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
stage	-.2320702	.0884516	-2.62	0.009	-.4054322	-.0587081
Business	-.5682104	97.92089	-0.01	0.995	-192.4896	191.3532
Healthcare	-.556878	100.5635	-0.01	0.996	-197.6578	196.544
IT	-.4734609	97.9209	-0.00	0.996	-192.3949	191.448
other	(omitted)					
first	2.119203	1175.17	0.00	0.999	-2301.172	2305.41
later	2.351424	1175.572	0.00	0.998	-2301.727	2306.43
second	5.13485	1626.543	0.00	0.997	-3182.831	3193.101
seed	(omitted)					
development	-3.051793	1189.539	-0.00	0.998	-2334.505	2328.402
beta	-5.254412	1671.976	-0.00	0.997	-3282.267	3271.758
profitable	-4.083106	12397.87	-0.00	1.000	-24303.46	24295.29
shipping	-3.211741	1189.73	-0.00	0.998	-2335.039	2328.616
startup	(omitted)					

Average marginal effects
Model VCE : OIM
Number of obs = 105
Expression : Pr(status==Publicly), predict(outcome(3))
dy/dx w.r.t. : stage Business Healthcare IT other first later second seed development beta profitable shipping startup

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
stage	.0402815	.0384099	1.05	0.294	-.0350004	.1155635
Business	.4796552	157.041	0.00	0.998	-307.315	308.2743
Healthcare	-.0649035	177.5948	-0.00	1.000	-348.1443	348.0145
IT	.4283285	157.041	0.00	0.998	-307.3663	308.223
other	(omitted)					
first	-.6737276	615.9583	-0.00	0.999	-1207.93	1206.582
later	-1.208124	625.9334	-0.00	0.998	-1228.015	1225.599
second	-.8355506	1147.791	-0.00	0.999	-2250.464	2248.793
seed	(omitted)					
development	.5664511	671.0916	0.00	0.999	-1314.749	1315.882
beta	.7469467	907.1331	0.00	0.999	-1777.201	1778.695
profitable	.966174	5912.814	0.00	1.000	-11587.94	11589.87
shipping	1.089437	675.5112	0.00	0.999	-1322.888	1325.067
startup	(omitted)					

Figure 13: The impact of staging on the business status

Interaction effects

Another interesting question is if this relationship is dependent on other factors, as for example the industry the firm is operating in. In addition to that, the stage of development at the financing round could also have an impact on the relationship between staging and performance. The results of the regression analysis before did not show any relationships between these factors and performance. Therefore, I now want to look at different samples.

It would make no sense to look at every single category of each variable as this would not bring a lot of new results. Instead I picked out those that seem to be the most interesting.

Out of the single industry groups IT seems promising as venture capital often occurs in high-technology firms. Therefore it is possible that venture capital and consequently staging influences the performance of the firms in this sector more than usually.

	Delta-method dy/dx	Std. Err.	z	P> z	[95% Conf. Interval]
stage	.0379146	.0891197	0.43	0.671	-.1367569 .2125861

	Delta-method dy/dx Std. Err.	z	P> z	[95% Conf. Interval]
stage	-.359067 .1072028	-3.35	0.001	-.5691807 -.1489534

	Delta-method dy/dx Std. Err.	z	P> z	[95% Conf. Interval]
stage	.3211524 .1026865	3.13	0.002	.1198905 .5224143

Average marginal effects
Model VCE : OIM
Number of obs = 91
Expression : Pr(performance==Good), predict(outcome(1))
dy/dx w.r.t. : stage

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
stage	.0224002	.0754314	0.30	0.766	-.1254427	.170243

Average marginal effects
Model VCE : OIM
Number of obs = 91
Expression : Pr(performance==Bad), predict(outcome(2))
dy/dx w.r.t. : stage

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
stage	-.2499872	.0938387	-2.66	0.008	-.4339077	-.0660668

Average marginal effects
Model VCE : OIM
Number of obs = 91
Expression : Pr(performance==Unknown), predict(outcome(3))
dy/dx w.r.t. : stage

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
stage	.227587	.097305	2.34	0.019	.0368728	.4183012

Figure 15: The impact of staging beginning in the first round on the performance

For financing under staging that was introduced in the first round there are significant relationships with bad and unknown performance. Again, the probability of bad performance decreases, this time by 25 percent.

Average marginal effects
Model VCE : OIM
Number of obs = 108
Expression : Pr(performance==Good), predict(outcome(1))
dy/dx w.r.t. : numberstages

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
numberstages	.0375792	.0455131	0.83	0.409	-.0516249	.1267832

Average marginal effects
Model VCE : OIM
Number of obs = 108
Expression : Pr(performance==Bad), predict(outcome(2))
dy/dx w.r.t. : numberstages

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
numberstages	-.1962279	.0726289	-2.70	0.007	-.338578	-.0538779

Average marginal effects
Model VCE : OIM
Expression : Pr(performance==Unknown), predict(outcome(3))
dy/dx w.r.t. : numberstages

Number of obs = 108

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
numberstages	.1586487	.0690827	2.30	0.022	.0232492	.2940483

Figure 16: The impact of the number of stages on performance

Furthermore, I tested if the number of stages has an influence on the performance of the firm. As number of stages now is the independent variable I introduced it as continuous variable. The multinomial logistic regression shows that the p-values for bad performance and unknown performance are below 0.05. There is a negative relationship between bad performance and the number of stages. This implies that an increase in the number of stages of one decreases the probability of bad performance by almost 20 percent. In the case of unknown performance there can be observed an increase of probability by almost 15 percent. Between good performance and the number of stages there is no significant relationship.

This implies that a higher number of stages slightly improves the performance of venture capital-backed firms, but it does not increase the probability of good performance.

5.7 Impact of Syndication

As mentioned before, authors' opinions about the definition of syndication vary a bit. Some talk about syndication when more than one venture capital firm invest simultaneously, others think that syndication also occurs when more than one investor provides money regardless of when.

For this thesis I define syndication as the investment of more than one venture capitalist in one project independent from the close date. Again, the data does not tell us which investments have been syndicated. I took all firms that received money of two or more investors. This contains investments by more than one investor simultaneously, but also investments by several venture capitalists in different financing rounds. Another form is that the lead investor invested in the first round, and the others followed in the second round. Of course, it is not totally correct to say that all these investments are syndicated. Especially, if the investors operate in different stages they maybe never even spoke to each other.

In order to be able to make a regression analysis I integrated a dummy variable for syndication, where 1 stands for syndication and 0 for non-syndication.

Literature hardly mentions negative aspects of syndication. Therefore, I expected syndication to be very common.

53.7 percent of all venture capital backed firms are financed by more than one venture capitalist. This shows that syndication is not unpopular. Out of these 58 cases of syndication 38, almost two third, are of the type simultaneous. In 13 cases the fund investors follow in the second round and in seven cases the single investors seem to have nothing in common.

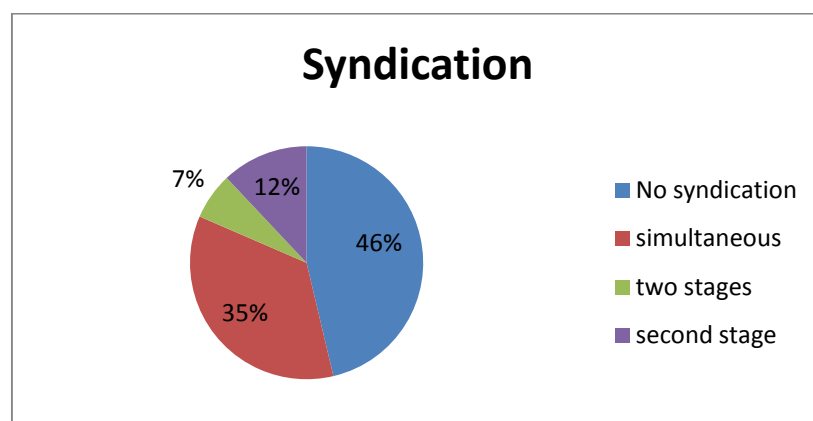


Figure 17: Syndication

5.7.1 The total amount of money invested

Now, I want to analyze if there is a connection between syndication and the total amount of money invested. *Syndication* is the dependent variable and *totalamount* the independent. It can be expected that the total amount invested has a positive impact on syndication (hypothesis 4). *Syndication* is a dummy variable with 1 for syndication and 0 for non-syndication and therefore categorical.

```
. logit syndication totalamount
```

```
Iteration 0:  log likelihood = -68.576109
Iteration 1:  log likelihood = -56.051375
Iteration 2:  log likelihood = -49.814525
Iteration 3:  log likelihood = -49.097359
Iteration 4:  log likelihood = -49.094877
Iteration 5:  log likelihood = -49.094877
```

```
Logistic regression               Number of obs   =      99
                                LR chi2(1)          =     38.96
                                Prob > chi2         =     0.0000
                                Pseudo R2           =     0.2841
```

```
Log likelihood = -49.094877
```

syndication	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
totalamount	.5144458	.1279286	4.02	0.000	.2637103	.7651813
_cons	-1.723648	.4340777	-3.97	0.000	-2.574425	-.8728718

Figure 18: The impact of the total amount invested on syndication

The logistic regression shows that the logarithmic likelihood of syndication increases by 0.514 when the total amount invested rises by one. As the p-level is equal to zero, the null hypothesis can be rejected. There is a positive relationship between syndication and total amount which verifies hypothesis 4.

5.7.2 The impact of syndication on performance

As already analyzed for staging I also want to find out if there is a relationship between syndication and the current business status. Hypothesis 5 predicts that syndication increases the performance. As described before, the business status can be used to analyze if there is an improvement in performance. *Syndication* is a dummy variable and is the independent variable. *Performance* is the dependent variable and categorical with three categories. Furthermore, I introduced the same additional independent variables as with staging. I made a multinomial logistical regression.

Again, there are only two significant relationships. There is a negative relationship between bad performance and syndication, which means that the probability of bad performance decreases when syndication occurs by almost 21 percent, while the probability of unknown performance increases by 22 percent. There are no further significant relationships.

Syndication improves the performance of venture capital-backed firms in terms of a lower probability of bad performance. This partially confirms hypothesis 5.

Average marginal effects
Model VCE : OIM
Number of obs = 105
Expression : Pr(performance==Good), predict(outcome(1))
dy/dx w.r.t. : syndication Business Healthcare IT other first later second seed development beta profitable shipping startup

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
syndication	-.002088	.0647713	-0.03	0.974	-.1290373	.1248614
Business	1.791074	139.2542	0.01	0.990	-271.1421	274.7242
Healthcare	1.769286	139.2542	0.01	0.990	-271.1639	274.7024
IT	1.690292	139.2542	0.01	0.990	-271.2428	274.6234
other	(omitted)					
first	1.020265	551.1415	0.00	0.999	-1079.197	1081.238
later	1.014397	551.1415	0.00	0.999	-1079.203	1081.232
second	.2379819	1134.341	0.00	1.000	-2223.03	2223.505
seed	(omitted)					
development	.5597122	622.4982	0.00	0.999	-1219.514	1220.634
beta	-.3815583	831.421	-0.00	1.000	-1629.937	1629.174
profitable	3.160814	1485.706	0.00	0.998	-2908.77	2915.091
shipping	.7836818	622.4982	0.00	0.999	-1219.29	1220.858
startup	(omitted)					

Average marginal effects
Model VCE : OIM
Number of obs = 105
Expression : Pr(performance==Bad), predict(outcome(2))
dy/dx w.r.t. : syndication Business Healthcare IT other first later second seed development beta profitable shipping startup

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
syndication	-.2156008	.077249	-2.79	0.005	-.367006	-.0641955
Business	-.5302778	52.09746	-0.01	0.992	-102.6394	101.5789
Healthcare	-.6392572	52.09753	-0.01	0.990	-102.7485	101.47
IT	-.4959286	52.09746	-0.01	0.992	-102.6051	101.6132
other	(omitted)					
first	1.725938	606.2266	0.00	0.998	-1186.456	1189.908
later	1.866552	606.2266	0.00	0.998	-1186.316	1190.049
second	4.763846	883.9942	0.01	0.996	-1727.833	1737.361
seed	(omitted)					
development	-2.548562	615.8183	-0.00	0.997	-1209.53	1204.433
beta	-4.417829	864.1429	-0.01	0.996	-1698.107	1689.271
profitable	-3.366413	3794.366	-0.00	0.999	-7440.187	7433.454
shipping	-2.571235	615.8183	-0.00	0.997	-1209.553	1204.41
startup	(omitted)					

Average marginal effects
Model VCE : OIM
Number of obs = 105
Expression : Pr(performance==Unknown), predict(outcome(3))
dy/dx w.r.t. : syndication Business Healthcare IT other first later second seed development beta profitable shipping startup

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
syndication	.2176887	.0810639	2.69	0.007	.0588063	.3765711
Business	-1.260796	87.15713	-0.01	0.988	-172.0856	169.564
Healthcare	-1.130029	87.15719	-0.01	0.990	-171.955	169.6949
IT	-1.194364	87.15713	-0.01	0.989	-172.0192	169.6305
other	(omitted)					
first	-2.746202	538.0774	-0.01	0.996	-1057.359	1051.866
later	-2.880949	538.0774	-0.01	0.996	-1057.493	1051.731
second	-5.001827	1170.34	-0.00	0.997	-2298.825	2288.822
seed	(omitted)					
development	1.98885	567.7444	0.00	0.997	-1110.77	1114.747
beta	4.799387	782.2155	0.01	0.995	-1528.315	1537.914
profitable	.2055986	3755.746	0.00	1.000	-7360.921	7361.332
shipping	1.787553	567.7444	0.00	0.997	-1110.971	1114.546
startup	(omitted)					

Figure 19: The impact of syndication on performance

Average marginal effects
Model VCE : OIM
Number of obs = 105
Expression : Pr(status==Out_of_Business), predict(outcome(2))
dy/dx w.r.t. : syndication Business Healthcare IT other first later second seed development beta profitable shipping startup

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
syndication	-.2120711	.0768642	-2.76	0.006	-.3627222	-.0614201
Business	-.5901266	107.7544	-0.01	0.996	-211.785	210.6047
Healthcare	-.5793116	110.0282	-0.01	0.996	-216.2306	215.0719
IT	-.5552925	107.7544	-0.01	0.996	-211.7501	210.6395
other	(omitted)					
first	2.140846	1254.181	0.00	0.999	-2456.009	2460.291
later	2.40405	1254.528	0.00	0.998	-2456.425	2461.233
second	5.382493	1734.286	0.00	0.998	-3393.756	3404.521
seed	(omitted)					
development	-2.911137	1271.043	-0.00	0.998	-2494.109	2488.287
beta	-5.076002	1785.504	-0.00	0.998	-3504.599	3494.447
profitable	-3.765221	13097.54	-0.00	1.000	-25674.47	25666.94
shipping	-3.039241	1271.205	-0.00	0.998	-2494.555	2488.476
startup	(omitted)					

Average marginal effects
Model VCE : OIM
Number of obs = 105
Expression : Pr(status==Publicly), predict(outcome(3))
dy/dx w.r.t. : syndication Business Healthcare IT other first later second seed development beta profitable shipping startup

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
syndication	.0447543	.0386657	1.16	0.247	-.0310291	.1205376
Business	.4823113	152.1656	0.00	0.997	-297.7567	298.7213
Healthcare	-.0525809	175.5102	-0.00	1.000	-344.0463	343.9411
IT	.4442212	152.1655	0.00	0.998	-297.7948	298.6832
other	(omitted)					
first	-.6471244	644.5681	-0.00	0.999	-1263.977	1262.683
later	-1.17596	654.9085	-0.00	0.999	-1284.773	1282.421
second	-.8344806	1203.222	-0.00	0.999	-2359.107	2357.438
seed	(omitted)					
development	.5444823	683.939	0.00	0.999	-1339.951	1341.04
beta	.6948047	935.7302	0.00	0.999	-1833.303	1834.692
profitable	.9126798	6202.363	0.00	1.000	-12155.5	12157.32
shipping	1.058806	688.5766	0.00	0.999	-1348.527	1350.644
startup	(omitted)					

Figure 20: The impact of syndication on the business status

The result is not very surprising: The probability of *out of business* decreases by seven percent when syndication occurs. This relationship is significant. For *publicly* there is no significant relationship. Hypothesis 5a can only be partially confirmed.

An interesting coincidence is that the results are very similar to those for the impact of staging. At this point, staging and syndication seem to influence to performance of venture capital-backed firms in a very similar way.

Furthermore, I analyzed how the single types of syndication influence the performance or if there is a relationship at all. I look at the two most important types *secondstage* and *simultaneous*. *Secondstage* means that the syndication takes places in the second stage after the lead investor already invested one stage earlier. *Simultaneous* means that the investors provide money simultaneously at the same stage.

The multinomial logistic regression analysis with *performance* as dependent and the two syndication types as independent variables does not point out any significant relationships. Thus, there seems to be no connection between the two factors.

Average marginal effects
Model VCE : OIM
Number of obs = 58
Expression : Pr(performance==Good), predict(outcome(1))
dy/dx w.r.t. : secondround simultaneous

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
secondround	-.4720022	68.0613	-0.01	0.994	-133.8697	132.9257
simultaneous	-.4667868	68.06123	-0.01	0.995	-133.8643	132.9308

Average marginal effects
Model VCE : OIM
Number of obs = 58
Expression : Pr(performance==Bad), predict(outcome(2))
dy/dx w.r.t. : secondround simultaneous

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
secondround	2.053365	356.5888	0.01	0.995	-696.8479	700.9546
simultaneous	2.080986	356.5888	0.01	0.995	-696.8203	700.9822

Average marginal effects
Model VCE : OIM
Number of obs = 58
Expression : Pr(performance==Unknown), predict(outcome(3))
dy/dx w.r.t. : secondround simultaneous

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
secondround	-1.581363	288.5278	-0.01	0.996	-567.0855	563.9228
simultaneous	-1.614199	288.5278	-0.01	0.996	-567.1183	563.8899

Figure 21: The impact of different syndication types on performance

Performance	LateSynd		Total
	0	1	
Good	16	2	18
Bad	30	0	30
Unknown	52	8	60
Total	98	10	108

Figure 22: Later syndication

Furthermore, I looked at the variable *latesynd* I introduced. This variable points out whether new investors entered a venture capital deal after a syndication already occurred. As the number of *latesynd* is rather low – it only occurs in ten cases – a regression analysis does not make sense. Figure 22 shows that two of these cases experience good performance, while we do not know anything about the performance of the remaining eight firms. As a consequence, it is not possible to make a statement about the impact of this type of syndication on the performance of venture capital-backed firms in Austria.

Besides, it is possible that the number of syndicated financing rounds has an impact on the performance of the firm. I counted the rounds in which a firm received money by more than one investor simultaneously. Of course, this analysis does not include the cases in which syndication occurs because of different venture capitalists investing in different stages. In this data there is a maximum of four syndicated rounds. Most firms (31 out of 108) that experienced syndication were financed by more than just one venture capitalist in only one round. 18 firms received the money in two rounds of more than one investor. Three or four rounds occur very rarely, each with one firm.

The multinomial logistic regression analysis with performance as dependent and the number of rounds as independent variable shows two significant relationships. Again, these are the same as in the analyses before: There is a negative relationship with bad performance. The probability of bad performance decreases by 18 percent with every additional syndicated round. The probability of unknown performance increases by 16 percent.

	Delta-method				
	dy/dx	Std. Err.	z	P> z	[95% Conf. Interval]
syndounds	.0208652	.0398154	0.52	0.600	-.0571716 .0989019

	Delta-method dy/dx Std. Err.	z	P> z	[95% Conf. Interval]
syndrounds	-.1843727 .05923	-3.11	0.002	-.3004614 -.068284

	Delta-method dy/dx Std. Err.	z	P> z	[95% Conf. Interval]
syndrounds	.1635075 .0559533	2.92	0.003	.0538411 .273174

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]
syndication	-.0955688	.1002017	-0.95	0.340	-.2919606 .100823

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]
syndication	-.1509232	.12129	-1.24	0.213	-.3886473 .0868008

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]
syndication	.246492	.1134879	2.17	0.030	.0240598 .4689243

Secondly, I took a sample of firms that received their first financing of a venture capitalist in the first round. Here, there is also a significant relationship between bad performance and syndication. The probability of bad performance decreases by 21 percent if syndication occurs. This is a much stronger impact on the performance than syndication has in all stages together. Consequently, syndication improves the performance of venture capital firms in Austria especially if the initial amount of money was provided in the first round.

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]
syndication	-.0326939	.0744551	-0.44	0.661	-.1786231 .1132353

	Delta-method dy/dx Std. Err.	z	P> z	[95% Conf. Interval]
syndication	-.2140132 .0799356	-2.68	0.007	-.3706841 -.0573424

Average marginal effects
Model VCE : OIM
Number of obs = 91
Expression : Pr(performance==Unknown), predict(outcome(3))
dy/dx w.r.t. : syndication

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
syndication	.2467071	.0863391	2.86	0.004	.0774856	.4159286

Figure 25: The impact of syndication in the first round on the performance

5.8 Staging and Syndication

Besides of the effect of staging and syndication as single measurements on the performance of venture capital-backed firms, it is also interesting to look at both factors together. In some firms not just one measure of those is introduced but both.

There are 38 firms that neither experienced staging nor syndication. Twelve firms were financed in stages but by only one venture capitalist and 26 received money of syndicated investors in only one stage. 32 investments out of 108 were both, staged and syndicated. Although this means, that more firms did only experience one strategy than both, with 30 percent a big part had the advantages and drawbacks of both methods.

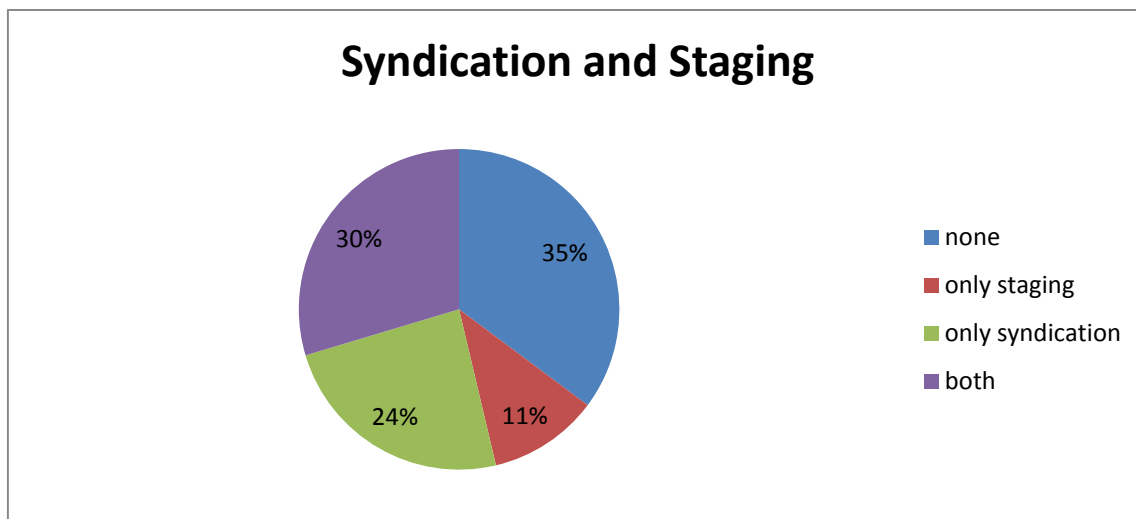


Figure 26: Syndication and staging

5.8.1 The impact of staging and syndication on performance

I analyzed if there is a relationship between having experienced both strategies, staging and syndication, and the performance. For this, I did a multinomial logistic regression analysis with *performance* as dependent variable and *stage*, *syndication* and *stage*syndication* as explanatory ones.

Average marginal effects
Model VCE : OIM
Number of obs = 108
Expression : Pr(performance==Good), predict(outcome(1))
dy/dx w.r.t. : stage syndication stagexsynd

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
stage	.0947587	.1100156	0.86	0.389	-.1208679	.3103853
syndication	.0807289	.0883872	0.91	0.361	-.0925068	.2539646
stagexsynd	-.1714391	.1474118	-1.16	0.245	-.4603609	.1174828

Average marginal effects
Model VCE : OIM
Number of obs = 108
Expression : Pr(performance==Bad), predict(outcome(2))
dy/dx w.r.t. : stage syndication stagexsynd

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
stage	-.1728	.126583	-1.37	0.172	-.4208981	.0752981
syndication	-.1930391	.0930835	-2.07	0.038	-.3754794	-.0105988
stagexsynd	-.0073269	.1867471	-0.04	0.969	-.3733444	.3586906

Average marginal effects
Model VCE : OIM
Number of obs = 108
Expression : Pr(performance==Unknown), predict(outcome(3))
dy/dx w.r.t. : stage syndication stagexsynd

	dy/dx	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
stage	.0780412	.1480564	0.53	0.598	-.2121439	.3682264
syndication	.1123101	.1127063	1.00	0.319	-.1085902	.3332104
stagexsynd	.1787659	.1975666	0.90	0.366	-.2084575	.5659894

Figure 27: The impact of staging and syndication on performance

The combination of both strategies to mitigate agency problems does not have the same significant relationships as if both are considered separately. There is no significant relationship with *bad performance*. Also for the other types of performance it cannot be said surely if there is a connection between the variables.

This is a very surprising result because I expected an even stronger impact on the performance of venture capital-backed firms if syndication and staging occur in the same project.

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5.9 Summary

The results of my empirical study are not very surprising. The hypotheses developed in the theoretical part of this paper have been mostly confirmed.

Unexpected for me was that there are no significant relationships between the total amount invested and the firm performance. This indicates that venture capital does not have an especially great impact on performance. Of course, I have no access to data of firms that did not receive any venture capital and consequently no possibility to compare venture capital-backed firm with others. Therefore, it is not possible to totally withdraw a connection between the venture capital and performance. A possible explanation is that venture capitalists add a lot of value to the firm by advising and supporting the management. Thus, the performance of the firm is not necessarily dependent on the amount invested but on other factors as well.

The methods staging and syndication brought up some surprises but most hypotheses were confirmed at least partially. Staging does not occur that often in venture capital deals as I would have expected because of its advantages. Syndication is more popular, which could be because of the missing drawbacks. Staging involves certain disadvantages while syndication hardly has any. Syndication occurs more often than staging, what could signify that venture capitalists in Austria need partners to provide the needed capital and that they want to reduce the risk involved. This assumption is strengthened by the finding that syndication occurs more often the higher the amount of money invested is.

It has been shown that in most cases staging just consists of two stages, which is the minimum possible amount. This can be explained by the costs caused by additional stages. This strengthens my assumption that the existing disadvantages of staging play an important role when deciding for or against it. In the case of syndication there is no distinction between the number of stages but between the timing of syndication. In most cases the syndication took place simultaneously, but this is not of importance for the performance of venture capital-backed firms.

This leads me to the main point of my empirical study. The main question was if syndication and staging have an impact on the performance of venture capital-backed firm. It was expected to have a positive impact, not only because this was supposed by literature but also because methods to mitigate agency problems should improve the deal, and consequently, the performance of the firm. However, there is a positive relationship between syndication and

performance, as well as between staging and performance. The fact that staging and syndication improve the performance at least a bit, shows that venture capital indeed has a positive effect on the firm performance. The interesting thing is that the results for both strategies are very similar. In both cases, the positive relationship is not very strong. Looking at the performance the relationship is only significant for bad and unknown performance. Bad performance tells us a lot, while unknown performance does not. Good performance which would provide us more information has no significant relationships with staging or syndication. Therefore it cannot be said that the performance improves a lot, but the probability of bad performance decreases in both cases by about a quarter. This of course also implies a better performance. Syndication has hardly disadvantages, which made it very unsurprisingly that it improves the performance. The effect could have been a bit stronger, but nevertheless it withdraws the idea of To Huy and Jaeger that syndication has no positive effect on performance. However, staging has also a positive effect on the performance of venture capital-backed firms in Austria. It does not occur that often as expected which possibly can be explained by the disadvantages it involves. Especially the costs of staging could discourage the investors. The improvement of performance shows that the advantages overtop the drawbacks.

Surprisingly, both strategies combined have no significant relationship with firm performance. It could have been expected that these firms take advantage of the positive effects of both strategies. Consequently, the improvement in performance should have been even stronger.

To sum up, the amount of money invested alone does not improve the performance of venture capital-backed firms in Austria. The improvement is made by the strategies that mitigate agency problems that usually occur within venture capital deals. Hence, it can be said that agency problems hinder venture capitalists from reaching a positive result. If these problems can be mitigated, venture capital is a financing method that enhances the entrepreneur's chances to succeed.

6. Conclusion

Venture capital in Europe is becoming more important and some European countries already seem to choose this financing form as often as or even more often than the United States. I analyzed the current situation in Austria. The main question of this thesis was whether a relationship between venture capital and firm performance exists.

International literature highlights different aspect of venture capital and authors developed various theories with different outcomes. However, the biggest part of academic research points out a positive impact of venture capital on firm performance. The same is true for the specific methods to mitigate agency problems staging and syndication. Unfortunately, there is hardly any information available about the current situation in Austria. There are already some papers about venture capital in Europe, but the range is still very limited. Because of this, I had to base most of the theory on American literature.

After developing some hypotheses based on the available literature on venture capital, I did an empirical study in order to confirm or withdraw them. The hypotheses suggested that venture capital in general has a very positive impact on the performance of the financed firms. In most cases my assumptions could be confirmed.

Generally, it can be expected that venture capital improves the performance of a firm. I draw the conclusion that the firm performance should increase with the amount invested by the venture capitalist, which I was not able to confirm. This may be due to my choice of the dependent variable. Besides of the capital invested, the venture capitalists also provide advises and support to the management. This also influences the performance of the firm. Unfortunately, I have no access to information about the impact of these factors. Anyway, this is a point which still can be analyzed and maybe lead to other results or even the confirmation of the hypothesis that venture capital improves firm performance. Another point here, which could be altered in further studies, is the measurement of performance. I decided to use the exit strategy or the current status of business as indicator for firm performance. Of course, there would also be the possibility to look on the firm value in numbers instead. This even makes it easier to look at the impact of venture capital and also points out slighter differences. Unfortunately, those numbers were not available for me.

The results for staging and syndication were not very surprising and indicate a positive impact of venture capital on performance. But of course there are still other factors which can be analyzed. One possibility would be to use a different definition of staging and syndication. As mentioned in the thesis my way is not the only one. But I think that this would not change the outcome significantly. Furthermore, it would be interesting to have more knowledge about the motives of choosing these strategies. In my thesis I mainly looked at the consequences but not on the reason, except for those mentioned in the theoretical part. However, I did not test whether the motives in Austria are the same. Again, there would be more data about the firms and deals needed.

To put it in a nutshell, venture capital is a very broad topic which was not paid a lot of attention in Austria yet. There are still a lot of question which have to be answered, especially for Europe and Austria. One big problem here is the missing information which makes it difficult to analyze the real consequences of venture capital on the performance of venture capital-backed firms. However, my results point out that venture capital does work in Austria as well even if the proofed impact on the firm performance is not very strong.

List of Abbreviations

IPO.....	Initial Public Offering
GDP.....	Gross Domestic Product
U.S.	United States
VC.....	Venture Capital

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Appendices

Appendix A: Abstract

The importance of venture capital has increased over time. At the moment the venture capital market which is especially interesting for start-up firms grows in the United States. European venture capital funds still cannot compete with Americans. This thesis focuses on the investment behavior and its consequences for the firm performance in Austria. The theoretical part discusses in detail how venture capital works and what agency problems can arise within this financing form. International literature already proposes lots of methods to mitigate them. Two methods which are discussed very detailed, both theoretically and within the empirical study, are staging and syndication. These play an important role for venture capital deals. Based on data of 183 Austrian firms that received venture capital it is analyzed how venture capital in general and specific strategies to mitigate agency problems influence the firm performance. Because of the findings of international literature it can be assumed that venture capital improves the performance of venture capital backed firms, as well as staging and syndication lead to better results. The empirical study of this paper confirms this only partially for the special case of Austria. A significant relationship between venture capital and the firm performance has not been found. But it has been proven that staging and syndication improve the firm performance indeed. Besides of these main effects also the general features of venture capital deals in Austria have been examined.

Appendix B: Abstract (German)

Venture-Capital (auch Risiko- oder Beteiligungskapital genannt) hat im Laufe der Zeit immer mehr an Bedeutung gewonnen. Momentan wächst der Markt für Venture-Capital in den Vereinigten Staaten, welcher besonders für Start-up Unternehmen interessant ist. Europäische Venture-Capital-Fonds können noch nicht mit Amerikanischen mithalten. Diese Magisterarbeit konzentriert sich auf das Investmentverhalten und seine Auswirkungen auf das Unternehmensergebnis. Im theoretischen Teil wird detailliert erörtert, wie Venture-Capital funktioniert und welche Vertretungsprobleme mit dieser Finanzierungsform auftreten können.

Die internationale Literatur schlägt bereits einige Methoden vor, um diese zu verringern. Zwei Methoden, auf welche besonders genau eingegangen wird, sind staging (stufenweise Finanzierung) und Syndizierung. Diese spielen eine bedeutende Rolle in Venture-Capital. Basierend auf Daten von 183 österreichischen Firmen, die Venture-Capital erhielten, wird analysiert wie Venture-Capital generell und spezifische Strategien innerhalb dieses Investment, die Vertretungsprobleme lösen sollen, das Unternehmensergebnis beeinflussen. Aufgrund der Erkenntnisse internationale Literatur kann angenommen werden, dass Venture-Capital das Ergebnis von Unternehmen verbessert, so wie auch staging und Syndizierung zu besseren Ergebnissen führen. Die empirische Studie dieser Arbeit bestätigt dies für Österreich nur teilweise. Es konnte kein signifikanter Zusammenhang zwischen Venture-Capital und dem Unternehmensergebnis festgestellt werden. Aber es wurde bewiesen, dass staging und Syndizierung in der Tat zu einem besseren Unternehmensergebnis führen. Neben diesen Haupteffekten wurden auch generelle Eigenschaften der Venture-Capital-Geschäfte in Österreich untersucht.

Appendix C: Curriculum Vitae

Persönliche Daten

Name: Marianne Archam, Bakk.
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Ausbildung

Oktober 2009 – voraussichtlich
Dezember 2011 Magisterstudium Internationale Betriebswirtschaft mit
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Oktober 2006 –
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September 1998 –
Juni 2006 Bundesgymnasium 11 Geringergasse

- Sprachlicher Zweig mit Französisch ab der 3. und Latein ab der 5. Klasse
- Abschluss: Matura mit ausgezeichnetem Erfolg

Berufserfahrung

Juni 2010 – Juli 2011 Assistentin der Geschäftsführung bei MEV Independent
Railway Services
Juli-September 2010 Vollzeit, sonst geringfügig

August 2009 Ferialpraktikum bei der Raiffeisenlandesbank Wien –
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Abteilung: Vertragsabwicklung Privat - und
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Juli 2009 Volontariat bei der Außenhandelsstelle der
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Englisch verhandlungssicher:

- Matura mit sehr gut
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Französisch gut:

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Nebenjobs Übersetzungstätigkeit in Spanisch und Französisch, Nachhilfe in Mathematik

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