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Summary

Technology start-ups which became successful and grew into multi-million companies “over-night” such as Skype, Google, Microsoft, Facebook or Groupon have attracted increased interest from many different directions. On the one hand, start-ups attracted the attention from governments since they recognised a high potential of job creation and growth for their economies from early-stage companies. On the other hand, practitioners and researchers are trying to understand the factors behind the success of such early-stage companies.

Venture capital investment professionals regard the profile of a potential investee company’ management team as one of the most important criterion underlying their investment decision. Additionally, given that venture capitalists understand the importance of larger networks and higher resources available, they often motivate additional investors to co-invest in investee companies, i.e. to enter an investors’ syndicate, in order to support the business building process on its way to success. Academic research examined these practises and showed a positive relationship between the levels of human capital on one hand and syndicated investments on the other hand, and the success of an early-stage company. Following these findings, the goal of this thesis is to evaluate if these findings also hold true for the European venture capital markets which have not been examined in much depth yet.

In order to analyse the influence of human capital and venture capital syndication, two sets of companies were selected from a large set of European venture capital backed companies. 22 overly successful investee companies were selected. The success criterions were a minimum exit multiple of 5x the venture capital investment and a minimum internal rate of return of 30% per annum which allowed to control for the holding period of an investment in addition to the return on capital invested. In contrast, a counter sample of 26 unsuccessful

investee companies was selected. These companies received significant volumes of venture capital investments, already completed their product and entered the market, however went out of business anyway.

These two samples were analysed and compared based on the education level, education relevance, professional experience relevance, previous start-up/entrepreneurial experience and previous senior management experience as factors influencing the level of human capital of the senior management team. The quality of investors involved, indicator for syndication, the overall number of venture capitalists invested per company and the average number of venture capitalists invested per investment round were used to analyse the syndication behaviour on the other hand. The two samples were analysed using a Mann-Whitney U test, since a student t test could not be performed due to lack of prerequisites for such a test. Contrary to previous academic research, the analysis in the thesis found little evidence of an influence of overall human capital level on the success of an early-stage company. Only a high education level and previous start-up experience showed a statistically significant influence. Also, no significant difference was found between the two samples when comparing the quality of investors on the success of a company. With regards to the influence of syndication, a significant difference was found, however the unsuccessful companies showed a higher level of syndication than unsuccessful companies which contradicted the hypothesised direction. Nevertheless, interesting observations were made on the investment and syndication behaviours. The companies in the successful samples were funded by a single investor and received less investment volumes in the first investment round and increased the investment volume and added syndication partners only in subsequent rounds. This observation shows a higher resource-consciousness and focus of the investors which practitioners regard as a prerequisite of the success of an early-stage company. It also supports the coaching view on the role of venture capitalists which are able to build successful

companies around a highly qualitative management team. The scouting view is supported by the venture capitalists buying into later stage rounds of successful companies and thus picking winners.

In retrospect, reflecting on the overall setup and the results of the analysis in this thesis, the companies examined represented a very narrow selection of venture capital backed companies in Europe and are analysed from a very narrow point of view. Aside from the requirement of success or no success of the companies which drove the constitution of the two samples, other factors like industry specifics such as capital intensive business models with long lead development times and highly competitive environments, might have been omitted. These factors may have contributed to a distorted picture in the analysis and thus further research into this field should account for much larger sample sizes and consider industry distribution.

Another factor may be the relatively young age of the European venture capital industry with a limited number of players with longstanding history and successful track record in venture capital investing possibly leading to a heterogeneous landscape of venture capitalists in this field.

1. Introduction

New technology-based firms (NTBFs) are an important source of new jobs and provide a crucial stimulus to national economies (Audretsch, 1995). Venture capitalists play an important role in an economy for at least two reasons. First, they incubate and/or enable new and small firms by providing them with equity financing (Sahlman and Gorman 1989). Second, they bring firms to public and thus increase their equity base to finance their future growth (Cumming and MacIntosh 2003; Kaplan and Stroemberg 2002; Hellman and Puri 2002).

This thesis aims to provide more insight into the investment and business building process in the Venture Capital (VC) industry. In particular it focuses on early-stage investments and risk mitigating strategies commonly pursued by VC professionals. Based on existing literature and collected empirical data, the effects of syndication of VC investors and the quality of the management of VC-backed companies on the success of the venture as measured by investment returns will be analysed. This thesis will examine the relevance of the current theoretical framework in the two focus areas, syndication of VC investors and quality of management team respectively, and will analyse whether they are related to superior company and thus VC investment performance.

2. Theoretical framework

2.1. Human factors in early-stage companies

2.1.1. Introduction

The fathers of modern management theory such as Henri Fayol and Peter Drucker set the ground for research in how senior management

executives are making decisions and what practices they use for running, growing and managing a business.

The shared belief of these early theorists that executives' actions and decisions have a direct influence on a business performance is what called management as a comprehensive scientific discipline into existence.

After that numerous theories on quality of management have emerged and been analysed. Starting with prescriptive methods used by their early predecessors who worked on establishing best practice rules, more recent research increasingly focusses on determining the traits and qualities of high-performance managers. Conventionally, this research was based on psychology around leadership and tried to apply the results of trait theory to a business environment. This work represents the roots of the human capital concept.

Several research studies have examined managers' human capital in large and mature corporations. Rajagopalan et al (2001) study three dimensions of CEOs' human capital, i.e. industry, firm, and functional specialization, on a large US manufacturing companies sample. Groysberg et al (2006) on the other hand test the relationships between CEOs' human capital and stock market valuation. Richard et al (2009) examine the impact of CEO traits on a sample of more than 500 banks. Other studies expanded the scope of analysis to the entire senior management team (SMT) recognizing close interaction between CEOs and their top executives: Certo et al (2006) examine SMT's heterogeneity with regard to organizational tenure, position tenure, function and education and attempt to link it to corporate performance.

The bottom line is that the aforementioned studies highlight an important relationship between the human capital of the management and the performance of large and mature corporations. Since the size of the employee base in start-ups is small, the employees lack established and efficient procedures and processes and the start-ups have limited

financial resources to acquire further talent, i.e. knowledge and skills externally, as compared to large and mature corporations, one could argue that human capital is of even higher importance in start-ups than in larger and more mature corporations.

2.1.2. Measuring human capital in early-stage companies

Many researchers focus on human capital. They have analysed a broad range of factors in an attempt to quantify human capital in young ventures and come up with appropriate metrics.

According to Becker's definition, human capital is defined as "skills and knowledge that individuals acquire through investments in schooling, on-the-job training and other types of experience" (Unger et. al. 2009). Becker examines human capital from two different angles: human capital investments such as education and work experience that may or may not lead to knowledge and skills versus outcomes of human capital investments which represent acquired knowledge and skills. Becker also differentiates between task-related human capital, e.g. running a business venture, and human capital not related to a task.

Other researchers such as Barringer et al (2005) focus on relevant industry experience, higher education, entrepreneurial experience and the size of managers' social and professional network as the respective metrics to quantify human capital. Varied levels of prior start-up founding experience, academic training, and social capital, i.e. direct tie to a VC and the ability of the founders to recruit executives from their own social network is analysed by Hsu (2007). Colombo and Grilli (2009) on the other hand examine the influence of founders' human capital on the success of NTBFs and use the founders' years of economic and/or managerial, scientific and/or technical education,

technical and commercial work experience in the relevant sector, work experience in other sectors and prior management positions as metrics.

Perhaps the most comprehensive current research in the field of human capital in NTBFs is provided by Unger et al (2009) who summarize and categorize three decades of human capital research in entrepreneurship. 70 independent studies were analysed with regard to their conceptualization of human capital, the success indicators used, the industries and countries analysed. Unger et. al. (2009) find that education (69 times), start-up experiences (31 times), industry specific experience (22 times), management experience (21 times) and, more generally, the amount of previous work experience (12 times) are the most frequently used metrics of human capital in the context of start-ups or small businesses. One can see that human capital investment metrics outweigh those of outcomes of human capital investments whereas low task-related metrics (i.e. general education and work experience) and high task-related metrics (i.e. start-up, management and industry specific experience) were approximately equally common.

The application of these factors in existing literature indicates a substantial relationship with human capital. The repetitive use of these metrics in examining various levels of human capital advocates a logical link in which the overall concept of human capital can be made up of the following major building blocks: education, entrepreneurial experience, experience in the respective industry and management experience.

The close link between high levels of human capital and positive company performance discussed in the previous section suggests that the same metrics indicating high levels of human capital – education, entrepreneurial experience, experience in the respective industry and management experience – will be a reliable indicator of company success.

2.1.3. Early-stage company performance and human capital

Unger et al (2009) find a positive link between human capital and start-up success. These results are reinforced by numerous other studies focussing on new venture performance. A UK self-employment research conducted by Taylor (1999 Survival of the Fittest) finds proof for a positive relationship between human capital and start-up survival. Likewise Bosma et al (2004) confirm that higher levels of, especially industry, entrepreneurship and social specific human capital are related to higher performance of small firm founders. Focussing on rapid growth as a measure of performance, indicated by market acceptance and firm success, Barringer et al (2004) analyse characteristics of 50 young rapid-growth and 50 slow-growth firms and point out several founders' characteristics that founders of rapid-growth firms have in common. Similar to that Colombo and Grilli (2009) compare 439 Italian NTBFs to identify several factors of founders' human capital associated with growth. Amason et al (2006) further elaborate on the reasons for some ventures to succeed whilst others fail by considering the fit between the senior management teams and the ventures they manage. They distinguish between ventures which look for innovation and new product creation and ventures which look to improve existing products. For both of these categories they determine the ideal composition of the senior management team, which is most likely to produce high venture performance.

2.1.4. Hypotheses for human capital

The thoughts above lead to the postulation of the following hypotheses:

- *H1 – Successful early-stage companies have higher levels of human capital compared to unsuccessful early-stage companies*

- *H2 – Successful early-stage companies have higher levels of education compared to unsuccessful early-stage companies, on an average basis*
- *H3 – Successful early-stage companies have higher levels of prior entrepreneurial experience compared to unsuccessful early-stage companies, on an average basis*
- *H4 – Successful early-stage companies have higher levels of industry experience compared to unsuccessful early-stage companies, on an average basis*
- *H5 – Successful early-stage companies have higher levels of management experience compared to unsuccessful early-stage companies, on an average basis*

2.2. Venture capital in early stage companies

For most of the twentieth century, venture capital as an industry was quite a new and unknown area of finance. It played a rather insignificant role in the considerations of business leaders and policy makers. However, with the rise of successful technology companies, such as Microsoft, Cisco, Google, Apple, Skype and many more – all of which were financed and supported by VC investors – to genuine behemoths of the global economy and the boom of the internet industry, Venture Capital quickly attracted growing interest from investors, both private and public, seeking superior returns and governments eying the creation of new jobs quickly created in rapid-growth companies.

The early success of the VC investors resulted in significant support for venture capital over the past couple of decades, both financially and politically. Still to most decision makers in business and politics the functioning of the venture capital industry remains unproven. In fact, to date there is no exact and unified definition of the venture capital industry.

In Europe, probably the best effort to outline and summarize the activities at outlining the type of activities which are assumed by venture capitalists has been made by the European Venture Capital Association (EVCA), the organisation representing the interest of the European private equity and venture capital industry, in its Venture Capital White Paper dated March 2010:

“Venture capital is a subset of a larger private equity asset class which includes seed, start-up, expansion, growth, buyout, bridge and mezzanine investments. A venture capital investment is a form of professional equity which is invested in unlisted companies together with the entrepreneur in order to provide seed or start-up capital, or to fund an expansion of the business. Such investments are also made by private equity firms, when expanding their respective horizon in order to capture new opportunities.”

2.2.1. Venture capital and human capital

If one asked venture capitalists what are the most important success factors based on which they assess and chose their investments there will be probably different opinions as one goes in depth and breadth. However the majority of venture capitalist will agree that the quality of the management team, the people behind a start-up, will rank among the top three, many will argue it's the most important factor for a start-up to succeed. Numerous academic studies confirm this statement. Silva (2004) finds factors relating to the skills, experience and the personality of the entrepreneur(s) to steadily achieve high weights in the decision-making process of venture capitalists. Meyerson and Agge (2008) interviewed top Life Science VCs investing in early-stage companies to analyse their investment process and decision making. Quality of management ranks among eight most important metrics for evaluating an investment into a company. Franke et al (2008) builds on the results of previous research on venture capitalists' evaluation and selection criteria and puts a special focus on the start-up team which

plays a key role. In twelve of the 13 studies evaluated, management characteristics ranked among the top three criteria for investment. According to Petty (2009) the “*characteristics of the entrepreneur or management team*” are among the four most important factors for VC investment managers’ decisions when evaluating investment opportunities.

2.2.2. Venture capital influence

There has been much discussion in the academic literature on venture capital investment and its effective and proven impact on portfolio or investee companies. Still today, there is mixed evidence and sentiment regarding venture-backed companies achieving superior performance when compared to their non-venture-backed counterparts. Engel and Keilbach (2007), based on a sample of young German early-stage companies, show venture-funded firms achieving growth rates roughly twice as high compared to non-venture-founded companies. Colombo and Grilli (2009) likewise observe venture capital investments having a highly significant impact on the growth of employment in VC-backed companies. Sorheim and Reistad (2009) demonstrate a positive influence on growth and the total asset value of venture-backed companies, on the other hand however weaker performance concerning profitability and efficiency. Controversially, Bürgel et al (2000) wouldn’t find any evidence at all for a positive association concerning venture capital backing and portfolio company growth.

As one can see there seems to be controversy concerning the impact and plausibility of the overall venture capital concept. This encouraged investigations into the substance of the venture capital concept as a whole. These investigations resulted in several studies examining the relationship between venture capitalists and entrepreneurs and effects of VC investments on investee companies. Naturally, the attention of the studies shifted from analysing the outcome of venture-backed

businesses on average to an attempt of deeper understanding of the key drivers of those VC investments which excelled.

Academic research gave rise to two opposing views on the role of venture capitalists in an attempt to give an answer to the question of how and foremost if venture capitalists add value to investee companies at all. One view advocates the *scouting* function of venture capitalists attributing the success of an investee company entirely to the venture capitalist's capacity to find and identify start-ups with a high-potential to succeed. According to the scouting function venture capitalists provide mostly financial resources but not much more than that. On the other hand the *coaching* view advocates that venture capitalists provide other than financial capacity like industry know-how, network, sparring and other added value which significantly contribute to and drive a start-up towards success. The coaching view doesn't attribute a major role to start-up selection but rather to a well-managed start-up post investment; which is controversial to the scouting view. Baum & Silverman (2004) carried out a first attempt in resolving the discussion of the opposing camps and found evidence for both positions: venture capitalists scout their investee companies with regards to the companies' products and technology. Nevertheless, venture capitalists coach their investee companies' teams on managerial topics and additions to human capital. The following research has supported the combined logic. The scouting view was linked with venture technology (Engel and Keilbach, 2006) and further evidence of the coaching view in connection with start-up management was produced (Colombo and Grilli, 2009).

The analysis suggested in this study does not take aspects of a company's product or technology into account and starts with the assumption that the company sample under examination was sufficiently filtered to warrant proof of concept for all companies studied. Therefore, the only variables of the examination in this study, which are endogenous to the venture, are the various factors of the venture management's human capital. Thus, the conclusion is that only the

coaching view of venture capital investment should be of relevance for this study and the postulation is that the value added by venture capitalists over the lifetime of their investment into a company will be a key determinant of success or failure.

Overall, the evaluation of the existing research suggests that venture capital investment does indeed create additional value for some companies. At the same time, venture capital investment cannot be associated with systematically superior performance of venture-backed over non-venture-backed firms; the additional value is created in particular through the addition of human capital and management skills by the venture capitalists. However, the size of the addition is likely to vary among venture capitalists, depending on their own human capital capabilities, the quality of their social and professional network for external acquisition of knowledge and skills and their experience. In the same way, Colombo and Grilli (2009) argue that “different types of VC investors e.g. less versus more experienced investors, independent VC funds versus corporate VC investors) are likely to have different “scout” and “coach” capabilities [...].”

2.2.3. Syndication of venture capital investments

Notwithstanding the differences between the various types of investors based on their experience level and/or organisational and dependency structure, it seems logical to assume that those investors, in particular venture capitalists who cooperate to combine their respective human capital pools will be adding considerably more value to their investee companies than any single investor on its own, assuming that the capabilities of the investors are sufficiently heterogeneous (Tian 2006). Considering the earlier discussions (see above) on higher levels of human capital among the start-up team members and its positive influence on the success of a start-up it seems that venture capitalists

should have a strong incentive to join forces and co-invest and form syndicates to invest in the same companies.

In addition to a natural incentive based on augmenting the human capital in a venture, syndication may be present when riskier investments are involved (Brander et al (2002), Hopp and Rieder (2006)) and in industries which are less mature and where more specific knowledge is generated, such as the biotechnology, pharmaceutical, medical, internet and software industries (Hopp and Rieder, 2005) where the investors attempt to diversify their portfolio and share risk among each other to mitigate possible negative outcomes on their overall portfolio but also provide better managerial advice to their investee companies. Considering these arguments in connection with the Unger et al (2009) findings according to which “human capital effects are higher in young businesses than in old businesses” leads to a prediction of a highly positive relationship between syndication and venture success.

Theoretically, there are two definitions of venture capital syndication that can be distinguished. The narrow definition considers those investments involving an investors’ syndicate which received funding by two or more investors in the same funding round. On the other hand, the broad definition defines those companies having an investors’ syndicate which received their funding from two or more investors, irrespective of whether or not the investors provided funding within the same funding round or over multiple funding rounds (Tian (2006), Hopp and Rieder (2006)).

In daily practice, investors’ syndication usually follows three major patterns (Brander et al, 2002):

- One lead venture capital investor invests in the first institutional round in an early-stage of the company (Seed or Series A round) with a follow-on investment round occurring shortly after which is where syndication occurs

- One lead investor invests in a seed or start-up round with syndication to follow at a later stage
- Syndication occurs already at seed or start-up stage

Data related to the number of syndicated investments vary. Brander et al (2002) show data for 1997 where 60% of all new Canadian investments were syndicated. Tian (2006) shows a syndication rate of 70% for all US venture-backed firms between 1980 and 2005. According to Lockett and Wright (2001), 30% of all venture capital investments in Europe and 60% in the US are syndicated. These differences however may not only stem from different time periods and regions analysed but also from different categorisation of investments and various definitions of syndication.

2.2.4. Motives to syndicate

A wide variety of motives and incentives of venture capitalists to syndicate an investment has been analysed and identified by academic research into venture capital co-investments. The main motives are sharing and reducing risks in connection with the selection (pre-investment) and post-investment management of investee companies by involving additional venture capitalists in the financing of a company. The following remarks will give more detail on the coverage of the above in the academic literature.

2.2.4.1. Traditional finance view

The traditional finance view (risk sharing) was developed from finance theory and sees syndication as a way of sharing the financing risk through portfolio diversification. It is based on the assumption that investors cannot influence the risk underlying a particular company, be it unique (non-systemic or company) risk or market (systemic) risk. Thus, the venture capitalists' only tool to manage and mitigate these

risks associated with asymmetric information is to create a well-diversified portfolio of investee companies. Especially for investors in early-stage companies with usually smaller fund sizes and thus limited resources to create large portfolios on their own, syndication of investments seems to be the only viable option to achieve a well-balanced portfolio and diversification of risk in the portfolio (Lerner 1994). Other motives for syndicating investments under the traditional finance view besides the asymmetric information include high illiquidity of the venture capital market when compared to public stock markets. This means that non- or underperforming investments cannot be easily divested which would allow portfolio adjustments achievable with public stock market investments. From this point of view, syndication gives the investors access to a broader array of deals and offers an opportunity to spread risk exposure across various transactions (Lockett and Wright 2001). Lehman (2006) finds empirical evidence for the above claims.

Obviously, the main criticism of the traditional finance view is that venture capitalists are in fact able to influence the company-specific risk given that they have important rights to strategically influence the direction of their portfolio companies.

2.2.4.2. Resource-based view

The resource-based view (risk reduction) is based on the assumption that “the firm is comprised of firm-specific assets or the assets over which the firm has control” and that of a venture capitalists of financial or tangible (equity) and non-financial or intangible resources, such as market information in order to reduce firm-specific risk (Lockett Wright 2001, Lehmann 2006). The two venture capitalists’ resources can be described in detail as follows.

2.2.4.2.1. Financial resources of venture capitalists

Venture capital funds have strict investment strategy, capital allocation rules and maximum investment sizes over the lifetime of the investment for each of their investee companies. These limits are applied in various investment rounds, venture capitalists keep a certain reserve for follow-on funding to protect themselves against dilution with the goal to keep their portfolios in balance. Nevertheless, as it often comes the funding requirements of an interesting high-potential investee candidate can go against these capital constraints. It would be then against the capital allocation rules of the venture capitalist to invest alone. According to the resource-based view the lead investor will approach further venture capitalists as co-investors to fill the overall required funding. This would imply that syndication largely prevails amongst smaller venture capital funds and in later stages of the investment cycle where transaction volumes are significantly larger than in seed or start-up investments. Academic research however delivers the opposite evidence. Hopp and Rieder (2006) findings show the fund size not being related to the tendency to syndicate. Casamatta and Haritchabalet (2007) show persuasive theoretical evidence of syndication occurring and dominating rather at earlier company stages.

2.2.4.2.2. Non-financial resources of venture capitalists

As already mentioned above the discussions of non-financial contribution of venture capitalists to their investee companies are largely dominated by the difference between the *coaching* and *scouting* views. The *scouting* perspective outlines that venture capitalists only take syndication into account when they need a second opinion on an investment opportunity, i.e. they look for an additional specialist opinion and they will trade off the value of this additional information and

perception wise a safer investment decision against the loss from future exit proceeds share since they are giving away a portion of the equity stake to the syndication partner which they could have acquired themselves. Consequently, syndication will be prevalent in investments with moderate performance since venture capitalists will keep the most prospective deals which show the most undisputable signals of highest potential themselves and therefore wouldn't require a second opinion (Lockett and Wright 2001, Brander et al 2002, Casamatta and Haritchabalet 2007). As opposed to this, the coaching view envisages that venture capitalists are going to seek partners in syndication for investees only when they lack certain resources (Verwaal et al 2008) and the additional managerial experience and skills brought by the syndicate partner is expected to bring more benefits when compared to the perceived loss from sharing exit profits. According to Brander et al (2002), the expected outcome for these syndicated investments is to be among the best performing ones, theoretically.

Hopp and Rieder (2006) reason that the resource-based and the traditional finance theories are not mutually exclusive. They highlight the fact that investors' syndication resolves the trade-off between a venture capitalist's investment activities in new investee companies and advisory capacities to existing investee companies by allowing venture capitalists to focus their advisory efforts on investees where they are in a lead investor role and providing specialist expertise while allowing for diversification into other industries where the syndication partners have domain expertise. Manigart et al (2006) as well examine the motives for syndication from both opposing views jointly and find varying findings according to geography (U.S. versus Europe) and deal stages. In Europe, they find portfolio management motives being more important than individual deal management motives for syndication. For both, early and later stage investors, risk sharing, diversification, and access to larger deals seem more important than deal selection and monitoring. Though, adding value to the investee companies seems a stronger motive for early stage investors.

2.2.4.3. Deal-flow reciprocation

In light of venture capitalists' deal-flow, the argument being made in this respect is that syndication is a property of venture capital networks. Deal flow is a crucial resource at the core of the business for every venture capitalist and syndication, i.e. one venture capitalist introducing a potential investment and inviting another venture capitalist to syndicate, is supposed to ensure future supply since the expectation is that this "favour" will be returned in the future. Nonetheless, the argument goes that not all venture capital firms are equally attractive syndication partners. Indeed, more reputable, experienced, larger and later-stage venture capitalists are more likely to be invited to a syndicate than early stage venture capitalist or venture capitalist with a shorter track record on the market.

2.2.4.4. Improved bargaining position

Theoretically, venture capitalists could be motivated to syndicate in order to improve their bargaining position with the entrepreneurs. The reasoning behind this is that venture capitalists rather than competing with each other collaborate together to create a stronger appearance when facing and negotiating terms of a financing with the entrepreneur (Brander et al 2002).

However, the motives for syndication outlined above are frequently lessened by additional factors.

2.2.4.5. Size of the venture capitalist fund

Large venture capitalist funds are more likely to have higher specialisation, to hire teams with higher qualification, are able to negotiate more favourable terms of the financing round for them and hence have relatively lower incentives to syndicate with other venture

capital firms while funds with less capital under management have higher pressure to enter into a syndicate in order to gain access to further deal flow and resources (Verwaal 2008).

2.2.4.6. Stage of investment and its influence on syndication

According to the resource-based view and its risk-reduction reasoning, early-stage investors are more likely to syndicate an investment opportunity given that the uncertainty of the venture's outcome in the future is higher, when compared to later-stage investors, where the future outcomes of the soon to be investee companies can be more assuredly predicted from their and that of comparable companies' past performance (Lockett and Wright 2001).

2.2.5. The influence of syndication on investee companies

Numerous researchers have linked a positive outcome of an investee company to venture capital syndication in their studies. Most studies also find substantial proof for superior performance of investee companies with an investors' syndicate when compared to companies backed by a single investor. The most notable studies and results can be summarized as follows:

Growth

Lehman (2006) examines company growth and defines it as the increase in the employees' numbers. He finds considerably higher growth rates for investee companies with an investors' syndicate than for companies backed by a single investor. Hopp and Rieder (2006) however, don't find any significant influence on employment growth in

their research paper. However, they show strong backing for a positive relationship on the companies' sales growth.

Performance

Tian (2006), in a comprehensive study of more than 30.000 companies which received venture capital financing between 1980 and 2005, finds that companies backed by a venture capital syndicate are more likely to achieve successful exits, receive higher IPO valuations, lower IPO under-pricing, achieve better post-IPO operating performance and have higher survival rates in the long-run. Hochberg et al (2007) reinforces these findings with results according to which the quality of a venture capitalist's network is significantly positively related with overall fund performance measured by successful exits through trade sale or IPO and the survival rates of investee companies till next financing round and/or exit. However, Walske et al (2007) examine the quality of venture capitalists' networks, suggesting that not all syndication partners are equally preferable and capable of producing superior returns in their investee companies. Instead, they illustrate that syndicate performance is not only dependent on whether a venture capitalist is an elite or non-elite firm but rather is dependent on the prior relationship history of the syndication partners. In other words, if the syndicate partners worked well together as a "team" before, it is more preferable than the status of the syndicate partner, i.e. elite vs. non-elite firm.

Assessing the degree of prior relationship history or teamwork and the quality of the working relationship within venture capital investors' syndicates is an undertaking that would exceed the scope of this thesis. Instead, the number of follow-on venture capital investments that were syndicated was chosen as a proxy variable to represent the investors syndicate's strength and quality. It is based on the assumption that more co-operative teams within an investors' syndicate are more successful in leveraging and combining their individual capabilities,

knowledge and networks. Therefore, such investors' teams will outperform inflexible investors' teams and are therefore more likely to continue co-investing in consecutive rounds, on average.

Risk

Numerous studies show that venture capital investors' syndicates tend to invest higher amounts (Tian 2006) in younger (Tian 2006) and riskier (Brander et al 2002) firms at higher valuations (Tian 2006) when compared to single venture capitalist investments.

2.2.6. Hypotheses for venture capital

To summarize the academic literature that was reviewed and outlined above suggests a positive effect of venture capital investors' syndication on investee companies' performance. Therefore, there should be sufficient evidence in support of the following hypotheses for the purposes of this thesis.

H6: Successful venture capital backed companies are more likely to be backed by an investors' syndicate than unsuccessful companies.

H7: Successful venture capital backed companies are more likely to have high-quality investors' syndicates involved than unsuccessful companies.

3. Methodology and data

During the course of the previous sections, various factors of human capital, venture capital financings and venture capital syndication were discussed and different focuses on the relationships among these subjects and with regard to the performance of the entrepreneurial venture outlined. A summary of these relationships is demonstrated in

the subsequent paragraphs to interpret the framework for analysis proposed for this thesis.

- Higher quality of the investors' syndicate has a positive effect on syndication in terms of its quantity and quality
- Venture capital syndication intensifies the effects of venture capital investments. Existing research confirms the intuitive assumption that several investors can achieve more than a single investor.
- Venture capital investments have a positive effect on the level on the human capital in a company. Within their *coach* function, venture capitalists complement founders' existing capabilities with additional management skills and industry experience.
- Human capital increases the probability of higher company performance. Statistically, management teams with higher levels of human capital are associated with better outcomes in terms of growth and operating performance.

Following this above series of logical relationships, the expectation of this thesis is to find empirical evidence that venture capital syndication is associated with superior investee companies' performance as a result of the addition of further quality human capital. Therefore, the findings of this thesis directly respond to the rising discussions on the effects of syndication on investee companies' success. They also contribute to the continuing discussion about the *scouting* versus *coaching* function of venture capitalists by analysing these effects for factors of human capital.

3.1. Venture capital industry data overview

When evaluating the various dimensions of European venture capital, it is important to consider the industry in a larger context of the private equity industry in Europe.

Table 1: European Private Equity – Total Investments and Fund Allocation 2002-2006

EUR billion	2002	2003	2004	2005
Venture high-tech	4,2	2,3	2,5	5,1
Venture non high-tech	4,3	3,4	6,3	5,8
Total venture	8,5	5,7	8,8	10,9
Buyout	18,3	21	17,8	57,7
Not Available	0,7	0,3	0,9	3,2
Total Funds Raised	27,5	27	27,5	71,8

Source: EVCA, Thomson Financial, PriceWaterhouse Coopers

When presenting the key indicators of the European private equity fundraising and investments for the time period examined in this thesis, Table 1 and Figure 1 show that there is a dominance of buy-out deals. On the contrary, Venture Capital has played a minor role in terms of funds raised and funds invested, mainly because the deals are smaller when compared to larger Buy-out deals.

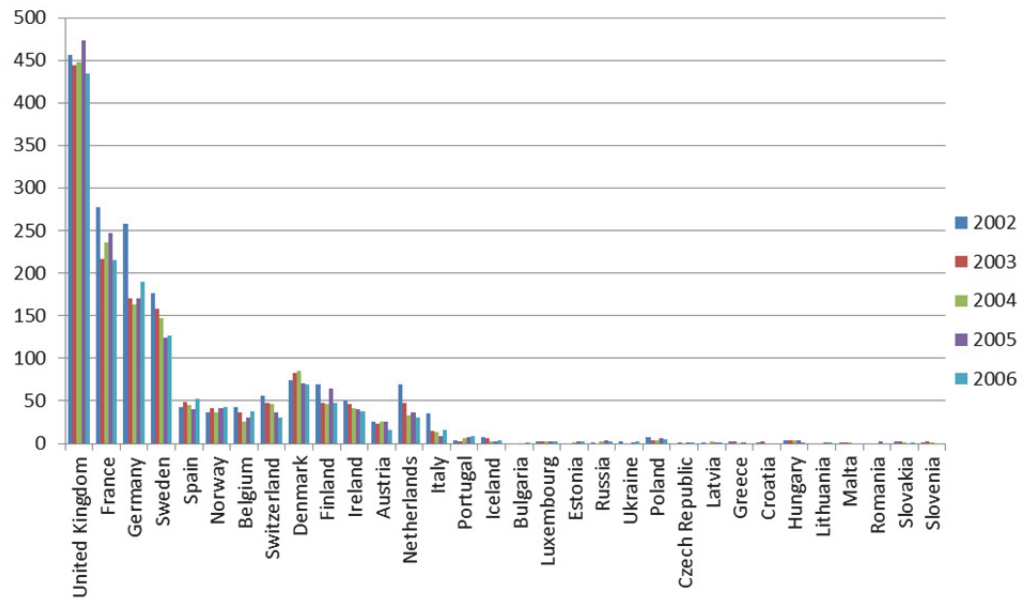
Figure 1: European Private Equity Activity by Amount and its development over time



Source: EVCA, Thomson Financial, PriceWaterhouse Coopers

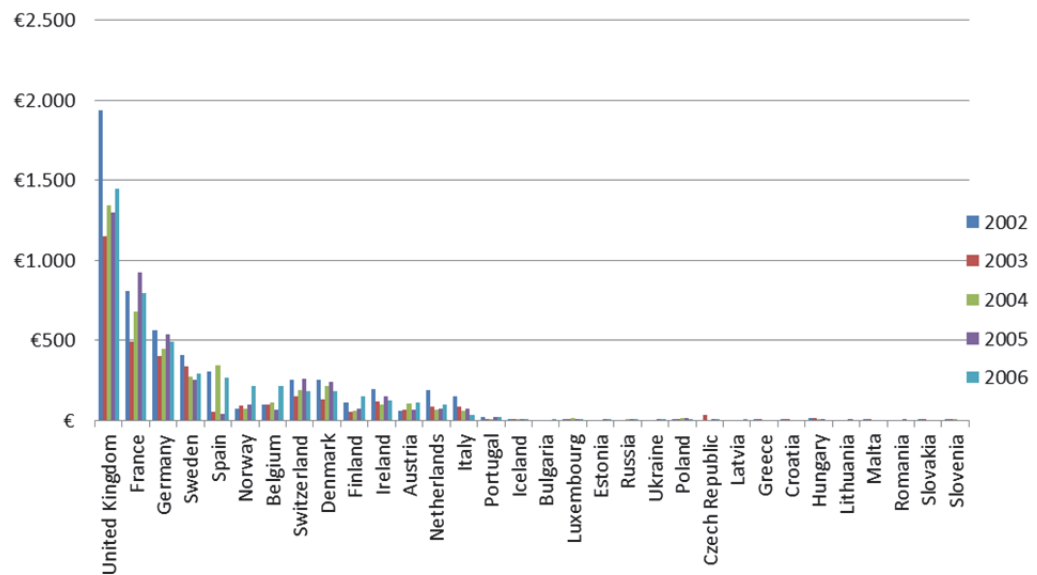
These statistics shall be examined in the economic context of that time, especially because the low cost of debt financing during 2006 raised the effectiveness, profitability and attractiveness of buy-out transactions.

Figure 2: Country Comparison - Number of Companies Funded



Source: DowJones VentureSource

Figure 3: Country Comparison – Value of Investments



Source: DowJones VentureSource

For the last one or two decades, the European venture capital industry has been prominent and mostly concentrated in a few countries only. Figures 2 and Figure 3 give an overview of this fact and show the most important and active countries of European venture capital between 2002 and 2006 (the relevant time frame of the analysis in this thesis). Throughout these countries, the average investment size for an investment round was quite stable during this five-year period. It ranged somewhere between EUR 2.2 million per round in 2003 to of €3.2 million per round in 2006, which were the maxima in the respected years.

3.2. Selection of the companies' samples for analyses

3.2.1. Sample of successful venture capital backed companies

For the this sample companies were selected based on two main factors considered by venture capitalists when evaluating the successfulness of an investee company's exit, the exit multiple and internal rate of return (IRR).

For a company to be considered a successful company and make the successful sample, it needed to fulfil the following criteria:

- The exit multiple needed to be at least five times of the invested capital or more, additionally
- The IRR needed to be at least 30% p.a. or more

Most of the companies were identified based on documents published by the European Venture Capital Association (EVCA). The prevailing majority of the companies were selected from "European Venture – A High Potential Industry", a 2009 EVCA presentation, which identifies a set of 50+ highly successful European venture capital investments.

Further companies were selected from “The European Venture Capital Market: Scaling Beyond Current Boundaries”, an EVCA Special Paper published in October 2007, which presents seven case studies of successful European venture capital investments, including detailed information on the investment timing and volume, the point of exit and the returns (IRR and investment multiple). The majority of these portfolio companies were exited in the years 2002 till 2006.

3.2.2. Sample of unsuccessful venture capital backed companies

The companies selected for the sample of unsuccessful venture capital investments are based on comprehensive data gathered in Dow Jones VentureSource, one of the most comprehensive database of venture capital and buy-out transactions, tracking investment volumes, valuations and investors by investment round, to name a few.

First, a desktop research was used to search the database for early-stage investments, i.e. seed and first-rounds, concluded in Europe between Jan 1st 2002 and Dec31st 2006, which went out of business or were currently undergoing bankruptcy procedures. This search produced a set of more than 350 companies. Second, this first set was narrowed down to 39 companies by applying further filters. A minimum total capital raised to date of the last financing round of EUR 5 million was applied, seed rounds were excluded from the financing rounds and the stage of development of the investee companies were narrowed down to “shipping product” and “profitable only” according to DowJones VentureSource methodology. These restrictions were introduced in order to focus on investee companies which received substantial commitments from venture capitalists (see investment size), already achieved the point of “proof of concept” (see development of the company) however eventually failed anyway.

With regards to geography, all companies in both the samples were chosen to be based or originated in the European Union countries plus other non-member European countries that , e.g. Switzerland, Norway, etc.. Therefore, it can be expected that the economic environment in which the companies that were evaluated in this thesis are conducting business is satisfactorily similar conditions and the impact of major economic factors (i.e. GDP growth, inflation rate, etc.) can be neglected in the analysis.

3.3. Data validation

To verify the success of the selected companies and the returns realised by the venture capitalists on their investments, additional data was extracted from specialised databases, such as DowJones VentureSource and Amadeus, as well as press releases, predominantly accessed via DowJones Factiva.

3.3.1. Venture capital syndication data validation

As mentioned above, Dow Jones VentureSource offers comprehensive information on private companies that have received venture capital financing. It encompasses office location, date of foundation, number of employees, description of the business activity, company's team and board members information. More than that, this database offers detailed information on the financing rounds of these companies with comprehensive information on the number and timing of any financing rounds, the volume and company valuation, the number and name of all investors and the respective rounds in which they participated, the company's stage of development at each round as well as the total amount raised in each financing event and the kind of the investment round (i.e. equity raising, debt issuing or bridge financing).

The DowJones VentureSource data is primarily based on information sourced directly sourced from investment managers of venture capital management companies and complemented by information sourced from the investee companies and DowJones research. This entails the risk that the amount and detail of the information provided can slightly vary from investee company to investee company. Therefore, beyond the data explained above, for some investee companies the information on the post-money as well as the exit valuation (i.e. the price paid by the acquiring buyer or company valuation underlying an initial public offering) was made available.

3.3.2. Human capital data validation

Implementing the four key metrics of human capital most frequently cited, examined and used in academic literature, human capital data sourcing was focused on the following management board member attributes.

- Educational (highest level of education achieved and degree faculty)
- Entrepreneurial experience (prior experience in an early-stage company)
- Industry experience (in terms of professional experience)
- Management experience (defined as previously holding C-level or VP/Director-level management position)

DowJones VentureSource was used to gather information on the composition and names of the management boards of the companies comprising both samples. For almost all of the investee companies included in the two samples, DowJones VentureSource enabled to gather the composition of the board with the names of the members and their respective responsibilities (i.e. Chief Executive Officer, Chief Financial Officer, etc.).

For most of the companies, DowJones VentureSource data provided the name of the board members, their respective roles (e.g. CEO, CFO, Institutional Investor, Outsider) and a short overview of a board member's former professional experience (most of the time including details on the role, the function and the name of the company).

The depth of information available for each company varied. While some companies showed management structure and responsibilities to the Director level, others had information available only on the top three company executives (i.e. CEO, CFO and COO). For most companies, however, consistent information down to the Vice-President level was available.

With the goal to complement this partly missing data and to provide a more comprehensive view on the human capital on the boards of the sample investee companies, additional information was gathered through online professional networks, such as LinkedIn, Xing or Spoke, as well as from the Bloomberg Businessweek online section on Companies. In addition to that specific data fragments were gathered through individual research online.

The data research produced a sizable pool of data with information asymmetrically allocated across the unsuccessful investee companies' sample. For that reason, the data collected was reviewed with regards to relevance and consistency. For the purpose of the analysis, board members with management responsibilities were considered relevant only. Thus, board members labelled as Chairman, Institutional Investors, Individual Investors, Consultants or Outsiders according to DowJones VentureSource were excluded, as they are not directly involved in the company's day-to-day operations, and thus not deemed to have a direct effect on company performance.

In addition to the above, board members were reviewed with regards to their level of responsibility in the investee company. With the purpose of

controlling for discrepancies in the number of managing board members listed in DowJones VentureSource, a further distinction was made to focus on the two most senior levels of management: C-level (i.e. CEO, CFO, COO, etc.) and Vice President (VP) level. Nevertheless, these limitations were adjusted to the data available for each investee company:

- When no VP-level positions were listed whatsoever, it was assumed that the second reporting level was assumed by Directors or Managing Directors (depending on the position titles used in the company).
- Overall attention was put on filling all management functions (i.e. operations, marketing, finance, etc.). Therefore, where no C-level or VP-level position was mentioned for one specific function, a lower reporting levels were included to complement the management team, e.g. where no CFO or VP Marketing position was mentioned, the Director of Finance was named. However, where a VP of Finance was named, Directors of Finance were not included in the analysis.

3.3.3. Data validation for the Sample of successful venture capital backed companies

For the purpose of calculating exit returns, DowJones VentureSource data was supplemented with data from the Amadeus database “which contains comprehensive information on around 19 million companies across Europe” and can be used “to research individual companies, search for companies with specific profiles and for analysis” (www.bvdinfo.com). If the data found in DowJones and Amadeus was not satisfactory, a desktop search online in DowJones Factiva was conducted to retrieve further indication and proof of exit multiples and IRRs from trustworthy business press sources. The following process was used to determine investment returns.

- Exit multiples were based on specific information cited in trustworthy press releases or calculated based on investment data provided in DowJones VentureSource. When calculated, the calculations were based on venture capitalists' shareholdings in the investee company on a cumulative level based on the amount invested and the company valuation underlying any given investment round, from which the shareholding and dilution of previous investors can be extracted.
- Due to the fact that most of the detailed information on the relationships between the investors is kept confidential and not being published, when considering IPO returns, various simplifying assumptions were made. For the purpose of averting contractual and transactional complexities among investors (e.g. rank among each other in terms of liquidation preference, its height and pay-out and timing and volume of shares sold etc.), holding value of the investors' shareholdings at the time and valuation of the IPO was used to calculate the return multiple on the venture capitalists' investment. This was based on the assumption that existing shareholders/investors could have sold all their shareholdings in the course of the IPO at the initial price per share or shortly afterwards. Thus, an average return across venture capital investors was calculated. The aggregate venture capitalists' shareholdings held before exit were adjusted for the dilution caused by the IPO and the entry of new shareholders, the buyers of the IPO stock.
- In order to take the differences in the currency in which investment information was provided into account (DowJones VentureSource data and business press was stated in either Euros or Dollars), an effort was made to display all financing information in one currency, the Euro. Foreign exchange rate for any given period was extracted using the services of

<http://www.xe.com> which provides historical foreign exchange rates from the year 1995 for a wide variety of currencies.

- Furthermore, only equity stakes and thus financings using equity or equity-like instruments were taken into account. Information labelled debt or bridge financing was not considered. Similarly, financings by individual investors or governments funds were not included in the analyses.

This validation process enabled the identification of those companies that qualified for the sample of successful venture capital backed companies: out of the original set of 58 companies, 22 investments yielded returns equal or above five times the investment volume with an IRR of 30% p.a. or more. Screening of the rest of the companies led to identifying returns below the selection criteria or, as a result of insufficient data, didn't enable a definitive and reliable result regarding the return of these venture capital investments. One company was excluded from the sample even though an IRR of above 30% p.a. could be achieved. Nevertheless, this investee company only returned 2.5 times the invested capital to the investors, therefore it didn't fulfil the exit multiple required in the selection criteria.

With regards to data on human capital, information for the successful investee companies sample was fairly comprehensive.

3.3.4. Data validation for the Sample of unsuccessful venture capital backed companies

The validation process for the unsuccessful sample of venture capital backed companies was comparable with the successful companies' sample. 39 companies were identified during the selection process. Due to insufficient data on syndication, three firms needed to be excluded. Thus, 36 companies remained in the sample after validation of the syndication data.

Additionally, further ten companies needed to be excluded from the sample after comprehensive human capital data screening and validation for to the following reasons:

- Board members could not be identified (one company),
- DowJones VentureSource provided board member names only. In spite of additional research, no further information could be found (four companies),
- The volume of information available after research was thought of as insufficient to produce a significant result (five companies)

Thus the final size of the sample of unsuccessful venture capital backed companies was 26.

4. Description of variables used for analysis

During the collection and review of the data the following data sets were created and respective variables used for human capital:

- Human capital of successful companies,
- Human capital of unsuccessful companies

For both of these data sets the following variables were collected:

- Education level (basic and advanced)
- Education relevance
- Professional experience relevance
- Previous start-up/entrepreneurial experience
- Previous senior management experience

For the venture capital part the following data sets were created:

- Venture capital investment and syndication of successful companies and
- Venture capital investment and syndication of unsuccessful companies

For these data sets the following variables were collected:

- Indicator for syndication
- Number of venture capitalists invested
- Number of venture capitalists invested according to financing rounds (data for each investment round, i.e. 1, 2, 3, etc. until exit occurred, either trade sale/IPO or write-off)
- Quality of an investor

Not all of these variables were quantitative. In order to be able to compare and analyse these non-quantitative variables, qualitative data was converted into numeric values with the help of dummy variables.

The following variables were chosen as dummy variables:

- Education level (indicating basic or advanced education)
- Education relevance (indicating relevance or irrelevance)
- Professional experience relevance (indicating relevance or irrelevance)
- Indicator for syndication (showing if there was any syndication in any of the financing rounds)
- Indicator for success (showing which sample the company belongs to, i.e. sample of successful venture capital backed companies or sample of unsuccessful venture capital backed companies)

The following paragraphs outline the procedure and methodology that was applied in transforming qualitative information into dummy variables.

4.1. Education level

To describe the level of education of the board members two main variables were introduced: advanced level of education and basic level of education. Advanced level was used to describe postgraduate

degrees, such as PhDs, other doctoral qualifications and MBAs. The definition of basic level included three or four-year undergraduate degrees, e.g. bachelor's and master's degrees. Either of the two variables symbolises the highest qualification achieved. The board members were only assigned to one of the two categories, as a consequence. In cases where the only available information on education was the institution where the education was gathered, the basic level of education was chosen.

4.2. Education relevance

For education that was related to the broader field of a company's activity, one point was awarded and zero points for education that was considered irrelevant. General education, e.g. management, law, finance or mathematics, was usually not considered relevant in cases where this kind of education was used in a functional context only, such as in the role of a Chief Finance Officer.

Only in cases where the education was essential for the operational activity of a company, e.g. for companies in the financial services or financial information services industries was this kind of education considered relevant. The underlying assumption to this approach is the belief that industry relevant knowledge is valued higher by a company than knowledge related to a function that is comparably similar across industries.

Even though Table 2 does not provide a complete overview of all industries and relevant and related educations, it gives an indication as to the type of education considered relevant for the particular industries. This information was collected from researching the profiles of the management teams observed. Hence, Table 2 is not an exhaustive display of all educational backgrounds which may theoretically be appropriate to the respective industry; however it summarises and gives an overview of the management team profiles actually reviewed and

considered relevant for the analysis. Therefore, some industries, e.g. internet, are linked with a limited number of relevant educational backgrounds only. The reason being that the profiles reviewed were largely homogenous in this industry. In addition, in some categories, e.g. agriculture, medical devices or transport, the number of companies analysed was quite low, resulting in a relatively small number of relevant education backgrounds.

Table 2: Education relevance

Company industry	Focus of education
Agriculture	Plant Genetics
Biotechnology	Biotechnology Microbiology Chemical Engineering Medicine
Electronics	Computer Science Electronics Engineering Physics
Energy	Chemical Engineering Geology Geophysics Physics Theoretical Seismology
Financial Services	Business Administration Economics MBA
Information Technology	Computer Science
Pharmaceuticals & Healthcare	Biochemistry Biology Chemical Engineering Genetics Immunology Medicine Physical Chemistry
Semiconductors	Electrical Engineering Industrial Engineering Electronics Physics
Software	Computer Science Information Systems Physics Software Engineering
Telecommunications & Networking	Electrical Engineering Engineering Physics Telecommunications
Transportation	Aerospace Engineering

Source: Data collected

4.3. Professional experience relevance

In order to analyse the relevance of previous professional experience, one point was awarded to management teams that previously held positions in the same industry as the company analysed and zero for positions held in unrelated industries. The categorisation of the industries was based on the structure and terminology used by LinkedIn.com, the largest online network of professionals. In order to produce an individual's relevance score the points for each position held were summed up for the respective board member.

On the contrary, the following variables were extracted as numerical data where no transformation into dummy variables was necessary:

- Previous start-up/entrepreneurial experience: the number of start-up companies previously started was recorded
- Previous senior management (SMT) experience: number of SMT positions previously held was recorded
- Number of venture capitalists invested: the average number of venture capitalists for a given investee company across all financing rounds was recorded
- Number of venture capitalists invested in a given investment round: the average number of venture capitalists for a given company and a given financing round was recorded

4.4. Quality of an investor

For the purpose of evaluating the value of venture capital investors with regards to their quality in a venture capitalists' syndicate, i.e. their syndication capabilities, and to analyse the quality of collaboration among the co-investing venture capitalists, a 2-point system was used to categorise the different outcomes of syndication agreements. Quality was measured following a financing round (therefore, the investment

round 2 is the first possible observation) by the round-to-round development of the investors' syndicate base.

Following this logic, zero points were allocated to investors which did not produce syndication in the following round (this means one or more investors decided not to participate in further investment rounds and/or additional co-investment partners could not be attracted). One point was given to investors which showed continuing support and commitment to the investee company, which means that either the existing syndication partnership was extended (i.e. at least two investors of the previous investment round decided to continue co-investing in the next financing round) or the investors were successful in attracting additional syndicate partners. Two points were awarded to investors' syndicates which managed to do both, i.e. follow-on syndication by existing syndicate investors and attraction of additional investors.

For variables used in the human capital part (i.e. education level, education relevance, professional experience relevance, previous entrepreneurial experience, previous SMT experience), information was first gathered and input for each board member individually. The individual board member scores were then accumulated on the company level to produce a company score. These company scores were then used to calculate an average to account for various numbers of observations. The number of observations can differ for the following reasons: there was more information per board member was available publicly or the information on and number of board members listed in DowJones VentureSource was larger, since venture capitalists or the company itself provided more detail on the composition of the board or there was a higher rotation of board members. In fact, the two companies' samples differ considerably with respect to the number of observations taken per company when considering the human capital metrics. The sample of unsuccessful venture capital backed companies has a much higher maximum and minimum mean and median values of

observations than sample of successful venture capital backed companies, which could have significantly affected the results. Consequently, the results per observation are assumed to be a more trusting measure. On the contrary, variables related to investors' syndication (i.e. indicator for syndication, number of venture capitalists invested, number of venture capitalists invested according to financing rounds, quality of an investor) were collected on the company level from the beginning, therefore did not needed to be calculated on an aggregated or average basis.

5. Description of the companies' samples

The following tables 3 – 11 give a brief summary of the most important attributes of both the Samples of successful unsuccessful venture capital backed companies. After a comparison of the aforementioned samples, it was possible to show that the 22 successful and 26 unsuccessful investee companies examined differ from each other in numerous characteristics. The most notable differences are summarized below.

5.1. Industry distribution of sample companies

Within the sample of successful venture capital backed companies, the industries with highest representation were information technology (32 %), energy (23 %), and with pharmaceuticals & healthcare and telecommunications & networking sharing the third place (9 %) as can be seen in Table 3. On the contrary, the highest ranks in the sample of unsuccessful venture capital backed companies took the software (50% of unsuccessful companies), semiconductors (15%) and electronics (12%) industries. These results need to be seen within a larger context where investors put higher emphasis the commercialisation of the technologies in the alternative energy sector, ever increasing competitive pressure in the semiconductor industry and the evolution

from software-based to online application-based business models during the period evaluated.

Table 3: Investee companies – Distribution by Industry

	Both Samples		Successful		Unsuccessful	
		% of Total		% of Total		% of Total
Agriculture	1	2,1	0	0,0	1	3,8
Biotechnology	4	8,3	2	9,1	2	7,7
Electronics	3	6,3	0	0,0	3	11,5
Energy	5	10,4	5	22,7	0	0,0
Financial Services	2	4,2	2	9,1	0	0,0
Information Technology	7	14,6	7	31,8	0	0,0
Pharmaceuticals & Healthcare	2	4,2	2	9,1	0	0,0
Retail	2	4,2	0	0,0	2	7,7
Semiconductors	4	8,3	0	0,0	4	15,4
Software	14	29,2	1	4,5	13	50,0
Transport	1	2,1	1	4,5	0	0,0
Telecommunications and Networking	3	6,3	2	9,1	1	3,8
Total	48	100,0	22	100,0	26	100,0

Source: Data collected

When comparing these results to the overall sample, i.e. including successful and unsuccessful companies, the software industry leads with respect to the number of venture capital investments. On the other hand, semiconductors and electronics don't play a significant role in the overall sample. Likewise, considering the two samples, it stands out that Energy plays a significant role in the overall sample but no role at all in the unsuccessful sample. In general, these sample statistics and data should be interpreted with carefulness since there is a possibility of various classifications having been applied.

5.2. Country distribution of sample companies

When looking at the geographical distribution of the companies within the respective samples in Table 4, the two most frequently represented countries are United Kingdom and Germany which is correspondent to Figure 2 and Figure 3 above where these countries rank among the top active European countries in terms of Venture Capital Investments. It is the relationship of the two countries that immediately catches one's eye.

Germany accounts for 41% and United Kingdom for 23% of the successful investments. In the unsuccessful sample this ratio turns around. Germany accounts for 19% and United Kingdom for 39% of the unsuccessful investments. It could thus be argued that the venture capital backed companies in Germany are more often successful and United Kingdom start-ups more often unsuccessful. Nevertheless, jumping to such a conclusion may be premature given the samples only take the most extreme outcomes of venture capital investing into account, i.e. highly successful or complete failures. Therefore, the examined country representations may be considerably different once the sample is extended in the number of company observations.

Table 4: Investee companies – Distribution by Country

	Both Samples	% of Total	Successful	% of Total	Unsuccessful	% of Total
Austria	2	4,2	0	0,0	2	7,7
Belgium	1	2,1	0	0,0	1	3,8
Switzerland	3	6,3	1	4,5	2	7,7
Germany	14	29,2	9	40,9	5	19,2
Denmark	1	2,1	0	0,0	1	3,8
Spain	3	6,3	1	4,5	2	7,7
France	4	8,3	2	9,1	2	7,7
Italy	1	2,1	1	4,5	0	0,0
Norway	3	6,3	3	13,6	0	0,0
Sweden	1	2,1	0	0,0	1	3,8
United Kingdom	15	31,3	5	22,7	10	38,5
Total	48	100,0	22	100,0	26	100,0

Source: Data collected

When comparing the overall sample, i.e. successful and unsuccessful together, with the respective samples' country distribution, again United Kingdom and Germany dominate, with 31% and 29% respectively. However, when considering Figure 2 and Figure 3 above, one could say that the Scandinavian countries are underrepresented in the samples.

5.3. Human capital data

The senior management team data described in Table 5 and Table 6 give a detailed overview of the data collected for the five factors that feed into human capital: education level, education relevance, previous professional experience, previous start-up/ entrepreneurial experience and previous senior management team experience, especially the completion rate of the data is shown. Overall, data sourced for the sample of unsuccessful venture capital backed companies is somewhat more comprehensive than for the successful sample. Also, it was observed that the sample of unsuccessful companies is larger than the sample successful companies in terms of the overall number of management board members reviewed, 187 for unsuccessful and 115 for successful companies.

Table 5: Management board data distribution – sample of unsuccessful venture capital backed companies

26 companies 187 management board members evaluated	overall			company level		
	data complete	data partly complete	data none	data complete	data partly complete	data none
Management board profiles reviewed	127	57	3	4	18	0
% of total	68%	30%	2%	15%	69%	0%

Source: Data collected

Table 6: Management board data distribution – sample of successful venture capital backed companies

22 companies 115 management board profiles evaluated	overall			company level		
	data complete	data partly complete	data none	data complete	data partly complete	data none
Management board profiles reviewed	66	49	0	4	18	0
% of total	57%	43%	0%	18%	82%	0%

Source: Data collected

The result is counterintuitive and contrary to the current academic literature which suggests that higher human capital has a positive influence on a venture's success.

Various explanations of these results are possible. One could argue that the involvement of venture capitalists in investee companies has no substantial impact on the companies' performance. Instead, other company-inherent dynamics are the main factors influencing a success or failure of a company. Alternatively, it could be argued that the venture capitalists' syndicates are such heterogeneous that depending on the different characteristics of the syndicate and/or single persons in those syndicates, some of them will bring higher value added for their investee companies than others. The first argument would favour the scouting view on venture capitalists, the second the coaching view, alternatively.

5.4. Investment and syndication data

The data collected in connection with venture capital investments, numerous characteristics are obvious. It can be noted in Table 7 and Table 8 below that across all financing rounds, successful and unsuccessful companies received similar volumes of venture capital, on average. A notable distinction is the median investment size which is significantly higher in the sample of unsuccessful companies. This may support the statement that venture capital practitioners often repeat, i.e. extensive volumes of initial funding is rather counterproductive since it doesn't force early-stage companies to focus but rather they spread their focus across a broader spectrum activities which can affect the likelihood of a company to succeed. Another notable difference that after Round 2 where investment volumes are similar with regards to median investment size, the picture turns around. The investment volume in the sample of successful samples increases, supporting growth and a path to success. On the other hand, the median investment size in the sample of unsuccessful companies decreases

supporting a common strategy used by venture capitalists when the development of a venture lags behind plan, drip feed (www.investopedia.com) postponing the failure of a venture in the hopes of the situation turning around.

Table 7: Investment data overview – sample of successful venture capital backed companies

N	Investment volume EURm						Exit Multiple
	Round 1	Round 2	Round 3	Round 4	Round 5	Total	
# of companies	17	14	4	1	1	20	22
Mean	6,2	7,1	7,2	6,4	5,9	12,3	15,2
Median	3,6	4,9	5,9	6,4	5,9	10,2	8,3
Min	,8	1,0	1,8	6,4	5,9	,8	5,0
Max	30,0	24,1	15,2	6,4	5,9	42,2	101,6
Sum	105,3	99,5	28,7	6,4	5,9	245,7	
25 percentile	1,5	2,6	2,6	6,4	5,9	3,7	6,3
50 percentile	3,6	4,9	5,9	6,4	5,9	10,2	8,3
75 percentile	10,3	10,4	13,0	6,4	5,9	13,9	15,1
100 percentile	30,0	24,1	15,2	6,4	5,9	42,2	101,6

Source: Data collected

Table 8: Investment data overview – sample of unsuccessful venture capital backed companies

N	Investment volume EURm						Total
	Round 1	Round 2	Round 3	Round 4	Round 5		
# of companies	23	19	6	3	0		26
Mean	5,8	7,4	7,2	7,9	0		13,1
Median	5,0	5,0	3,6	3,2	0		8,4
Min	,2	,4	2,2	2,9	0		3,2
Max	16,8	29,8	25,0	17,4	0		57,1
Sum	132,8	140,6	43,4	23,6	0		
25 percentile	3,5	2,2	2,4	2,9	0		5,0
50 percentile	5,0	5,0	3,6	3,2	0		8,4
75 percentile	8,5	9,0	11,1	.	0		14,5
100 percentile	16,8	29,8	25,0	17,4	0		57,1

Source: Data collected

When considered jointly, the majority of the investment rounds observed was syndicated along the way towards exit, be it a successful or unsuccessful one. Table 9 shows the occurrence of syndication across the two samples and the overall sample. For the purposes of this calculation; syndication is measured as at least one investors' syndicate

occurring within any investment round of a respective investee company. When examining the syndication data for the samples, it is obvious that both in absolute and relative terms investors' syndication prevails in the sample of unsuccessful companies.

Table 9: Investment data overview – occurrence of syndication across the samples

Syndication occurrence	successful #	% of total	unsuccessful #	% of total	Both samples #	% of total
yes	14	64%	20	77%	34	71%
no	8	36%	6	23%	14	29%
Total	22	100%	26	100%	48	100%

Source: Data collected

A closer look at the syndication rates in Table 10 and Table 11 in the respective investment round show that syndication, measured as percentage of syndicated versus all investment rounds, the rate in the sample of successful companies rose until investment round 3 which is consistent with the observation of the median amount invested per investment round mentioned above. This suggests that investors' syndicates in the successful sample of companies placed smaller bets in the earlier rounds and extended the investment volumes further only after observing progress with these companies. In order to commit the higher investment volumes, additional syndicate partners were invited to participate in the investment round.

On the other hand, examining the sample of unsuccessful companies the syndication rate remains approximately the same which could be a sign of drip feeding the companies as mentioned above until finally a failure occurred and investors refrained from further financing of the company.

The median number of venture capitalists participating in an investment round as shown in Table 10 and Table 11 support the view that the companies in the successful sample were initially identified and financed by a single investor who attracted syndication partners only in

follow-on investment rounds. On the contrary, the companies in the unsuccessful sample had investors' syndicates from the very beginning of their funding history

Table 10: Syndication data overview – sample of successful venture capital backed companies

Number of venture capitalists participating in an investment round						
	R1	R2	R3	R4	R5	All
# of companies	22	15	4	1	1	22
Mean	1,6	2,9	5,5	1,0	9,0	3,0
Median	1,0	2,0	5,5	1,0	9,0	2,0
Sum	36,0	44,0	22,0	1,0	9,0	64,0

Syndication overview						
	R1	R2	R3	R4	R5	All
# of syndicated rounds	8	10	4	0	1	23
# of non-syndicated rounds	14	5	0	1	0	20
# of syndicated rounds as a % of total rounds	36,4%	66,7%	100,0%	0,0%	100,0%	53,5%

Source: Data collected

Table 11: Syndication data overview – sample of unsuccessful venture capital backed companies

Number of venture capitalists participating in an investment round						
	R1	R2	R3	R4	R5	All
# of companies	26	20	7	4	1	26
Mean	1,6	2,0	3,0	3,0	1,0	3,0
Median	2,0	2,0	2,0	3,0	1,0	2,0
Sum	48,0	44,0	21,0	13,0	1,0	68,0

Syndication overview						
	R1	R2	R3	R4	R5	All
# of syndicated rounds	14	13	4	2	0	33
# of non-syndicated rounds	12	7	3	2	1	25
# of syndicated rounds as a % of total rounds	53,8%	65,0%	57,1%	50,0%	0,0%	56,9%

Source: Data collected

6. Data analysis

To examine if the hypotheses stated above hold true, SPSS software was used to analyse the data described above.

For the analysis of human capital additional calculations in SPSS were necessary. In order to calculate a human capital score for each individual board member evaluated, the following sub-scales were summarised into one single indicator “human capital: education level, education relevance, professional experience relevance, previous senior management experience and previous start-up/entrepreneurial experience. A low value of this indicator represents a low level of human capital.

To analyse the two samples according to the human capital and venture capital hypotheses it was intended to perform a student T-test with a significance level of $\alpha = 0,05$. This test is usually applied when the means of two samples need to be compared. In a first step, the following prerequisites for such a test were examined:

- Independent samples
- Metric variables
- Gaussian distribution in both samples
- Homogeneous variances

However, the student t-test could not be performed for neither of the hypotheses. The independent samples were given but metric variables were not present at all times. Additionally, no Gaussian distribution could be found in the data. This was tested with the help of a Kolmogorov-Smirnov test. Thus, the variances were not tested given that the Gaussian distribution wasn't present in the samples.

In order to be able to compare the two samples, a non-parametric statistical test was performed as an alternative to the student t-test, the

Mann-Whitney U test. From the start, a significance level α of 0,05 was chosen as the maximum probability of error for testing the hypotheses.

7. Results

As described above, all hypotheses were established based on the literature reviewed and are all directional hypotheses. Hereinafter, the individual hypotheses are being examined.

H1 – Successful early-stage companies have higher levels of human capital compared to unsuccessful early-stage companies

A significant result could be found with $p < 0,05$. Thus, the alternative hypothesis can be confirmed. However, when taking a closer look at the mean ranks of the respective samples, an opposite direction than the one hypothesised in H1 was observed. Therefore, a higher level of human capital is manifested in the sample of unsuccessful venture capital backed companies than in the successful ones.

H2 – Successful early-stage companies have higher levels of education compared to unsuccessful early-stage companies, on an average basis

The H0 hypothesis can be rejected, since a significance level with $p < 0,05$ could be found. Thus, the assumption that successful venture capital backed companies have a higher level of education compared to unsuccessful venture capital backed companies can be supported because the successful companies have higher mean ranks.

H3 – Successful early-stage companies have higher levels of prior entrepreneurial experience compared to unsuccessful early-stage companies, on an average basis

A significant result with $p < 0,05$ could be found. Thus, the alternative hypothesis can be confirmed. The direction is consequent with the

mean ranks, thus, it could be confirmed that successful venture capital companies have a higher level of previous start-up experience than unsuccessful companies.

H4 – Successful early-stage companies have higher levels of industry experience compared to unsuccessful early-stage companies, on an average basis

The alternative hypothesis can be confirmed since a significant result with $p < 0,05$ could be found. However, the examined board members of unsuccessful venture capital backed companies altogether showed more previous industry than the ones in the successful sample of companies. This is contradictory to the hypothesised direction of H4.

H5 – Successful early-stage companies have higher levels of management experience compared to unsuccessful early-stage companies, on an average basis

The H0 hypothesis could be confirmed because of $p > 0,05$ (with $p = 0,0775$). This result shows no significant difference between the two samples with respect to previous senior management team experience of the board members examined.

H6: Successful venture capital backed companies are more likely to be backed by an investors' syndicate than unsuccessful companies.

The H0 hypothesis could be confirmed since $p > 0,05$. Thus, there is no significant difference between the two samples.

H7: Successful venture capital backed companies are more likely to have high-quality investors' syndicates involved than unsuccessful companies.

The H0 hypothesis could be confirmed with $p > 0,05$. Thus, no significant difference between the two samples with respect to the quality of a venture capital investors' syndicate could be confirmed.

8. Discussion of results

Contrary to the existing literature examined in this thesis, the analysis found little evidence in the compared two samples that higher levels of human capital are related to higher investee companies' performance. Merely a higher level of education and previous start-up/entrepreneurial experience showed a statistically significant influence on the success of a venture capital backed company

A possible explanation for these rather surprising results may be that the data exploration and the analysis did not account for fluctuation, timing of recruitment and dismissal of the board members examined. Thus, in times of turmoil in the case of the unsuccessful companies, venture capitalist might have executed team changes and additions more frequently than in the case of successful ventures. However, given a life cycle of a company and the ever changing competitive environment surrounding innovative early-stage companies, even board members with higher human capital levels that were added to the senior management team later on might have had not enough impact on successfully turning the venture's faith around. The analysis in this thesis did not account for this possibility.

Another reason could be that the variables used were not defined precisely enough. Additionally, the fact that documents from online sources such as LinkedIn, Xing, Spoke, Businessweek, Bloomberg, websites, resumes, and press releases were used to gather the data for the management board members and translate them into a statistical concept may have contributed to the mixed evidence and an inaccurate analysis. Parts of the data were coded in dichotomous variables and one polytomous variable, i.e. the analysis might have been exposed to

the risk of inaccurate interpretation and transformation of qualitative data.

Summarising results for the human capital data, previous professional experience, i.e. industry experience, not having a significant effect on the success of a venture might be the most surprising outcome of the analysis. However, as already mentioned above, due to various structural reasons the analysis might have not been accurate in this regard. This analysis could be extended to account for the shortcomings mentioned above, i.e. the fluctuation, timing of recruitment and dismissal, and perhaps also the years spent in a relevant previous role, to re-evaluate the influence of previous professional experience on the success of a venture during their engagement with the company.

With respect to venture capital syndication within the two companies' samples, numerous surprising results arose as well. Previous literature review connected syndication to superior investee companies' performance. Thus, the expectation was to find a higher syndication rate among the successful companies. However, no statistical significance could be found between the two samples. Additionally, the quality of the investors' syndicate was examined but yielded no significant difference between the samples. In general, based on the results of this analysis, no indication could be found that syndication had any effect on an investee company's performance. This may support an argument that other, company-inherent dynamics and perhaps the heterogeneity and different characteristics of the investors' syndicate and/or single persons in those syndicates, might be influential to the success of an early-stage company.

Based on the sample of successful companies collected for the purposes of this thesis, an interesting observation with regards to the syndication behaviour could be made. On average, the successful companies were funded by a single investor and used smaller volumes

of funding in the earlier rounds and only subsequently increased the number of syndicate partners and investment volume from round to round. This shows a high resource-consciousness and support the often stated fact by practitioners that focus as opposed to spreading oneself too thin is very important for the success of early-stage.

In retrospect, reflecting on the overall setup and the results of the analysis, the companies examined represented a very narrow selection of venture capital backed companies in Europe, both in terms of the sample of successful and unsuccessful companies that additionally were analysed from a very narrow point of view. Aside from the requirement of success or no success of the companies which drove the constitution of the two samples, other factors like industry specifics might have been omitted. The sample of unsuccessful companies contained companies from the semiconductor and biotechnology sector which face ever increasing competitive environment and pressure to succeed but also have inherent capital intensive business models. These factors may have contributed to a distorted picture in the analysis and thus further research into this field should account for much larger sample sizes and consider industry distribution.

Another factor that may have influenced the rather inconsistent results of this analysis is the relatively young age of the European venture capital industry with a limited amount of players with longstanding history and successful track record in venture capital investing contributing to a heterogeneous landscape of investors in this field.

9. Appendices

9.1. Zusammenfassung

Technologie-Start-ups, die “über Nacht” erfolgreich und in Multi-millionen Unternehmen gewachsen sind wie Skype, Google, Microsoft, Facebook oder Google haben vielfältiges Interesse an sich gezogen. Einerseits das von Regierungen als Quelle von Arbeitsstellen und Wirtschaftswachstum und das von Praktikern und Forschern, die Erfolgsfaktoren solcher Start-ups zu verstehen versuchen.

Venture Capital Investment ExpertInnen betrachten das Managementteam als eines der wichtigsten Entscheidungskriterien für Investitionen. Zusätzlich motivieren Venture Kapitalisten weitere Investoren mit zu investieren, nachdem sie die Wichtigkeit eines breiteren Netzwerks und zusätzlicher Ressourcen als Erfolgsvoraussetzung verstehen. Akademische Forschung hat diese Praktiken untersucht und einen positiven Zusammenhang zwischen dem Humankapitalniveau sowie syndizierten Investitionen und dem Unternehmenserfolg gezeigt. Basierend darauf wurde die Evaluierung von Europäischen Venture Capital finanzierten Frühphasenunternehmen zum Ziel dieser Diplomarbeit gemacht.

Um den Einfluss von Humankapital und Venture Capital Syndizierung zu untersuchen, wurden aus Europäischen Venture Capital finanzierten Frühphasenunternehmen zwei Sets ausgewählt. 22 außerordentlich erfolgreiche Unternehmen, wo Investoren beim Exit zumindest ein Vielfaches von 5 auf ihr eingesetztes Kapital und einen jährlichen internen Zinsfuß von mindestens 30% erwirtschaftet haben. Im Gegensatz dazu wurde ein Set von 26 nicht erfolgreichen Unternehmen ausgewählt, die signifikantes Investmentvolumen erhalten, ihre Produktentwicklung abgeschlossen und den Markteintritt bereits durchgeführt haben, jedoch trotzdem gescheitert sind.

Diese zwei Sets wurden analysiert und verglichen auf Basis von Ausbildungsniveau, Ausbildungsrelevanz, Berufserfahrungsrelevanz,

vorheriger Start-up/unternehmerischer Erfahrung und vorherigen Führungsrollen. Zusätzlich wurde Investorenqualität, Indikator für Syndizierung, Gesamtanzahl sowie Durchschnitt von Venture-Kapitalisten in einzelnen Investitionsrunden für Syndizierungsverhalten herangezogen.

Gegensätzlich zur bestehenden Literatur konnte kaum Evidenz für den Einfluss vom Gesamthumankapital gezeigt werden. Lediglich hohes Ausbildungsniveau und vorherige start-up/unternehmerische Erfahrung zeigte eine statistisch signifikante Beziehung zum Unternehmenserfolg. Die Investorenqualität hat keinen signifikanten Unterschied gezeigt. Für das Syndizierungsverhalten konnte zwar ein signifikanter Unterschied nachgewiesen werden, jedoch hatten die nicht erfolgreichen Unternehmen ein höheres Syndizierungsniveau, was der ursprünglich angenommenen Richtung widersprochen hat. Es gab jedoch andere interessante Beobachtungen. Erfolgreiche Unternehmen wurden von einem Investor mit einem kleineren Investmentvolumen in der ersten Finanzierungsrunde finanziert. Erst in Folgerunden wurde das Investmentvolumen erhöht und Syndizierungspartner eingeladen. Dies zeigt ein hohes Bewusstsein für Ressourcen und Fokus des Investors als Erfolgsvoraussetzung und unterstützt die Ansicht der Coachfunktion eines Investors, der ein erfolgreiches Unternehmen rundum ein qualitativ hochwertiges Team bilden kann. Die Scoutfunktion wird durch das Beitreten von Investoren in Folgerunden unterstützt.

Die Analyseergebnisse dieser Diplomarbeit sind von der engen Auswahl aus Europäischen Venture Capital finanzierten Unternehmen und deren Analyse anhand von eng gewählten Faktoren beeinflusst worden. Eine Erweiterung der Sets unter Berücksichtigung von industriespezifischen Faktoren wie kapitalintensive Businessmodelle und Entwicklungszeiten können in zukünftigen Untersuchungen zu aussagekräftigeren Ergebnissen führen. Die Reife und Größe der Europäischen Venture Capital Industrie sollte ebenfalls nicht außer Acht gelassen werden.

9.2. CV

MICHAL NESPOR

WORK EXPERIENCE

INiTS – Innovation goes Business, Vienna 05/2011 – present
Technology start-up incubator accompanying academic founders into business.
Start-up consultant – business angel and venture capital funding

Hired to implement an internal project with the aim to elevate VC investment knowledge at INiTS and improve success chances of the incubator teams to receive funding from private investors (Business Angels, VC, CVC, strategic investors etc.) as well as hands-on support of INiTS start-up teams during fundraising and negotiation with investors.

GCP gamma capital partners, Vienna 10/2005 – 03/2011
Leading Austrian Venture Capital Firm investing in DACH and CEE with €80m AUM.
Associate – New Media & TMT, Cleantech

EDUCATION

University of Vienna, Vienna, Austria 10/1999 – 09/2012
- Banking and Corporate Finance (English and German)

German Bilingual High School, Bratislava, Slovakia
09/1995 – 06/1999
- Final exam in English, German, Mathematics and Slovak
- Final state examination in German and Mathematics

LANGUAGES

Slovak: Mother Tongue
English: Reading, Writing and Verbal Skills: Excellent
German: Reading, Writing and Verbal Skills: Excellent
Czech: Reading, Writing and Verbal Skills: Excellent
Spanish: Reading, Writing and Verbal Skills: Basic

TECH SKILLS

Windows, MS Office, Mac OS

REFERENCES

Upon request

9.3. Sample DowJones VentureSource Profile

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GlycArt Biotechnology

www.glycart.com
Last Update: December 2010

[Company Profile](#)
[Comparable Companies](#)

CONTACT INFORMATION:

Wagistrasse 18	Phone:	41 1 755 6161
Schlieren	Fax:	41 1 755 6160
8952 Zurich Switzerland		

COMPANY OVERVIEW:

Business Brief: Researcher and developer of antibody-based products for the treatment of unmet clinical needs such as cancer.

Founded: 9/2000 **Status:** Acquired/Merged

Employees: 30 **Stage:** Clinical Trials - Generic

Spinout of: Swiss Federal Institute of Technology

Industry Codes / Industry SubCodes:
 Biotechnology Therapeutics / Immunotherapy
 Drug Development Technologies

FINANCING STATUS:

Description: As of 7/05 The company was acquired by Roche Holding (XETRA: RHO) for CHF 235M in cash on July 26, 2005.

INVESTORS:

Investment Firm	Participating Round #(s)
AAC Capital Partners Holding BV	6
Affentranger Associates SA	
BioMedPartners AG	6
Deutsche Venture Capital	6
Gilde Healthcare Partners	6
Global Life Science Ventures	6
Lombard Odier & Cie	1
Novartis Venture Fund	1*, 2*, 5*, 3*, 4*, 6
Quester	6
Roche Holding	8*
Roche Venture Fund	7

* = Lead Investor

FINANCINGS TO DATE:

Round	Round Type	Date	Amount	Post	Company Stage	Round
https://www.venturesource.com/query/coDet.cfm?eid=608251						

Success Factors of Early-Stage Venture Capital Investments

Round	Round type	Date	Raised (MM)	Valuation (MM)	Company stage	Detail
1	1st	16-Mar-01	€ 1.95	W/H	Startup	VIEW
2	Bridge	15-May-02	€ 1.37	N/A	Product Development	VIEW
3	Corp	15-Jun-03	€ 1.30	W/H	Product Development	VIEW
4	Bridge	15-Jun-03	€ 0.65	N/A	Product Development	VIEW
5	Second	15-Jun-03	W/H	N/A	Product Development	VIEW
6	2nd	26-Nov-03	€ 11.55	W/H	Product Development	VIEW
7	Corp L	21-Sep-04	N/A	N/A	Clinical Trials - Generic	VIEW
8	ACQ	26-Jul-05	N/A	€ 150.80	Clinical Trials - Generic	VIEW

FINANCIALS:

Year	Revenue Low (MM)	Revenue High (MM)	Net Income Low (MM)	Net Income High (MM)	Burnrate (Month)	Status
2002					€ 136360	Actual

EXECUTIVES AND BOARDMEMBERS:

Current Executives and Boardmembers

Name	Title	Background	Contact
Rudi Neirinckx	COO & Head, Business Development	Date joined: 9/02 President & CEO, Atugen; COO, PAR Pharmaceuticals; Head, New Business Development, Merck; Head, Clinical Development, Ciba Geigy; Senior Executive, Serono; Senior Executive, Amersham International	41 1 755 6161
Pablo Umana	Chief Scientific Officer	Date joined: 9/00 Scientist, ETH-Zurich; Scientist, University of Manchester	41 1 755 6161
Karen Wagner	Vice President, Technology Licensing	Director, Business Development, Ingenium Pharmaceuticals; Management consultant, McKinsey & Company	kwagner@ysioscapital.com
Peter Brukner	Director, Monoclonal Biology		41 1 755 6161
Edwin de Graaf	Board Member, Institutional Investor	Date joined: 12/03 Investment Director, Gilde Investment Management	31 30 219 25 39 degraaf@gilde.nl
Juerg Meier	Board Member, Institutional Investor	Executive Director, Novartis Venture Fund	
Peter Reinisch	Board Member, Institutional Investor	Managing Director, Global Life Science Ventures	41 41 727 19 30 p.reinisch@gslsv-vc.com
William Jenkins	Board Member, Outsider	Date joined: 4/04 Executive, Pharmaconsulting	41 1 755 6161
David Karabelnik	Board Member, Outsider	Managing Director, Breslin AG	41 44 3864020 karabelnik@breslin.ch
Thomas Rinderknecht	Board Member	Partner, Rinderknecht Klein & Stadelhofer	

<https://www.venturesource.com/query/coDet.cfm?eid=608251>

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Investor,
Outsider

Former Executives and Boardmembers

Name	Title	Background	Contact
Joel Jean-Mairet	Former President & CEO	Date joined: 9/00	jjean-mairet@ysioscapital.com
Andreas Emmenegger	Former Chief Financial Officer	Date joined: 3/05 CFO, The Fantastic Corporation; CFO, Interroll; Executive, Dräger	
Klaus Breiner	Former Board Member, Venture Investor	Date joined: 12/03 Investment Manager, Global Life Science Ventures	

BUSINESS INFORMATION:

Overview: Researcher and developer of antibody-based products for the treatment of unmet clinical needs such as cancer. The company uses its proprietary set of technologies to endow therapeutic antibodies with competitive advantages. The Company has developed glycoengineering technology (GlycoMAb) to boost a natural mechanism of action of therapeutic antibodies developed to mediate target cell killing. In addition to GlycoMAb, GLYCART has developed additional proprietary technologies covering all key elements of the monoclonal antibody value chain in order to streamline its product development efforts while minimizing potential royalty stacking.

Customers: The company's target customers include developers of therapeutic antibodies for target cell killing applications as well as all major biotechnology and pharmaceutical companies working with antibodies.

Market: There are currently five antibodies marketed in the US for the treatment of cancer, all of them approved in the last 5 years. Nine anti-cancer antibodies are currently in phase III trials or under FDA review. According to industry sources, the market share of antibody-based therapies within the cancer market is expected to expand from 7 per cent in 1999 to 22 per cent in 2005 (IMS). Approximately 1000 antibodies could enter the clinic in the next 10 years of which approximately 40 per cent falling in that class which could benefit from GlycoMAb. Currently monoclonal antibodies represent around 25 per cent of all biopharmaceuticals in development with a market potential of \$15 billion in 2006.

Competition: The company's competition includes Neose.

OUTSIDE PROFESSIONALS:

Auditor	Local Auditor
General Counsel	Rinderknecht Klein & Stadelhofer

*** END OF REPORT – GlycArt Biotechnology ***
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9.4. Sample LinkedIn Profile of a Board Member

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Rudi Neirinckx

CEO at Ennar Pharma AG

Basel Area, Switzerland | Pharmaceuticals

Previous **Altana, Merck KGaA, MERCK KGaA**

Education **Ph.D., Life sciences at Universiteit Gent**

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48
connections

ch.linkedin.com/pub/rudi-neirinckx/4/235/320

Summary

Develop a novel safe and efficacious treatment of psoriasis. I have the world wide patents for the novel treatment, which might lead to a cure. We are presently working on a capital increase for the company

Specialties

Novel drugs, business development, project evaluation, patenting, business plan preparation, oncology, nuclear medicine, clinical trial management, biotechnology, IPO preparation.

Experience

CEO

Ennar Pharma AG

March 2010 – Present (2 years 7 months)

Development of a proprietary, novel psoriasis treatment based on innovative mode-of-action

Consultant to President

Altana

Public Company, 5001-10,000 employees; Pharmaceuticals industry

January 2004 – January 2007 (3 years 1 month)

Consultant

Altana

2003 – 2007 (4 years)

Head Business development

Merck KGaA

1996 – 1999 (3 years)

Head M&A and BD

MERCK KGaA

1995 – 1998 (3 years)

Education

Universiteit Gent

Ph.D., Life sciences

1962 – 1969

Universiteit Gent

chemistry

1962 – 1966

Activities and Societies: MSc in Science

Additional Information

Groups and
Associations:



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9.5. Statistical output

H1 – Successful early-stage companies have higher levels of human capital compared to unsuccessful early-stage companies.

1. Kolmogorov-Smirnov Test

Sample of successful venture capital backed companies

One-Sample Kolmogorov-Smirnov Test^c

		Human_Capital _Av
N		66
Normal Parameters ^{a,b}	Mean	,8152
	Std. Deviation	,56384
Most Extreme Differences	Absolute	,159
	Positive	,159
	Negative	-,074
Kolmogorov-Smirnov Z		1,295
Asymp. Sig. (2-tailed)		,070

a. Test distribution is Normal.

b. Calculated from data.

c. Indicator for success = successful

Result: $p > 0,05$ which means that the data follow a Gaussian distribution.

Sample of unsuccessful venture capital backed companies

One-Sample Kolmogorov-Smirnov Test^c

		Human_Capital _Av
N		127
Normal Parameters ^{a,b}	Mean	1,0142
	Std. Deviation	,60168
Most Extreme Differences	Absolute	,159
	Positive	,159
	Negative	-,064
Kolmogorov-Smirnov Z		1,789
Asymp. Sig. (2-tailed)		,003

a. Test distribution is Normal.

- b. Calculated from data.
- c. Indicator for success = unsuccessful

Result: $p < 0,05$ which means that the data do not follow a Gaussian distribution.

2. Mann-Whitney U test

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Human_Capital_Av	193	,9461	,59512	,00	2,60
Indicator for success	302	,38	,486	0	1

Ranks

Indicator for success		N	Mean Rank	Sum of Ranks
Human_Capital_Av	unsuccessful	127	103,16	13101,50
	successful	66	85,14	5619,50
	Total	193		

Test Statistics^a

	Human_Capital_Av
Mann-Whitney U	3408,500
Wilcoxon W	5619,500
Z	-2,139
Asymp. Sig. (2-tailed)	,032

a. Grouping Variable: Indicator for success

Result: $p = 0,016$, i.e. $p < 0,05$ which means a significant result was found and the alternative hypothesis can be confirmed, however given the mean ranks, unsuccessful companies have a higher level of human capital.

H2 – Successful early-stage companies have higher levels of education compared to unsuccessful early-stage companies, on an average basis.

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Education level	235	,37	,485	0	1
Indicator for success	302	,38	,486	0	1

1. Mann-Whitney Test

The prerequisite of metric variables is not given, i.e. Mann-Whitney test is performed straight away.

Ranks

Indicator for success		N	Mean Rank	Sum of Ranks
Education level	unsuccessful	145	111,28	16135,00
	successful	90	128,83	11595,00
	Total	235		

Test Statistics^a

	Education level
Mann-Whitney U	5550,000
Wilcoxon W	16135,000
Z	-2,296
Asymp. Sig. (2-tailed)	,022

a. Grouping Variable: Indicator for success

$p = 0,011$, i.e. $p < 0,05$ which means a significant result was found and the alternative hypothesis can be confirmed.

H3 – Successful early-stage companies have higher levels of prior entrepreneurial experience compared to unsuccessful early-stage companies, on an average basis.

1. Kolgomorov-Smirnov test

Sample of successful venture capital backed companies

One-Sample Kolmogorov-Smirnov Test^c

		Previous start-up/entrepreneurial experience
N		113
Normal Parameters ^{a,b}	Mean	,42
	Std. Deviation	,904
Most Extreme Differences	Absolute	,430
	Positive	,430
	Negative	-,323
Kolmogorov-Smirnov Z		4,566
Asymp. Sig. (2-tailed)		,000

a. Test distribution is Normal.

b. Calculated from data.

c. Indicator for success = successful

Sample of unsuccessful venture capital backed companies

One-Sample Kolmogorov-Smirnov Test^c

		Previous start-up/entrepreneurial experience
N		179
Normal Parameters ^{a,b}	Mean	,20
	Std. Deviation	,575
Most Extreme Differences	Absolute	,486
	Positive	,486
	Negative	-,363
Kolmogorov-Smirnov Z		6,502
Asymp. Sig. (2-tailed)		,000

a. Test distribution is Normal.

b. Calculated from data.

c. Indicator for success = unsuccessful

2. Mann-Whitney Test

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Previous start-up/entrepreneurial experience	292	,28	,726	0	5
Indicator for success	302	,38	,486	0	1

Ranks

Indicator for success		N	Mean Rank	Sum of Ranks
Previous start-up/entrepreneurial experience	unsuccessful	179	140,63	25173,50
	successful	113	155,79	17604,50
	Total	292		

Test Statistics^a

	Previous start-up/entrepreneurial experience
Mann-Whitney U	9063,500
Wilcoxon W	25173,500
Z	-2,196
Asymp. Sig. (2-tailed)	,028

a. Grouping Variable: Indicator for success

$p = 0,014$, i.e. $p < 0,05$ which means a significant result was found and the alternative hypothesis can be confirmed.

H4 – Successful early-stage companies have higher levels of industry experience compared to unsuccessful early-stage companies, on an average basis.

1. Kolgomorov-Smirnov test

Sample of successful venture capital backed companies

One-Sample Kolmogorov-Smirnov Test^c

	Professional experience relevance
N	93
Normal Parameters ^{a,b}	
Mean	1,56
Std. Deviation	1,410
Most Extreme Differences	
Absolute	,256
Positive	,256
Negative	-,142
Kolmogorov-Smirnov Z	2,472
Asymp. Sig. (2-tailed)	,000

a. Test distribution is Normal.

b. Calculated from data.

c. Indicator for success = successful

Sample of unsuccessful venture capital backed companies

One-Sample Kolmogorov-Smirnov Test^c

	Professional experience relevance
N	158
Normal Parameters ^{a,b}	
Mean	2,63
Std. Deviation	1,786
Most Extreme Differences	
Absolute	,156
Positive	,156
Negative	-,078
Kolmogorov-Smirnov Z	1,962
Asymp. Sig. (2-tailed)	,001

a. Test distribution is Normal.

b. Calculated from data.

One-Sample Kolmogorov-Smirnov Test^c

		Professional experience relevance
N		158
Normal Parameters ^{a,b}	Mean	2,63
	Std. Deviation	1,786
Most Extreme Differences	Absolute	,156
	Positive	,156
	Negative	-,078
Kolmogorov-Smirnov Z		1,962
Asymp. Sig. (2-tailed)		,001

a. Test distribution is Normal.

b. Calculated from data.

c. Indicator for success = unsuccessful

2. Mann-Whitney U test

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Professional experience relevance	251	2,23	1,733	0	7
Indicator for success	302	,38	,486	0	1

Ranks

Indicator for success		N	Mean Rank	Sum of Ranks
Professional experience relevance	unsuccessful	158	143,30	22641,50
	successful	93	96,61	8984,50
	Total	251		

Test Statistics^a

	Professional experience relevance
Mann-Whitney U	4613,500
Wilcoxon W	8984,500
Z	-5,016
Asymp. Sig. (2-tailed)	,000

Test Statistics^a

	Professional experience relevance
Mann-Whitney U	4613,500
Wilcoxon W	8984,500
Z	-5,016
Asymp. Sig. (2-tailed)	,000

a. Grouping Variable: Indicator for success

Result: $p = 0,000$, i.e. $p < 0,05$ which means a significant result was found and the alternative hypothesis can be confirmed, however given the mean ranks, unsuccessful companies have a higher level of industry experience.

H5 – Successful early-stage companies have higher levels of management experience compared to unsuccessful early-stage companies, on an average basis.

1. Kolgomorov-Smirnov test

Sample of successful venture capital backed companies

One-Sample Kolmogorov-Smirnov Test^c

	Previous senior management experience
N	86
Normal Parameters ^{a,b}	
Mean	1,17
Std. Deviation	1,239
Most Extreme Differences	
Absolute	,277
Positive	,277
Negative	-,172
Kolmogorov-Smirnov Z	2,568
Asymp. Sig. (2-tailed)	,000

a. Test distribution is Normal.

b. Calculated from data.

c. Indicator for success = successful

Sample of unsuccessful venture capital backed companies

One-Sample Kolmogorov-Smirnov Test^c

		Previous senior management experience
N		157
Normal Parameters ^{a,b}	Mean	1,45
	Std. Deviation	1,389
Most Extreme Differences	Absolute	,218
	Positive	,218
	Negative	-,149
Kolmogorov-Smirnov Z		2,735
Asymp. Sig. (2-tailed)		,000

a. Test distribution is Normal.

b. Calculated from data.

c. Indicator for success = unsuccessful

2. Mann-Whitney Test

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Previous senior management experience	243	1,35	1,341	0	6
Indicator for success	302	,38	,486	0	1

Ranks

Indicator for success		N	Mean Rank	Sum of Ranks
Previous senior management experience	unsuccessful	157	126,57	19871,50
	successful	86	113,66	9774,50
	Total	243		

Test Statistics^a

	Previous senior management experience
Mann-Whitney U	6033,500
Wilcoxon W	9774,500
Z	-1,421
Asymp. Sig. (2-tailed)	,155

a. Grouping Variable: Indicator for success

Result: $p = 0,0775$, $p > 0,05$. H_0 hypothesis can be confirmed. Thus, there is no significant difference between the two samples.

H6: Successful venture capital backed companies are more likely to be backed by an investors' syndicate than unsuccessful companies.

1. Mann-Whitney Test

The prerequisite of metric variables is not given, i.e. Mann-Whitney test is performed straight away.

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Indicator for syndication	48	,71	,459	0	1
Indicator for success	48	,46	,504	0	1

Ranks

Indicator for success		N	Mean Rank	Sum of Ranks
Indicator for syndication	unsuccessful	26	25,96	675,00
	successful	22	22,77	501,00
	Total	48		

Test Statistics^a

	Indicator for syndication
Mann-Whitney U	248,000
Wilcoxon W	501,000
Z	-,999
Asymp. Sig. (2-tailed)	,318

a. Grouping Variable: Indicator for success

Result: $p = 0,159$, $p > 0,05$ H0 hypothesis can be confirmed. Thus, there is no significant difference between the two samples.

H7: Successful venture capital backed companies are more likely to have high-quality investors' syndicates involved than unsuccessful companies.

1. Mann-Whitney Test

The prerequisite of metric variables is not given, i.e. Mann-Whitney test is performed straight away.

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Quality of an investor	48	,73	,869	0	2
Indicator for success	48	,46	,504	0	1

Ranks

Indicator for success		N	Mean Rank	Sum of Ranks
Quality of an investor	unsuccessful	26	22,77	592,00
	successful	22	26,55	584,00
	Total	48		

Test Statistics^a

	Quality of an investor
Mann-Whitney U	241,000
Wilcoxon W	592,000
Z	-1,031
Asymp. Sig. (2-tailed)	,302

a. Grouping Variable: Indicator for success

Result: $p = 0,151$, $p > 0,05$ H0 hypothesis can be confirmed. Thus, there is no significant difference between the two samples.

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