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## **Corporate Venture Capital** Factors underlying the success of CVC-backed companies in Europe

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## **Declaration master's thesis**

I declare that this thesis has been composed by myself and describes my own work, unless otherwise acknowledged in the text.

Venice, 

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## **Abstract**

Powerful long-established players desperately chase disruptive ventures yearning to grab a piece of their bespoke innovation. Investing billions in them, in the form of Corporate Venture Capital (CVC) funds, corporations want to know how to enhance synergies, increase returns and guarantee foreseeable progress.

The present master thesis examines the factors underlying that progress and how successful CVC-backed companies in Europe are. The research attempts to shed light on a mixture of qualitative and quantitative determinants for successful CVC exits – defined as Initial Public Offering, merger or acquisition.

The author defines eight independent variables, hypothesizing their correlation with the successful exits. Given the dichotomous nature of the test, logistic regression and supporting statistical models are employed. Results show that over the defined 24-year period the size of the CVC investment, the investor experience, the level of intellectual property protection and the country-specific entrepreneurship activity express strongest correlation to the outcome of an investment. Most of the deals are closed in the high-tech and semi-conductors industry in the busiest by far country - Germany, shadowed by the UK and France. Overall, slightly below 40% of the CVC-backed companies reach one of the three success stages.

**Keywords:** Corporate Venture Capital, logistic regression, success, IPO, Europe, M&A

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## List of abbreviations

CAGR	Compound Annual Growth Rate
CDF	Cumulative Distribution Function
CFO	Chief Financial Officer
CV	Corporate Venturing
CVC	Corporate Venture Capital
DAX	Deutscher Aktienindex
FinTech	Financial Technology
FSE	Frankfurt Stock Exchange
GEM	Global Entrepreneurship Monitor
GLM	Generalized Linear Model
HQ	Headquarters
IoT	Internet of Things
IPO	Initial Public Offering
IPP	Intellectual Property Protection
IRR	Internal Rate of Return
IVC	Independent Venture Capital
LBO	Leveraged Buyout
M&A	Mergers and Acquisitions
OLS	Ordinary Least Squares
PE	Private Equity
PWC	PricewaterhouseCoopers
R&D	Research and Development
RegTech	Regulatory Technology
ROIC	Return on Invested Capital
S&P	Standard and Poors
SaaS	Software as a Service
TEA	Total Early-Stage Entrepreneurship Activity
USP	Unique Selling Proposition
VC	Venture Capital
WACC	Weighted Average Cost of Capital

# 1. Introduction

## 1.1 Economic context

Today's competitive landscape presses incumbent enterprises to react quickly and more flexibly to upstart disruptive companies. Game-changing innovators can trigger shocks which might replace the „old dogs” from the scene and completely rewrite the rules in an entire industry. A proactive approach towards „taming unicorns” is crucial if long-established corporations want to remain competitive. Therefore, they should overcome its structural barriers and provide necessary resources for strategic development.<sup>1</sup>

The development of new technologies is both capital intensive and risky, as their success depends on many external and internal uncertainties. The focus is always on market-changing developments, in contrast to the more continuous development of products. Without sufficient resources, the implementation of innovative ideas cannot be realized. Logically, efficient innovation is a central goal of established companies and one of the channels to accomplish it is through Corporate Venture Capital (CVC). This approach, which has been used since the early 1960s, signifies cooperation between established firms and start-ups in order to stimulate joint growth.<sup>2</sup> Pioneered by well-known titans of the American pharmaceutical and technology industry the investments in risky start-ups have gained in importance. Although historically prone to boom and bust cycles, CVC has taken a root across a broad span of industries and countries. Looking deeper into the companies behind the key stock indices in the wealthiest nations around the world one can get to the conclusion that CVC arms are actually not that uncommon. Germany, for instance, with its most important blue chip stock index - Deutscher Aktienindex (DAX), is the perfect example for the relevance of CVC nowadays. More than 70% of the companies comprising the index have distinctive CVC arms, the rest either have some form of Venture Capital (VC) entity or invest strategically through their Mergers & Acquisitions (M&A) departments. Consider Hydra Ventures (Adidas's CVC arm), BMWi Ventures (BMW's CVC arm), Deutsche Telekom

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<sup>1</sup> Duffner (2005), p. 16

<sup>2</sup> Schrottke (2005), p. 1

Capital Partners (Deutsche Telekom's CVC arm) and many others that invested billions within and outside the European borders. From an even broader perspective Google Ventures, Intel Capital, Qualcomm Ventures are the core players setting the trends in the CVC industry. The presence of CVC initiatives behind the companies in the most relevant indices in the US is even more obvious. Technology companies are those that are most active on the horizon in terms of deal count and investment size. Solely in 2017 the US activity with CVC participation surpassed \$36bn and hit more than 1400 deals.<sup>3</sup> Europe on the hand is lagging behind with close to €8bn invested and 804 deals closed.<sup>4</sup>

So massive amounts of capital into new companies with unproven track record might sound risky but over the years it has proven to work although its success is questioned by many. Corporations invest in start-ups not just for the sake of spending money but to take some advantages of it. Peculiarity of CVCs is that unlike Independent Venture Capital (IVC) funds, CVC arms put in the foreground the strategic fit of an investment. In other words an investment might not bring exceptionally high monetary returns at first sight but might add substantial strategic value to the main business of the corporation. This could be penetration in new markets, new segments, to act supplementary to a specific business area or even a marketing/PR effect etc.

Big corporations have the capacity to inject funds into ventures a series of times and also fail without even jeopardizing their business operations and financial results. Given the nature of venture investments, which are smaller in terms of amounts compared to a typical Private Equity (PE) fund for instance, corporations have the flexibility to "neglect" some bad investments and go over them. On the other side of the coin are the money recipients though. They are vulnerable to monetary changes and easily dependent on their budget. What connects big corporations with such small and unproven start-ups? Undoubtedly, that is the bespoke know-how and innovative spirit young ventures have. How successful are the funded companies in Europe eventually? How to measure their success? What determinants trigger and bring forward an investee after receiving CVC investment? These are just some of the questions that come to someone's mind when thinking of CVC investees.

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<sup>3</sup> Venure Monitor 2018 Q3, p. 19.

<sup>4</sup> European Venture Report 2018 Q3, p. 5.

## 1.2 Research question and contribution

The objective of this thesis is to present a comprehensive picture of the determinants underlying the success of CVC-backed companies in Europe. The analysis focuses on a period of 24 years, spanning from January 1, 1990 until December 31, 2014. Bearing in mind the year in which this work is prepared, 2014 was chosen on purpose based on the general understanding that 3 to 4 years are necessary on average for an investor to exit its investment. Following the example of preceding studies (i.e. Park and Steensma, 2012; Kräussl and Krause, 2011; Shane and Stuart, 2002), this analysis uses the type of exit of a particular company as a measure of CVC investment success. Exits in the form of Initial Public Offering, merger or acquisition are considered successful. This paper bases its research on a unique sample of CVC deals exclusively headquartered in Europe, both investor's and investee's headquarters. Companies having its corporate home outside Europe and/or performed any deals after/before the stated period are beyond the scope of this research.

This work's main aim is to find a relationship between pre-defined factors and the exit type. In other words, this paper should answer the following question:

*What are the main factors underlying the success of CVC-backed companies in Europe?*

In order to answer the research question the author constructs 8 different hypotheses which will set the framework of the research and limit the area of investigation. They are carefully selected based on the available data with the aim of providing an optimal outcome for the research question.

The results of this thesis will add value to the current state of academic research in multiple ways. Several managerial implications can be derived from the results. CVC investors will benefit reading it since it will broaden their knowledge on the matter. Fund managers will be able to allocate their funds more wisely and to pick the right amount and time necessary to achieve the highest synergy between his company and the target. Furthermore, importance has to be given to the strategy behind each investment and how close it is to the main business of the CVC investor. Financial returns do not play main role in this type of investments. Corporations will be more informed on eventual synergies and potential benefits of investing in companies that share the same industry.

It will enlighten investors on whether the investment amount has impact on the successful development of the investees. Managers will learn to not be overconfident regarding their investments in infant companies and will get better understanding of how likely investees are to get merged, acquired or even listed. Additionally, investors will be able to assess if the industry invests mainly in their home lands or in neighboring countries and even farther from their borders. The advantages of the local network should be taken into consideration when assessing new investment.

Corporate Venture Capital is considered a subsector of Venture Capital. That is why the thoughts expressed in this thesis should contribute to the relevant academic area of Venture Capital. Prominent names from the field have already written some research combined with empirical analyses on CVC. Such examples are the papers by (Gompers and Lerner, 1998; Hellmann, 2002; Dushnitsky, Lenox, 2006; Chemmanur et al. 2014; Park and Steensma, 2012 and others). To the best of author's knowledge, this analysis is the one of the few papers concentrating on the factors underlying the success of CVCs in Europe for such a long-spread period.

### **1.3 Thesis outline**

The author of this thesis has the goal to acquaint the reader with the Corporate Venture Capital world specifically on the business in continental Europe. Its focus lies on determining the factors underlying the success of CVC-backed companies over a 24-year period.

In contrast to VC, the subsection CVC has been investigated theoretically and empirically only to a small extent. This applies primarily to Western Europe while in the eastern part of the old continent this industry is barely defended in corporate finance.

At the outset of this thesis, in chapter 2, is provided a comprehensive overview of Corporate Venture Capital and the theory related on the matter presented from different perspectives. Its differentiation from the "classic" Venture Capital is presented in combination with a list of motives supporting the engagement into CVC. How established corporation think of CVC and what their potential partners – the young ventures perceive by this form of investing. Furthermore, the current state of research and major

findings of well-known academics have been reviewed and presented in an understandable and concise format.

In chapter 3 the author develops eight hypotheses which aim at giving better clarity over the CVC industry and what the determinants behind CVC-backed investments are. The hypotheses, based on a manually-filtered data sample, are tested for validity. Chapter 4 builds upon that and presents the process of sampling the data together with defining the research methodology. Success is set as dependent variable against eight different carefully selected predictors and their „interaction” is analyzed. The used model – logistic regression is presented and the author touches on OLS and probit models.

Next, chapter 5, is oriented towards demonstrating the results of the empirical test. Analysis is performed on R Studio and the results section starts with sketching the industry characteristics and trends in CVC. A concise illustration of the most relevant descriptive statistics is shown and the regression results discussed and demystified. A direct comparison between the expected hypothesis outcome and the actual ones follows afterwards.

All this is rounded off with a final consideration in the form of conclusion, summarizing the main contribution and results of the thesis.

## **2. Overview of Corporate Venture Capital**

This chapter introduces the basics of CVC financing. In the first step, the topic of Corporate Venture Capital is defined and differentiated from the superordinate financing family of Venture Capital. Subsequently, Corporate Venture Capital is further subdivided and the motives for Venture Capital are shown.

The conclusion of the second chapter is an overview of the current state of scientific research, discussion of academics' findings on CVC and a literature review.

### **2.1 Classification of Corporate Venture Capital in the corporate finance field**

#### **2.1.1 Definition of Corporate Venturing**

The term "Corporate Venturing" (CV) is used inconsistently in both the academic and professional environment. In dictionaries, the term "Venture" is synonymous with "dare" and "risk", indicating a higher risk of default (compared to other assets) with greater potential for development though. In this work, the term "Venture" refers to mostly technology or service-oriented start-up companies that are characterized by their innovation, flexibility and technological knowledge. Furthermore, they have unexploited growth potential. Ventures can be structured differently from organizational and legal point of view, but what they always have in common is their organizational separation from an established company (also known as incumbent). By nature they do not depend on corporation's money and legal basis.<sup>5</sup>

The term "Corporation" (or also "Corporate") refers to companies that are established in at least one market and have a broad customer base. They also have well-established structures and optimized internal processes.<sup>6</sup> The meaning the author puts behind the term is big and well-known corporations usually present in multiple countries.

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<sup>5</sup> Neubecker (2006), p. 12; Banik (2004), p. 2.

<sup>6</sup> Schrottke (2005), p. 59 ff.

Through Corporate Venturing takes place the establishment of a new type of activity alongside an already existing corporate organization. Thus, CV serves to promote and assist both company-external and internal start-ups.<sup>7</sup>

Compared to the traditional core business of a corporate, CVC entities go together with significantly higher uncertainties<sup>8</sup> regarding the development of venture activity. Corporate-sponsored VC activities are built with the long-term intention to strategically expand the company's horizons and increase business revenue, profitability, efficiency and quality. CV is intended to generate business growth and increase the number of innovations in established companies. In addition, the entrepreneurial spirit of the start-up company should be strengthened. Ventures can take various forms in organizational and legal terms. They are characterized by financial, resource-related and legal interaction, which is limited to operational support through infrastructure, distribution channels and market access.<sup>9</sup>

Depending on the type of interpretation, CV encompasses several disciplines: these include entrepreneurship, technological and operational support as well as financing. Entrepreneurship serves as a driver for the realization of an innovation and is considered by great majority of the literature as an integral part of CV initiatives.<sup>10</sup>

According to Birkinshaw, Batenburg and Murray (2002), CVC is a continuous process in which corporations manage start-ups, add value and exit at the right time.<sup>11</sup>

### **2.1.2 Possible configurations of Corporate Venturing**

The process of defining the term CV reveals that this term is defined differently in the literature. Some sources use it as a synonym for venture projects, which are operated exclusively in-house. Other literary sources interpret CV as corporate-external innovation activities. Again, other authors use CV as a generic term for all corporate venture projects. Within the scope of this thesis, if not state otherwise in the text, CV is understood in the sense of the last definition as a generic term for all corporate venturing (internal and external) of established companies. With the course of this work, the readers

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<sup>7</sup> Miles, Covin (2002), p. 27 ff.

<sup>8</sup> Default risk, lower sales than originally planned and the like.

<sup>9</sup> Schrottke (2005), p. 2.; Block, MacMillan (1993), p. 14.

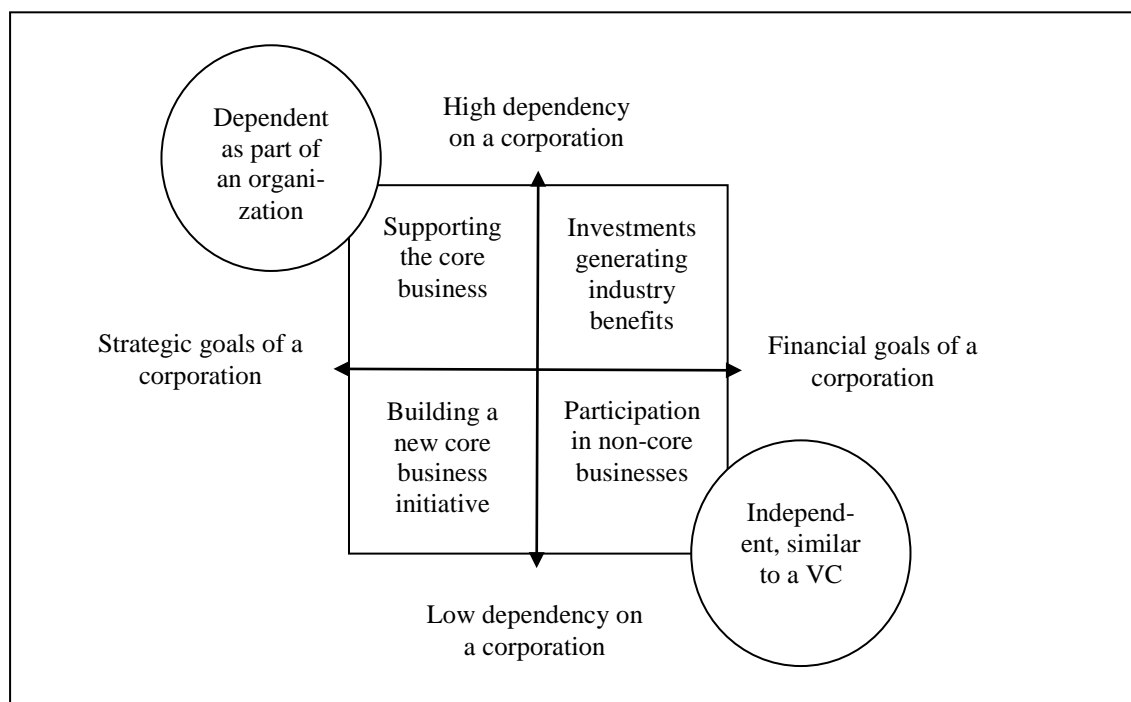
<sup>10</sup> Schrottke (2005), p. 2.

<sup>11</sup> Birkinshaw, Batenburg, Murray (2002), p. 12 ff.



will notice that the vast majority of the examples are related to company-external ventures. The author mostly sticks to the definition given by Chesbrough (2002) who states that the term is used to describe investment of corporate funds directly in external start-up companies.<sup>12</sup>

The lines between internal and external venturing are sometimes rather blurred: The connection between corporations and ventures takes place at the interception of the axes "goals" and "connection to the group": Within this field of interception, the concerned groups are in different quadrants and try to put through their claims. Depending on the weight, the CVC unit is positioned in one of the following quadrants in Figure 1:



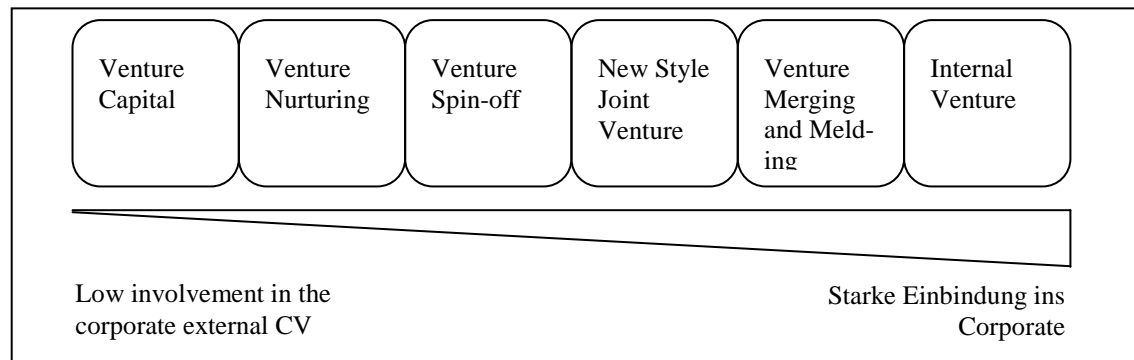
Source: adapted from Freese (2006) p. 27.

**Figure 1: Interception between corporations and independent VCs**

Roberts (1980) also differentiates between six forms of Corporate Venturing on a scale of low to high involvement within the parent company. However, he believes internal CV belongs to a separate category. In general, it is clear that internal ventures receive more support, while external ventures have greater decision-making autonomy.<sup>13</sup>

<sup>12</sup> Chesbrough (2002), p. 5.

<sup>13</sup> Roberts (1980), p. 136.



Source: adapted from Freese (2006), p. 17. Roberts (1980), p. 136.

**Figure 2: Involvement of the venture in the parent company**

The separate forms are defined as follows:<sup>14</sup>

- 1) In the context of Venture Capital, the corporate is primarily focused on the financing performance and hopes to get some insight into new technologies.
- 2) When it comes to Venture Nurturing on the other hand, the start-up company is also offered a sort of management support and leadership guidance.
- 3) In a Venture Spin-off, development products are to be split up that do not fall into the parent company's core business or carry a high level of risk. Through this way, investors can bring funds and knowledge into the start-up specifically for their needs.
- 4) A New Style Joint Venture is to enable rapid penetration of technology-driven products in international markets. The start-up company brings along enthusiasm, flexibility, entrepreneurial action (with appropriate obligations) and specific, far-reaching technological knowledge. In addition to capital and capital market access, corporations have international channels for marketing, distribution and sales channels. The venture could not use this infrastructure without the active support of the corporation. The venture lacks both the necessary market coverage and a sales organization that exceeds regional structures.
- 5) Venture Merging & Melding is designed to systematically develop and eventually take over the venture in order to lead the corporation in various directions. A clear differentiation to the other forms cannot be identified in this approach.<sup>15</sup>

<sup>14</sup> Roberts (1980), p. 136.

<sup>15</sup> Ibid.

### 2.1.3 Internal Corporate Venturing

When it comes to internal ventures, a corporation creates an internal virtual entity that is detached from the rest of the organizational structure of the corporation with the aim of exploiting the innovative nature of the venture in a targeted manner. In the internal ventures, parts of the company's own research and development are thus created by separate business units within a company. In doing so, the company tries to build a connection between the entrepreneurial orientation and the behaviour of the existing enterprise. Internal ventures bring together entrepreneurial people, technology and specific expertise to maximize their collective potential.<sup>16</sup>

This approach seeks to embed entrepreneurial behaviour within the existing incumbent.<sup>17</sup> Control lies exclusively in corporation's power. The role of the head of an internal venture<sup>18</sup> is similar to that of an external venture, but in a slightly different environment.

### 2.1.4 External Corporate Venturing

External ventures can develop more independently than internal ventures and are thus (at least directly) not exposed to the specific influence points of the parent company. This independence fosters access to new products and technologies that are not available within the group.<sup>19</sup>

External CV encompasses the venturing activities of start-ups outside the (actual) organization of the incumbent, allowing big corporations to gain insight into new technological developments, markets or know-how.<sup>20</sup>

In principle, external CVs can be operated in several forms: the research and development (R&D) activities can be run as an independent (external) company. Here is where cooperation opportunities occur. The parent company is granted far-reaching voice, information and control rights, which can be used to pursue and push through strategic

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<sup>16</sup> Sharma, Chrisman (1999), p. 19; Block, MacMillan (1993), p. 30.

<sup>17</sup> Schrottke (2005), p. 98 f.

<sup>18</sup> Also known as „Venture Champion“ in Greene et al. (1999),

<sup>19</sup> Seeliger (2004), p. 14 f.; Schrottke (2005), p. 100 ff.

<sup>20</sup> McNally (1997), p. 37.

goals. In the context of CVC, strategic fit is a key term. Cooperation can be used to build up and maintain innovation networks and thus relationship networks.<sup>21</sup>

Large companies often form specialized CV units that look after start-up companies. The major challenge for the specialized CV units is not so much the identification of suitable start-ups but rather building a strong bond in the relationship between the CV unit and the parent company. Furthermore, the exit from the investment, the long-term support from the parent company and the retention of qualified personnel are considered central for the success of the CV unit.<sup>22</sup>

When recruiting personnel, VC „donors” rely on past achievements-proven track record. VC managers are difficult to recruit because they need a deep understanding of the parent company's goals and needs and culture as a large business. Successful VC managers must have the following characteristics:<sup>23</sup>

- Credibility within the parent company.
- Willingness and ability to spend sufficient time with the parent company to understand its needs and communicate them to the VC community in the external network, thereby increasing the number of investment opportunities.
- Willingness to achieve consensus on hot topics between the CVC unit and the parent company.

Corporations face a number of challenges in particular with respect to the salary of the supervising managers: Measuring performance problems arise against the background of the strategic goals. In order to prevent internal conflicts, companies also set up remuneration systems for CV managers that are comparable to other business units within the company. CV managers are compensated to a large extent with fixed salaries. This is in contrast to VC managers, which are often compensated with 2 percent of the managed fund and 20 percent of the profit earned.<sup>24</sup> As a result, VC managers are encouraged to engage in an early-stage and therefore riskier financing to start-ups, while CV managers

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<sup>21</sup> Ernst & Young (2008), p. 1–5.

<sup>22</sup> Ibid., p. 1–5.

<sup>23</sup> Ibid., p. 7.

<sup>24</sup> The so-called “Two and Twenty” compensation model which is common for hedge funds managers and private equity firms in general.

are less motivated to take greater risks due to their fixed salary.<sup>25</sup> It is a matter of motivation.

Thus, parent companies face the following challenges:<sup>26</sup>

- Identification of the right strategy and financial goals for the specialized CV unit: In order for the CV unit to best understand the needs of the parent company and, accordingly, to make optimal strategic funding, the CV unit should be as close as possible to the parent company
- Establishment of a relationship structure between the CV unit and the parent company, which pursues these goals efficiently
- Recruitment and retention of employees who understand both venture capital in the broader sense and the needs of the corporation
- Measuring success in achieving the goals of the parent company

### **2.1.5 Corporate Venture Capital as a source of financing for start-up companies**

As with Corporate Venturing, Corporate Venture Capital has not received an unambiguous definition.<sup>27</sup> According to the overwhelming majority of CVC sources, CVC is defined as when an established industrial company provides financial resources to an innovation-oriented start-up. Financial resources can be in the form of equity, debt or mezzanine capital. In addition, the incumbent company supports its venture with various support and services.<sup>28</sup> This early-stage financing is intended to bring the business idea to maturity, to realize it and to launch it on the market in the most efficient way. A central condition is that there are certain points of contact with the operational business of the Corporate Venture Capital provider with regard to research activity, which make synergies possible in the first place. The object that is to be developed (i.e. drug to be developed) should be novel and has often already overcome the first research barriers.<sup>29</sup>

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<sup>25</sup> Ernst & Young (2008), p. 8.

<sup>26</sup> Ibid., p. 6.

<sup>27</sup> Finke (2003), p. 13.

<sup>28</sup> These services include, for example, the sharing of infrastructure, the use of product distribution networks, management support, specific expertise, and strategic support, reputation, consulting and coaching.

<sup>29</sup> Wunderlin, Banik, Gayler (2009), p. 59 f.; Ernst, Witt, Brachtendorf (2005), p. 234 f.

CVC financing is granted directly by the (future) parent company. The CVC provider is looking for a long-term commitment and to „lock up” its money in late-stage investment rounds (i.e. series C and D). The focus is not only on the financial aspect though, but also takes into account the realization process of the idea to be developed. In addition to the investment, co-operation in the area of licensing or research sometimes takes place, resulting in close cooperation with specialized departments of the (future) parent company.<sup>30</sup>

In summary, CVC can be characterized as follows:

- Provision of capital directly by an established company or by a specialized department of an existing company.
- The capital provider pursues strategic and financial objectives, in which the strategic component receives higher priority.
- The CVC investor usually receives control or right to have a say and actively supports the start-up company through various ways.

### **2.1.6 Difference between Corporate Venture Capital and Venture Capital**

CVC is not a financing by an external fund maintained by an independent third party. CVC is thus, not fully congruent with Venture Capital. CVC can be understood though, as a sub-form of VC. The term VC generally refers to a time-limited financing of companies that are in their early stage development. In the early stage, a distinction is made between the two sub-stages "seed" and "start-up": In the seed phase, the innovative product and business ideas are defined and developed. The focus is therefore on financing research, development and on generating relevant market information. In this way, the potential success of a specific project could be estimated.<sup>31</sup> In the subsequent start-up phase takes place the financing of the project until the start of its production: The investments include product development, initial marketing concepts, the development of the necessary organizational structure and process preparations, etc.

In general, the ultimate goal of a VC investment is to maximize the value of its stake in the start-up. CVC on the other hand does not simply look into financial returns but is

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<sup>30</sup> Wunderlin, Banik, Gayler (2009), p. 59 ff.; Röper (2004), p. 27.

<sup>31</sup> Deville (2002), p. 6; Nathusius (2001), p. 57; Bachmann (1999), p. 12.

complemented by the strategic fit. Through the subscribed shares, the VC provider can actively co-steer and control.<sup>32</sup> In continental Europe, the term VC is usually somewhat broader than in the US and also includes growth and leveraged buyout (LBO) financing.<sup>33</sup>

## 2.2 Motives for the use of Corporate Venture Capital

As mentioned in the introduction, companies must be able to compete in a dynamic market environment. The markets are subject to structural change and fundamentally influence the behavior of the market players. Several trends can be observed:<sup>34</sup>

The opening of new markets<sup>35</sup> and the removal of trade barriers through the creation of free trade zones<sup>36</sup> lead to changes in existing markets and competition structures through both the entry of new players and new demand and value creation structures.

The further development of information and communication systems makes the transmission of information cost-effective and possible in real time. The networking of research and development activities and global data availability enable more and more global research activities.

The reduction of restrictions on international movement of capital, with the corresponding opening of national capital markets, leads to global competition for financial resources. More efficient bank risk management and the introduction of revised capital adequacy requirements Basel II and III to avoid systemic disruption due to micro or macro shocks led to changes in credit management. Corporate structures become more flexible as they break up in favor of smaller, decentralized units in a network organization, thereby promoting market forces within a company.<sup>37</sup>

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<sup>32</sup> Bachmann (1999), p. 12; Banik (2004), p. 1 ff.

<sup>33</sup> Trezzini (2005), p. 23; Banik, Ogg, Pedernana (2008), p. 17 f.

<sup>34</sup> Banik, Ogg, Pedernana (2008), p. 111–114; Müller (2003), p. 293 f.; Black, Wright, Bachman (1998), p. 22–26, cited in Schrottke (2005), p. 7 f.

<sup>35</sup> I.e. China, India, Russia and South-American states.

<sup>36</sup> I.e. EU, EFTA, NAFTA, Mercosur and AFTA.

<sup>37</sup> Banik, Ogg, Pedernana (2008), p. 102; Schmid (2003), p. 175.

## 2.2.1 Characterization of the market participants

### 2.2.1.1 Characteristic of young innovative companies

The term "Venture" refers to young, technology or service-oriented companies that were recently established or are still in the process of being established. Ventures intend to develop novel product or service ideas and successfully launch them in a corresponding market.<sup>38</sup>

Each start-up company ideally has strong growth potential. The origins of these companies are based on an innovative business idea whose market opportunities depend on the newly created benefits for the customers. The innovative nature of the product also entails an above-average risk of default and volatility, as the feasibility and acceptance of the product or service on the market can only be estimated inaccurately due to the lack of reference products.

Usually, a start-up company employs at the beginning only a few people who are characterized by deep specific knowledge, creativity and flexibility with regard to the changing company situation. Often in the beginning a start-up company is not perceived on the market and it can thereby concentrate first on the development and the definition of the target market. Young companies usually have not many valuable tangible assets and derive their company value from their know-how and human capital. The salary of young entrepreneurs is often dependent on the entrepreneurial success. Success, in turn, is conditioned by the knowledge, skill and competence of the founders. In addition, the understanding of the unique selling proposition (USP) and target markets is an indispensable prerequisite.<sup>39</sup>

Start-ups are usually characterized by strong growth orientation which is closely correlated to the pace with which revenue grows. Many company founders have knowledge gaps in the business areas of controlling, accounting, marketing, taxes and financing. It is not uncommon for the founders to become overburdened, hampering the development of growth potential and causing loss of motivation.<sup>40</sup> In this context the figure below illustrates the general development of young companies over time.

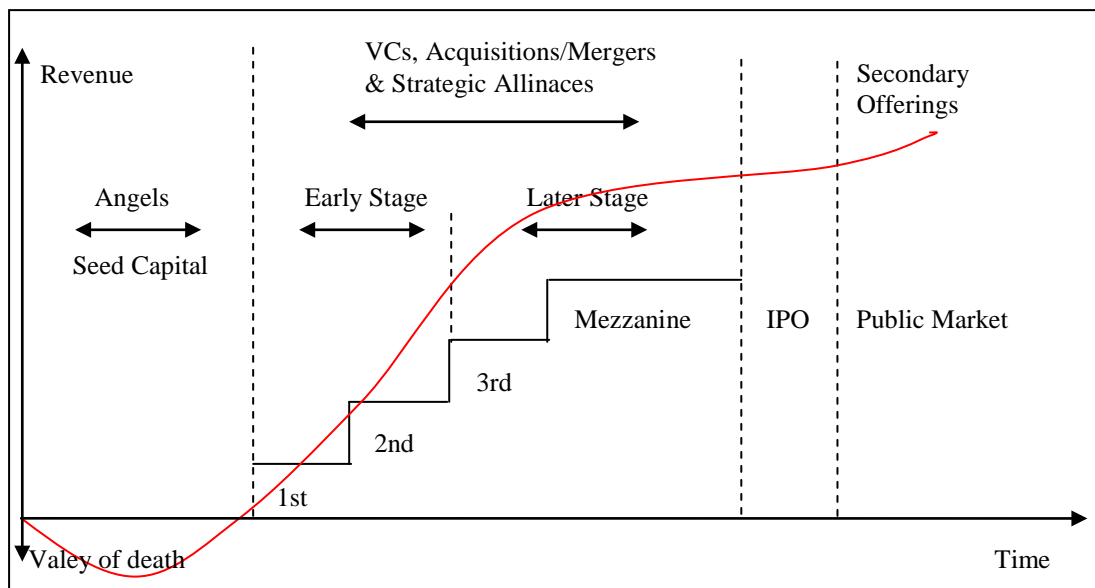
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<sup>38</sup> Nathusius (1979), p. 136 cited in Schrottke (2005), p. 59.

<sup>39</sup> Finke (2003), p. 26–31; Lessat, Hemer, Eckerle (1999), p. 86.

<sup>40</sup> Finke (2003), p. 30 ff.





Source: Novoa (2015) p. 1, accessed 02.02.2019

**Figure 3: Start-up financing cycles and revenue development**

Before financing rounds, usually the owner (idea generator) is the executive manager of the start-up company. With the establishment, there is the opportunity to implement your own creativity and the innovative idea. Founders are convinced of the effectiveness of their idea and pursue the goal of successfully implementing it and developing the start-up company quickly and successfully.<sup>41</sup>

At the beginning the funds necessary to boost growth usually cannot be derived from the operations of the business, as start-up companies generally have high initial payouts and cash outflows and only realize low revenues with a time delay. Therefore, the required investments must be made by reliable external parties, which can guarantee the availability of funds in the long run. Without sufficient resources, investment must be postponed, which eventually slows down the progress.<sup>42</sup>

When financing start-up companies, high risk premiums are generally applied. These result from the risk of the creditor, which consists of several components: lack of evaluation options of the business idea (no benchmark companies), only uncertainly estimable environmental development, missing or scarcely existing collaterals. Another point to consider is the resulting costs of asymmetric information distribution, which can be reduced by appropriate pecuniary and non-fiscal incentives and cost-generating moni-

<sup>41</sup> Finke (2003), p. 30.

<sup>42</sup> Ibid., p. 32–36.

toring, but cannot be completely eliminated. The remaining costs are the residual loss. The start-up company can also provide the external investor with funds for better bonding. Conventional penalties should be mentioned as a widely used and relatively simple measure to keep both parties aligned. As a result, the total cost of agents is composed of the monitoring and binding costs as well as the residual loss.<sup>43</sup>

The advantage of a start-up is greater, the faster the market entry takes place and the higher the performance differentiation to existing products. This happens on the one hand by a kind of "stamping" of the market and on the other hand by building of a network with major market participants, whereby certain market barriers for future potential competitors are established.<sup>44</sup>

### **2.2.1.2 Characteristics of established companies**

In this work, the term "Corporation" (or also "Corporate") refers to established companies that are successfully positioned with at least one product range in at least one market and can accordingly present an established customer base. A corporation should have an organizational structure, process organization and sufficient funds. It has personnel, material and financial resources in the form of employees, infrastructure and production facilities. Furthermore, it is experienced in dealing with management, production and marketing. In this position, a company wants to maintain or expand its existing comparative competitive advantage.<sup>45</sup> The creation of value-oriented growth serves to increase the enterprise value. To achieve that, revenues that are generated has to exceed the cost of capital.<sup>46</sup> Respectively, the profit margin is an important indicator when it comes to financial stability.

Growth generally determines the competitiveness of a company. An indispensable prerequisite for the competitiveness of a company are competitive advantages. These must be perceptible to the customer and can be divided into three categories:

- Greater customer benefit through new products, improved quality or optimized processes.

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<sup>43</sup> Banik, Ogg, Pedernana (2008), p. 127; Müller (2003), p. 33 f.

<sup>44</sup> Finke (2003), p. 36 f.

<sup>45</sup> Schrottke (2005), p. 14 f.

<sup>46</sup>  $ROIC > WACC$ .

- Lower costs through new technologies, optimized processes, other essential improvements or rationalization.
- Shortening the period of creating an innovation and market launching allows the use of a temporary monopoly position.

The dominant goal of established companies is to secure their present market position by strengthening their existing competitive advantages by further developing their current products and services. In order to develop related or new markets, acquisitions have to be considered, which would serve as growth drivers. In addition, restructuring measures can optimize processes and increase returns. These measures have a short-term positive effect and increase the market value of equity. However, a long-term repositioning of the company can only be limited by these measures and is not sustainable.<sup>47</sup>

Many large companies were innovative during their founding period. With increasing entrepreneurial success and growth, risks are often being avoided and the focus is primarily on maintaining the core business. The development of new products becomes of secondary importance. Thus, a turn-away from an organizational structure with entrepreneurial qualities in favor of bureaucratic such takes place in order to protect existing progress.<sup>48</sup>

Large corporations are mostly public and are characterized by an extinct separation between ownership and control. Over time they build up a substantial amount of tangible and intangible assets. Usually, such companies can approach professionally diversified human resources. The abilities of the employees are specifically trained for the requirements of the individual departments. Due to the broad financial pool available, capital-intensive projects can be realized whose economic success will only be achieved in the future. By doing so, economies of scale can be exploited. Furthermore, established companies have the necessary knowledge required for being successful on the market. In addition, they stand out for their reputation and network with service providers, state institutions and research institutions as well as their public past with extensive reporting. Another point that facilitates their operations is their easy

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<sup>47</sup> Schrottke (2005), p. 17 f.

<sup>48</sup> Hardyman, DeNino, Salter (1983), p. 116 ff.

access to the capital markets. Due to the rather broad field of activity, there is little dependence on individual markets, which is reflected in the relatively low risk premium. The major advantages of the size of the company and the abundance of resources contrast with the complexity of the corporate structure, whose formalism manifests itself in a hierarchical structure and standardized work processes.<sup>49</sup>

The ultimate control of the company rests with the owners, who demand appropriate compensation for the risk taken with their assets. In order to secure future returns, every company must therefore strive for sustained growth by expanding its existing market position and opening up new markets.<sup>50</sup>

Overall, established companies are characterized by stability, resource availability, well-established process structures and risk aversion. They pursue value-driven growth to increase their shareholder value. The basis for this growth is the previous, entrepreneurial success.<sup>51</sup>

In addition to the strengths listed above, large companies have some weaknesses: they can react to changing conditions only with a certain delay, since the adaptation of the new processes is extensive and cost-intensive. An established company always runs the risk of not opening up future markets. In the long term, such behavior leads to a decline in the company's success, as competition will increase due to a loss of patent protection, etc. The action and innovation capabilities of the established company will gradually decrease. Furthermore, quantitative targets promote short-term profit and do not necessarily lead to the long-term success of a company. The corporation also faces in-house principal-agent issues and a shortage of specialized, highly innovative employees.<sup>52</sup>

The distinctive division of tasks in large companies also hampers the ability to innovate, since often only standardized and long-proven manufacturing behavior is required. Innovative ideas are subjected to internal test procedures, which take into account not only the risk aversion mentioned above but also a rather small mistake tolerance in the

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<sup>49</sup> Finke (2003), p. 17–19; Schmidt, Terberger (1997), p. 438 f., cited in Finke (2003), p. 17–19.

<sup>50</sup> Finke (2003), p. 20 f.

<sup>51</sup> Henley (2005), p. 1; Schrottke (2005), p. 10; Schierenbeck (2000), p. 70–72.

<sup>52</sup> Ibid.; Finke (2003), p. 21–25.

final assessment. Large companies are thus more focused on routine and the room for maneuver by entrepreneurial-type employees is limited.<sup>53</sup>

Small businesses have quick decision-making processes, while corporation's decision-making is usually much more complex and sluggish. Often, ventures have a problem-solving culture, which can lead to misunderstandings and tensions.<sup>54</sup> On the other side, corporations pursue value-driven growth with the aim of generating value for their shareholders.<sup>55</sup>

The synergy potential between corporations and ventures becomes clearer in the following table:

Corporation	Venture
<p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>-Financial, material and human resources available</li> <li>-Experience in management, marketing, R&amp;D, production and logistics</li> <li>-Market position and reputation</li> <li>-Developed organizational structure and process organization</li> </ul>	<p><b>Weaknesses:</b></p> <ul style="list-style-type: none"> <li>- Scarce financial, material and human resources</li> <li>-Limited experience in management, marketing, R&amp;D, production and logistics</li> <li>-Lack of reputation, weak market position</li> <li>-Weak or not at all organizational structure and process organization</li> </ul>
<p><b>Weaknesses:</b></p> <ul style="list-style-type: none"> <li>-Rigid organizational structures that can lead to a certain inertia</li> <li>-Risk aversion of managers, which prevents innovation</li> <li>- R&amp;D focus primarily on the further development of already existing products and services</li> </ul>	<p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>-High level of motivation, flexibility and creativity</li> <li>-Innovation as the basis for business activity</li> <li>-State-of-the-art R&amp;D and specific innovative knowledge</li> </ul>

Source: own table

**Table 1: Comparison of strengths and weaknesses of corporation against venture**

What follows next is a presentation of the motives from both points of views - corporations' and ventures'.

### 2.2.2 Motives from the perspective of start-ups

As stated above, start-ups are characterized by a high degree of flexibility and know-how based on a technology or product idea.<sup>56</sup>

<sup>53</sup> Bhide (2000), p. 19; Maselli (1997), p. 141, cited in Finke (2003), p. 24.

<sup>54</sup> Roberts (1980), p. 138.

<sup>55</sup> McGrath et al. (2001), p. 5 ff.; Schrottke (2005), p. 8.

<sup>56</sup> Schrottke (2005), p. 10.

Entrepreneurs want to successfully launch their innovation on the market. However, financing often results in difficulties due to the high risks involved in developing an innovation and the insecurity that arises later on.<sup>57</sup> The resulting bottleneck can be bridged by funds sponsored by CVC providers. The higher level of equity given by the CVC investors allows ventures to borrow cheaper capital with less effort.<sup>58</sup>

Besides financial resources, ventures also receive non-pecuniary support: A corporation can significantly influence the venture in their strategic direction due to its shareholdings, support management, and fill in skill gaps in product development, sales, and marketing activities. If the venture occurs in a comparable sales market like the corporation, the corporation can gauge the chances of the product and estimate the growth potential with the associated risk more safely than a completely different sales market. Corporation may also provide access to distribution channels for the venture's goods or services. Furthermore, the start-up can benefit from greater recognition and credibility on the market. Another aspect is the support in legal matters, for example protection of copyrights.<sup>59</sup>

### **2.2.3 Motives from the perspective of established companies**

In literature exist diverse opinions on what exactly the motives of established companies are, when it comes to venture investments. In summary, however, the following points can be mentioned:

By investing in a venture, corporations hope to gain access to new technologies that will create novel products and open up future markets. Corporations can cheaply gain insight into new business areas outside of its previous core competencies. From a strategic perspective, the incumbent can directly monitor the technology development of the start-up and drive disruptive innovation through the start-up.<sup>60</sup>

The aim of the innovation is to improve one's competitive position by creating a competitive advantage or catching up on a technological backlog.<sup>61</sup> The internalization and control of technology also makes it possible to keep the competition of the corporation

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<sup>57</sup> Schrottke (2005), p. 95.

<sup>58</sup> Schween (1996), p. 90.

<sup>59</sup> Henley (2005), p. 3; McNally (1997), p. 55; Eckstaller, Huber-Jahn (2005), p. 13.

<sup>60</sup> Schrottke (2005), p. 5.

<sup>61</sup> Henley (2005), p. 3 ff.

away from technological development. Furthermore, new relationships with independent VCs can be established.<sup>62</sup>

The existing R&D department is primarily concerned with the further development of existing product ranges or takes care of academic topics with low operational relevance.<sup>63</sup> According to Gompers (2002), internal R&D departments are therefore inefficient. This is justified by the fact that internal resistance hampers the conversion of the obtained new insights into marketable products. This in-house opposition is created by managers who want to prevent in-house competition of their products.<sup>64</sup> The study by Ernst & Young (2008) comes to a similar conclusion, according to which there is an increasing recognition among large companies that an in-house R&D department is insufficient to sustainably survive in international markets.<sup>65</sup> Young companies can thus develop innovative products more efficiently than corporation. Therefore, access to external innovation is crucial. In this context, CVC plays a key role in increasing future corporate growth.

As corporations also want to gain insights into new technologies, not only financial goals play a role. This is causing VC financiers to call in CVC providers only in later rounds of financing if larger investments become necessary. The company valuations of start-ups are often high (or even overvalued) in these rounds of financing, which makes it difficult to achieve the required returns. Many corporations therefore came to the conclusion that the achievement of strategic goals excludes an adequate return.<sup>66</sup> Both VC and CVC exposures are generally only for a limited but variable period of time. At a certain point in time, the financier will terminate the cooperation. There are several options for this: In addition to an IPO, there is one-trade sale or a buy-back by the company founders. In case of failed start-up companies, a liquidation or complete write-off is required. Last but not least, the corporation can fully acquire a successful start-up and thereby open up an exit channel for the co-investors.<sup>67</sup>

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<sup>62</sup> Henley (2005), p. 3 ff.; Ernst & Young (2008), p. 6

<sup>63</sup> Henley (2005), p. 3 ff.

<sup>64</sup> Gompers (2002), p. 1.


<sup>65</sup> Ernst & Young (2008), p. 1.

<sup>66</sup> Roberts (1980), p. 135.

<sup>67</sup> Finke (2003), p. 15 f.

Various studies have analyzed the weighting of strategic and financial goals. The results differ considerably:

Studies



Goal	Schween (1996)	Weber & Weber (2002)	Mackewicz & Partners (2003)
Primary strategic orientation	83%	42%	49%
Strategic and financial orientation	17%	37%	21%
Primary financial orientation	0%	21%	30%

Source: Erni (2008) p. 11

**Table 2: Comparison of studies focused on CVC**

In general, however, it can be concluded that strategic orientation is the primary goal for established companies. The financial orientation seems to be of secondary importance for them.

#### 2.2.4 Motives for public support

Besides private and institutional investors, public sector bodies also provide financial resources to start-ups and provide also other basket of services in this context. The motive behind this support is the frequently cited positive economic effects ascribed to start-ups and technological innovations. These include the creation of skilled jobs and positioning in growing industries. Young companies primarily promote structural change and create more new-style jobs than established companies. Start-ups are significantly responsible for creating future economic growth and jobs.<sup>68</sup> Companies can compete in the future only through the consistent pursuit of an innovation strategy.

As a result, technological advances are major pillar in international competition. Technology is constantly improving through innovation, which in growth theory serves as the foundation for sustainable economic growth.

In the growth model of Solow and Swan (1956), only technological progress is important for sustainable growth. As a result, companies as well as growth policy can only be

<sup>68</sup>Duffner (2005), p. 15 f.



successful if technological progress is constantly supported.<sup>69</sup> Following this argument, the state should actively support market access of technological innovators, innovative processes and eliminate any trade barriers.<sup>70</sup>

## **2.3 Current state of research on Corporate Venture Capital**

Following the overview chapter above, CVC research is deeper discussed below. CVC has a manageable but increasing over time body of analysis in the literature, primarily based on US data. In general, only empirical studies and theoretical work on CVC are available. The scope of analyzes on the European market is very modest and the contribution of academics to the CVC literature is very limited.

In order to form a basis for the preparation of the research question, in a first step, the existing thematically relevant literature will be reviewed and critical aspects addressed. In a second step, the existing empirical research on the European CVC financing market for start-up companies will be discussed. From the results of these two subchapters, the existing research gaps are finally worked out, which are needed for the preparation of the hypotheses in the empirical investigation.

In the following subchapters, a distinction is made between the two research fields "performance measurement and its relevant success factors" and "recommendations for setting up and implementing CVC without measuring performance". The following overview of literature excludes analyzes that are based on individual case studies. The literature on the organizational design and optimization of the innovation process and the associated complex relationship between the investor and the capital recipient will not be discussed in more detail below.

### **2.3.1 Performance measurement and relevant explanatory factors**

In literature, there is basically inconsistency in measuring success of CV activities. Since the various objectives are not just financial, measurement problems occur. Depending on the study, the assessment of strategic goals varies.

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<sup>69</sup> Solow, Swan (1956), cited in Banik (2004).

<sup>70</sup> Parente, Prescott (2000), p. 133–144; As prime examples are the USA, Switzerland and Hong Kong.

For start-up companies, the application of key performance indicators of established companies reaches its limits. According to a broad literature analysis by Schefczyk (2004), several groups of success measures are used in young companies:<sup>71</sup>

- Market success indicators such as market shares and their changes.
- Growth measures such as revenue and employment rate.
- Stake rentability measures such as the return from the perspective of the investor or Internal Rate of Return (IRR).
- Composed measures such as market-to-book value ratio.
- Subjective criteria of success, such as the assessment of the achievement degree of a goal.

Gompers examined in 1998 a total of 32364 VC investments, which were made in the years 1983 to 1994. He distinguishes in his investigation between CVC and VC. Gompers draws the following conclusion from his analysis: The likelihood of an initial public offering or a sell of a CVC-funded start-up is significantly higher than for VC-backed companies, provided that the start-up has the same strategic focus as the CVC provider. However, it was not evident a distinguishably higher return on CVC financing than VC financing. On the other hand, many corporations realized significant losses in start-up companies whose sales markets were unrelated to the sales markets of the CVC provider.<sup>72</sup> In addition, it was also shown that Corporate Venture Capital investments were partially ineffective, as corporations did not really understand how to implement the innovative ideas on the market successfully.<sup>73</sup>

Overall, CVC providers' investments are more successful than those of independent venture capitalists, as long as the venture operates in related industries. The author concludes that this is a congruence of the strategic orientation of venture and corporation. His analysis shows that CVC is more successful than VC if the company finances start-up companies whose strategic alignment coincides with that of the corporation. In contrast, the financing of start-ups whose strategic orientation is incongruent has a lower

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<sup>71</sup> Schefczyk (2004), p. 182 f.

<sup>72</sup> Gompers (2002), p. 10 ff.

<sup>73</sup> Ibid., p. 1.

success rate. In addition, US corporations appear to have adopted VC's most successful practices, which shows higher rates of success with the course of time.

Gompers also noted a tendency that CVC providers participate in late and larger rounds of financing, which is also reflected in the slightly higher age of start-ups at the time of funding. The earlier a financing is made, the sooner the sales markets of start-ups and investors will become congruent.<sup>74</sup>

Gompers also notes that some of the strategic goals outweigh financial considerations. This results in a certain price insensitivity, which is exploited by independent VC funds. This gives the impression that corporations cannot simultaneously pursue strategic and financial goals.<sup>75</sup>

Usually, CVC providers will only enter a late-stage round of financing if the start-up needs a bigger portion of funding. Gompers concludes that the success of start-up financing depends on the extent to which the strategy of CVC providers and borrowers overlap. In order to reduce failures, the objectives to be pursued by the start-up should be very-well defined and the company should be able to clearly isolate its benefits from an investment.<sup>76</sup>

Dushnitsky and Lenox (2006) came to a similar conclusion. They compared both strategically and financially oriented CVCs<sup>77</sup> (although as mentioned earlier in the chapters CVC is by definition strategic investment). Their data base includes 171 American companies, of which 64 percent indicated strategic and 36 percent exclusively financial motives. Tobin's Q was used as a dependent variable. The exogenous variable CVC corresponds to the annual investments that have been made. The authors found that companies with a CVC program show a higher Tobin's Q than companies without a corresponding program. They attribute this result to overcompensating the strategic drawbacks of in-house conflicts and off-target goals with the strategic benefits of seeing new technologies and practices.

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<sup>74</sup> Gompers (2002), p. 3 ff.

<sup>75</sup> Ibid., p. 2, 9 and 11.

<sup>76</sup> Ibid.

<sup>77</sup> Dushnitsky, Lenox (2006), p. 769.

CVC investors may also have specific expertise that allows them to make better selection of start-ups than CVC investors with a purely financial strategy. The strategic support also increases the likelihood of successful start-ups.<sup>78</sup>

According to Dollinger (2003), internal ventures are limited to the budget assigned by the corporation, but the likelihood of financing is higher than for external ventures. An independent management often lacks the motivation to let the corporation invest in early stages of start-up companies.<sup>79</sup>

According to Roberts (1980) a few ventures are successful. And successful ventures often take more than a decade to complete the investments and management support they have made. The central challenges are that the company wants to build new technologies and organizational structures for a venture in barely known markets.<sup>80</sup>

Fast and Pratt (1981) come to the conclusion that ventures are more successful when are established outside a corporation than within a large corporation.<sup>81</sup>

Starr and MacMillan (1990) conclude from their research that internal corporate ventures on average take twice as long as external ventures to reach breakeven and are only half as profitable. The authors attribute this to the behavior of the fund manager: The independent venture manager receives less financial remuneration for his actions and invests along more own funds than the internal venture manager, who often gets a monthly salary like a regular employee. The manager of an internal CVC also has to consider the broader strategy of the corporation in its deliberations and to maintain the active exchange of ideas. Many internal CVCs also carry the imputed costs of a company. Internal and external venture funds are also different in terms of resource endowment: while external ventures tend to be founded by people with higher education in engineering and high level of technical experience, managers of internal CVCs work on a higher management level, and are usually trained to be business leaders. However, the latter do not usually have an up-to-date technical knowledge.<sup>82</sup>

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<sup>78</sup> Dushnitsky, Lenox (2006), p. 757 ff.

<sup>79</sup> Dollinger (2003), p. 211 ff.

<sup>80</sup> Roberts (1980), p. 134.

<sup>81</sup> Fast, Pratt (1981) and Weiss (1981), cited in Henley (2005), p. 1 f.

<sup>82</sup> Starr, MacMillan (1990), p. 84 ff.

Schefczyk (1999) found in his study that the success of start-ups is positively influenced if the VC provider enters into a minority stake and at the same time provides debt capital.<sup>83</sup> This financing strategy is a partial reflection of the nature of mezzanine capital, and thus coincides with the theoretical considerations of other academic papers.

Siegel, Siegel and MacMillan (1988) conducted a quantitative investigation that shows that independently managed CVC units are more successful than comparable entities that have close organizational ties to the parent company. In a survey among CVC funds participants should have rated different goals according to their importance. It turned out that the financial goals are dominated by insights into new technologies, the development of new products or processes, and finding possible takeovers.<sup>84</sup> Only 24 percent of the participating CVC units responded that their wages were linked to the success of the CVC unit.

The authors conclude from their study that CVC funds should be run as organizationally separate units with an independent budget. The unit leaders should have proven entrepreneurial experience and be remunerated in a similar way to independent VC funds. The authors argue that financial goals should be pursued primarily and thus the strategic orientation towards technical innovations should be secondary.<sup>85</sup> Finally, Schefczyk (2004) points out that the performance-related remuneration of VC funds generates better motivation than CVC companies have.<sup>86</sup>

### **2.3.2 Recommendations for setting up and implementing CVC without measuring performance**

Various studies focus their analyses on the subject of recommendations for the construction and implementation of CVCs without success measurements. Henley (2005) noted that US ventures that have a high strategic overlap with their lender are being funded as often as start-ups whose strategy is marginally in line with that of the corporation. Henley interviewed a total of 89 start-up companies in 15 industries in 2000 and 2001, and also conducted interviews with relevant people. He concludes that even start-ups without strategic congruence with the corporation are used for an insight into new

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<sup>83</sup> Schefczyk (1999), p. 1127 ff., cited in Finke (2003), p. 13.

<sup>84</sup> Siegel, Siegel, MacMillan (1998), p. 236.

<sup>85</sup> Ibid., p. 233 f.

<sup>86</sup> Schefczyk (2004) p. 216 f. and p. 290; Neubecker (2006), p. 170.

technologies. According to Henley, CVC investors should not invest in start-ups to realize a quick profit. Unlike VC funds, corporations should always make their investments in ventures in terms of business expansion, acquisition, and skill building. However, through a minority stake in a start-up, the CVC investor can assert its influence on the board of directors can provide fewer funds and has more strategic flexibility<sup>87</sup> than majority ownership. Should the start-up company fail, the realized loss, time costs and coordination effort are smaller. With the transition of formal control through a majority stake, the entrepreneurial creativity is weakened, which runs counter to the interest of the corporation.<sup>88</sup> Furthermore, the corporation has more bargaining power.<sup>89</sup>

Henley argues that start-up companies can be viewed as real options: the corporation has the opportunity, but not the obligation, to make further financings. As time progresses and uncertainties in technology and market development go on, further investments are made which are not immediately profitable but have potential. CVC programs usually fail when only financial goals are pursued and not strategic ones.<sup>90</sup>

According to Bleicher and Paul (1987), companies lack the flexibility to quickly turn innovative ideas into marketable products. As a result, the corporations miss new, additional growth and financial income.<sup>91</sup> Small businesses' R&D spending is four times more efficient<sup>92</sup> than those spent by corporations. From 1953 to 1968, the majority of innovations in the US came from companies with fewer than 1,000 employees.<sup>93</sup>

Bleicher and Paul (1987) state that CV internal funds have hardly been successful so far. The authors attribute the general failure of this structure to several reasons:

- Coordination problems between the independently thinking internal ventures and the strategic objectives of the corporate. Informal, flexible and entrepreneurial ventures meet a bureaucratically organized corporate.
- Inadequate remuneration for the management of the venture. As a consequence, there is a lack of qualified personnel.

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<sup>87</sup> Henley does not elaborate on the aforementioned strategic flexibility.

<sup>88</sup> Henley (2005), p. 3 f.

<sup>89</sup> Harrigan (1983), cited in Henley (2005), p. 5.

<sup>90</sup> Henley (2005), p. 3 ff.

<sup>91</sup> Bleicher, Paul (1987), p. 64.

<sup>92</sup> Unfortunately, the source does not elaborate further on the phrase "four times more efficient".

<sup>93</sup> Foster (1986), cited in Bleicher, Paul (1987), p. 64.

- The CVC unit is not supplied with funds in advance, but must first submit all investment proposals to a committee. The financial situation and in particular the liquidity situation can therefore impair the venture's ability to act. Furthermore, the approval channels can also hinder the search for co-investors.
- Frequent change of strategy, e.g. due to a management change in corporation. In particular, the change between strategic and financial goals should be mentioned here.

Bleicher and Paul (1987) provide some basic rules for successful CVC in cooperation with external VC companies. Unfortunately, the authors remain on a rather superficial level. The most important element besides entrepreneurial personnel is the support by the top management and their awareness of the risks, the duration and the costs. Thus, the time frame is to be set relatively long, since the successes only become apparent after a longer time. A time horizon of seven to ten years seems appropriate. Financial targets should be given priority, since an appropriate return can secure long-term support of the corporation. If an external VC company is involved, it should be selected on the basis of the realized financial returns, the strategic benefits and the experience in the favored industries. In principle, a clearly defined investment plan should be available that reflects the investment strategy and can be adjusted if necessary in the event of a change in strategy. Furthermore, the corporate should not make the investment decisions, but should only define the framework conditions in order to avoid the problems of bureaucracy and long decision-making paths as far as possible.<sup>94</sup>

For its investigation, Sykes (1990) sent a questionnaire to a total of 86 corporations, of which 31 provided usable data. The survey was aimed at those departments that financed external start-up companies for strategic reasons. Internal CVC units and investments for purely financial reasons were not taken into account.<sup>95</sup> Participants were asked to estimate the strategic value of the investment for their corporation on a scale. Based on the results, Sykes (1990) suggests that investing in young companies with the aim of enabling them to develop their innovation. The corporation should also have a

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<sup>94</sup> Bleicher, Paul (1987), p. 68 f.

<sup>95</sup> Sykes (1990), p. 39.

relationship with the young company that benefits both and supports it in marketing, for example. In return, the corporation receives insight into new technologies.<sup>96</sup>

Melberg, Fast (1980), Klein (1987) and Rind (1981) recommend corporations to involve into CVC investments in start-up companies in order to gain knowledge and dive into their new technologies.<sup>97</sup>

According to Davidsson and Honig (2003), the social network is one of the decisive factors for the success of a venture. That is why young companies should also build and maintain good relationships with other companies. On the other hand, the training of management does not necessarily seem to be a key success factor for a young company. However, training courses in the field of corporate management and experience from other, previously managed start-up companies are helpful.<sup>98</sup> The manager of internal ventures has extensive knowledge about the capabilities of the corporation, its successful strategies, its internal and external network and how to deal with the sales markets.<sup>99</sup> However, it should be noted here that these advantages can be passed on in the case of external ventures by having a corporation's representative in the board of directors. In addition, it is unlikely that external investors will invest in companies whose sales markets are completely unknown to them and where they lack business contacts.

Neubecker (2006) examined in an empirical study what expectations young companies have of their respective investors. His data set consists of a total of 30 young companies financed with CVC and 45 with VC. To answer his question, he developed a total of 16 hypotheses. In the context of this paper, his 14th hypothesis is of particular importance. The author examines whether VC-financed start-up companies achieve significantly higher success than companies financed with CVC. He comes to the conclusion that his 14th hypothesis is not rejected and that, consequently, an identically expected success effect can be assumed.<sup>100</sup>

Ernst & Young (2008) published a study in 2008 with the aim of establishing a specific benchmark in the field of CVC. For this purpose, the programme structures of CVC

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<sup>96</sup> Sykes (1990), p. 47.

<sup>97</sup> Melberg, Fast (1980) and Klein (1987), cited in Sykes (1990), p. 38.

<sup>98</sup> Davidsson, Honig (2003), p. 3 and p. 16.

<sup>99</sup> Burgelman (1984), p. 158.

<sup>100</sup> Neubecker (2006), p. 170.



“donors“, the objectives, the organization of cooperation between the financed and financing companies and other financed companies as well as the investment practices were examined.<sup>101</sup> The survey carried out in Western Europe, North America and China covered CVC's department in 17 industries and 8 countries.

A quarter of CVC recipients report to the CFO, which supports the financial focus. Another quarter report to the head of the technology or IT department, which accentuates the innovation perspective of young companies. Slightly more than 20 percent report to the Corporate Development Officer. According to Ernst & Young (2008), this points to the detection of acquisition candidates.<sup>102</sup>

VC is geared only to the realized return, whereas CVC is also intended to achieve strategic goals. Only one in 37 CVCs replied that only financial goals are pursued. 17 percent primarily pursue strategic goals, while 80 percent pursue both strategic and financial goals.

The achievement of strategic objectives is difficult to measure, which is reflected not least in the range of assessment criteria used in the CVC sector. More than 90 percent of the CVC “donors” measure financial returns, more than half based on individual investments. Strategic performance is measured by several parameters: the number of financing transactions reviewed or completed (50 percent each) and the added value for other business units of the parent company (55 percent).<sup>103</sup>

86 percent of all CVC investments are made directly in start-up companies and not through another fund.<sup>104</sup> The advantages lie in the direct influence of the financial investor and the exchange of information between several companies within the portfolio. Indirect investments in funds are made when the CVC provider wishes to establish a relationship with VC funds or diversify the default risks in a larger portfolio.<sup>105</sup>

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<sup>101</sup> Ernst & Young (2008), p. 1.

<sup>102</sup> Ibid., p. 5 f.

<sup>103</sup> Ibid., p. 7.

<sup>104</sup> These are the so-called indirect investments - an example is the DB1 Ventures's investment into Illuminate Financial Management LLP. Basically, what DB1 Ventures does is delegating its job to somebody else, the way they present it though is risk mitigation and risk reduction.

<sup>105</sup> Ernst & Young (2008), p. 8 f.

Most financing opportunities (deal flows) come from VC recommendations. Internal recommendations and enquiries for specific companies come second, followed by recommendations from academic institutions.<sup>106</sup>

New ideas can come from innovation networks - loose connections of individuals and organizations outside the company - which can form an extension of the company, solve problems and generate new growth ideas. A CVC unit is an example of such access to innovation and could be an anchor in an innovation network.

As an exit strategy for CVC, the survey participants foresee the following options: 56 percent of the companies will be sold to a third party, 15 percent will be acquired by the parent company. IPOs were observed in 12 percent of the cases, while another 12 percent represented total failures.<sup>107</sup>

In the study by Ernst & Young (2008), only CVC funds were analyzed; investments from individual business units in start-up companies were unfortunately not taken into account.

Ernst & Young show that CVC-financed companies have a 72 percent higher median in the valuation before an IPO than young companies financed with VC.<sup>108</sup> There are some aspects that could be added to the discussion about the study by Ernst & Young (2008) and are discussed below.

Only a few of the participating CVC funds come from Europe, the vast majority is from the USA. Due to the different financial systems and the different stage of VC development between the USA and continental Europe the results can only be transferred to Europe to a limited extent.

The authors describe the surcharge of CVC-backed start-up companies in the run-up to an IPO as a premium and argue that the strategic focus and financial backing of the CVC provider could be responsible for this.<sup>109</sup> The authors themselves assume that this "premium" could at least partially be explained by higher financial contributions. However, the assumed premium may also be related to the fact that CVC investors often

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<sup>106</sup> Ernst & Young (2008), p. 9.

<sup>107</sup> Ibid.

<sup>108</sup> Ibid., p. 23.

<sup>109</sup> However, the exact calculation of the premium could not be understood.

provide funds together with other parties (co-investors). The majority of CVC donors invest together with other investors, while VC ones are usually solo players.<sup>110</sup>

As a final point of discussion, the possibility of different financing durations was not further investigated. Due to the strategic orientation of CVC donors, the financial commitment of young entrepreneurs can last longer than that of companies financed with VC. The premium discussed could thus also be partly explained by the longer duration of the financing.

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<sup>110</sup> Mohamed, Schwienbacher (2016), p. 73.

### 3. Hypothesis development

The following chapter is devoted to the presentation and reasoning behind the analyzed hypotheses. The selection of relevant hypotheses plays an integral role for forming a meaningful work. The author tries to embrace important factors that might contribute to the successful development of CVC investments and in particular the development of the CVC recipients.

As described in broader details in chapter 2, the findings of the previous research suggest that strategic overlap and existence of complementarities between the young company on the one hand and the parent of CVC entity on the other hand is one of the best recipes for successful investment development. One of the most obvious complementarities is the cases when the start-up company and incumbent operate in the same industry. As the vast majority of the previous research analyzed the continent of North America, it would not be accurate enough if we simply assume that the following patterns work the same way for Europe as well. Based on that logic the very first hypothesis is formulated as follows below:

*Hypothesis 1: The activity congruity between the CVC provider and CVC recipient is positively related to the success of CVC investments.*

The activity congruity is defined as the overlap (coincidence) of the industry that both the incumbent's CVC unit and the start-up company operate in. This hypothesis examines whether the industry coincidence plays an integral role in the success of a specific investment. It is intuitive to think that there is a positive relation but this work will analyze it based on actual data of past deals. Further on data sampling will be explained in chapter 4.

Other academics have spent some time on analyzing the success of IVC-backed investments in the US and 13 European countries. Kräussl and Krause (2011) put some efforts into gathering a good enough sample which gives a good representation of the status in the target countries. Among a bunch of factors they look deeper into the age of the companies. In essence, they analyze if the relative maturity of a VC-recipient affects its likelihood to success. The procedure they undertake resembles quite closely the one

applied in this work. Kräussl and Krause (2011) consider successful exits as either IPO or M&A. Their results are that in period between 1985 and 1999 the success rate in the analyzed European countries for infant firms (including seed, start-up and early stage companies) is higher than that of mature firms. On the other hand for the period between 2000 and 2009 they observe relatively low success rate for infant firms in continental Europe. In the period after 2000 VC-backed mature firms are two times more successful than infant firms. The two academics lead the research towards understanding whether the stage at which the company receives funding reflects eventually in faster and more sustainable growth.<sup>111</sup> Raade and Machado (2011) focus on similar study. They, however, put Internal Rate of Return (IRR) into play and in particular the pooled average of it. Their conclusion in the end is that the success of the investment differs depending on the maturity of the recipient company. This raises the question whether all that is 1:1 applicable to CVC as well or not. This paper deals also with analyzing this question in the European context. The author is looking at the relationship between the success of CVC investment and the age of the young enterprise at the time it received its first CVC investor.<sup>112</sup>

*Hypothesis 2: There is a positive relation between the age of the CVC recipient and the success of CVC investments.*

The answer to this hypothesis will reveal useful information that could be of use to asset managers and VC funds. Raade and Machado (2008) also compare returns of early stage investments in Europe to the ones in the US and discover a considerable discrepancy. Actually, both academic groups Kräussl and Krause (2011) and Raade and Machado (2008) come to the conclusion that infant firms in Europe considerably underperform in comparison to their US counterparts. They find that in the period between 2003 and 2006 the average number of VC recipients in Europe is way lower than in the US, this difference is even more evident when it comes to early-stage companies. Another discovery of theirs is that the average deal size in the US and Europe does not coincide but

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<sup>111</sup> Kräussl, Krause (2011), p. 23 ff.

<sup>112</sup> Raade, Machado (2008), p. 15 ff.

differ substantially. The average US investment is 5.5 times greater compared to the deal sizes in Europe.<sup>113</sup>

Various studies put emphasize on the importance of the investment size and how strong or weak it is related to the business development of the recipient. Kräussl and Krause (2011) come up with the conclusion that in over the time horizon of 9 years (2000-2009) the high investment amounts contribute to the frequency of VC-backed companies going public.<sup>114</sup> Other academics, Dushnitsky and Lenox (2006), investigate the US market to determine the impact of CVC on the investing company and understanding whether the annual investment sum has a positive impact on the firm's Tobin's q. In a nutshell, Tobin's q means that the larger the amount of CVC investments the greater value creation for the investing firm. All that above, suggests that the size is relevant aspect to be considered. Early-stage company success is dependent on the sufficient capital injection.<sup>115</sup>

*Hypothesis 3: The success of CVC investments is positively related to the size of the investment.*

It is not only about size, the number of financing rounds has its part as well. Financing rounds are important measure of a staged investment structure and probability of investment success. Gompers (1995) analyzed a random sample of 794 VC-backed US companies and show that the companies which list on the stock exchange (considered one of the biggest successes in a company development) receive higher total financing sums and a greater number of rounds than other companies that do not even reach breakeven. This is because staging allows VC investors to exit in case they find out any adverse information about the future returns.<sup>116</sup> On these lines is based the hypothesis below:

*Hypothesis 4: The number of financing rounds in which the CVC recipient participated is positively related to the positive outcome of the CVC investment.*

As in many things in life having experience in specific area or knowledge is crucial if you want to succeed. Same applies to CVC. Many authors take exactly that into

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<sup>113</sup> Raade, Machado (2008), p. 17 ff.

<sup>114</sup> Kräussl, Krause (2011), p. 23 ff.

<sup>115</sup> Dushnitsky, Lenox (2006), p. 6 f.

<sup>116</sup> Gompers (1995), p. 1472 f.

account, they focus their research on the experience of the CVC investor. Academics like Hartmann-Wendels, Keienburg and Sievers (2010) analyze 336 German VC transactions over the time span of 15 years (1990-2005). Their conclusion is that investors with rich experience and knowledge, with longer investment track record perform better over time. The less experienced the investor is the higher is the risk of asymmetric information in financing growth.<sup>117</sup>

Hochberg, Ljungvist and Lu (2007) prove as well that experience and skills have their importance in venture investments. They take similar approach analyzing their US sample and look at the impact of the VC parent firm on the performance of VC investments. Experience, however, is not measured by number of years in which the firm operates but in the cumulated amount of money invested between the parent's establishment and the fund's creation. They investigate the experience of the fund's parent firm basically. Their conclusion is that funds with parent companies with bigger experience perform better and exit their portfolio companies more efficiently and profitably. Interesting observation the make is how likely a VC-backed company is to delist involuntarily within 3 years of its step on the stock exchange. It turns out that companies backed by more experienced VCs have a substantially lower delisting likelihood.<sup>118</sup>

Gompers, Kovner, Lerner and Scharfstein (2008) devote their expertise on analyzing the behavioral aspects of VC investing. They assess the way most experienced VC funds act during heat-ups, how is that in comparison to less experienced players and create a generally good overview of how experienced VC investors react to public market signals of investment opportunities. They prove empirically that longer and richer experience, in particular by those with deep expertise in a specific industry, demonstrate the highest responsiveness to public signals of investment opportunities.<sup>119</sup>

The conclusion of the paragraphs above is that experience is important for the success in venture investing. CVC investors differentiate from the IVC due to their access to industry insights and knowledge through experienced parents, as CVC entities are mostly established by big corporations. Here comes the next hypothesis that is to be analyzed within this work:

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<sup>117</sup> Hartmann-Wendels, Keienburg, Sievers (2010), p. 473 f.

<sup>118</sup> Hochberg, Ljungvist, Lu (2007), p. 832 f.

<sup>119</sup> Gompers, Kovner, Lerner, Scharfstein (2008), p. 3 f.

*Hypothesis 5: The experience of a CVC entity is positively related to the success of CVC investment.*

The basic law of supply and demand applies to the CVC business as well. How successful an investment is, is not only determined by the supply side but also by the demand side.<sup>120</sup> The way the author measures demand is by the so-called “Total Early-Stage Entrepreneurship Activity” (TEA). Every country has its unique level of entrepreneurship for each year. All the information is publicly available and can be found freely on the web. Kräussl and Krause (2011) prove that a higher level of national entrepreneurship activity is correlated with better functioning of the VC ecosystem. This is seen by the higher level of IPO listings, more and larger M&A deals for both start-up companies and mature VC-backed companies in the US as opposed to the European countries. Traditionally, the US market is more entrepreneurship-friendly and people over there exploit this ecosystem. European businessmen’s entrepreneurial spirit is falling behind due to the more conservative policy in the old continent. Seemingly easy question to answer is whether successful CVC-backed companies are dependent on the TEA level of the country they are located in or not. This is what will be hypothesized as next in this thesis:

*Hypothesis 6: Countries with higher TEA levels are characterized by more successful CVC investments.*

After analyzing the entrepreneurship activity in the respective European countries the author changes the focus and collects necessary information about the level of intellectual property protection. This is directly related to the innovativeness of the specific country. Several academics point out its relevance and how important external factors are for the intensity and effectiveness of CVC activities.

Dushnitsky and Lenox (2005) focus on the potential innovation benefits of CVC investments. What they come up with is that the increase of innovation depends on the inability of ventures to protect their intellectual property and know-how. When ventures find it difficult to protect their innovations and there is no well-developed country policy about it, CVC investments go slightly up. On the other hand, it’s not only general country policy but also venture’s responsibility to protect its innovations. By weak in-

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<sup>120</sup> Kräussl, Krause (2011), p. 27 f.



tellectual property regimes, a venture which is usually with quite limited resources, might not have the means to prohibit investors from „stealing” its knowledge. As in many cases ventures neglect the importance of knowledge protection, they postpone taking the decision to proactively look for ways to ensure its intellectual property. They find it too costly and prefer spend more on technology and product development rather than on “unnecessary” expenses. Long-established corporations on the other hand can without any problems fight lawsuits or undertake necessary actions to protect what belongs to them.<sup>121</sup>

Based on the evidence listed above this work hypothesizes that entrepreneurs in the countries with weaker patent protection systems, or also called intellectual property protection (IPP), should receive more CVC investments. The logic behind it is that by such low protection incumbents will find it easy to get access to whatever they look for in an investment and then exit “untouched”.

*Hypothesis 7: Countries with weaker intellectual property protection laws attract higher volume of CVC investors; The relation between the level of intellectual property protection and the success of CVC investments is positive.*

The last hypothesis which will be investigated in the present paper will be explained below. A group of authors analyzed the importance of the local network and if there is any relation between the distance between the VC investor and VC recipient. Some claim that the proximity might reduce the information asymmetry and agency issues between the two legal entities. The distance between the VC and the firm it invests in is also important because of monitoring aspects. Wuebker, Schulze and Kräussl (2015) find different pattern though and they claim that distant investments, as measured by exits (IPO or M&A), perform better than local investments.<sup>122</sup> Above-mentioned studies exclude CVC in their research which is quite the focus of this paper. The author expects to find a positive relation between the distance and the success of CVC investment.

*Hypothesis 8: The distance between the headquarters of the CVC investor and the headquarters of the CVC recipient are positively related to the success of CVC investments.*

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<sup>121</sup> Dushnitsky, Lenox (2005), p. 622 f.

<sup>122</sup> Wuebker, Schulze, Kräussl (2015), p.11 f.

The above-formulated hypotheses aim to give more clarity over the CVC industry and what the determinants behind CVC-backed investments are. Various papers by academics from all over the world have devoted time and resources to demystify similar hypotheses but mainly focused on VC. It is a matter of empirical calculations to check whether their findings apply only to VC-backed investments or they work same way with CVCs.

For a better overview of the presented hypotheses the table below shows all of them in a summarized form:

Hypothesis	Independent variable	Expected relation (outcome) to the dependent variable
H 1: The activity congruity between the CVC provider and CVC recipient is positively related to the success of CVC investments.	Activity congruity	Positive
H 2: There is a positive relation between the age of the CVC recipient and the success of CVC investments.	Age of the investee	Positive
H 3: The success of CVC investments is positively related to the size of the investment.	Size of the investment	Positive
H 4: The number of financing rounds in which the CVC recipient participated is positively related to the positive outcome of the CVC investment.	Number of financing rounds	Positive
H 5: The experience of a CVC entity is positively related to the success of CVC investment.	Experience of CVC	Positive
H 6: Countries with higher TEA levels are characterized by more successful CVC investments.	Entrepreneurship activity	Positive
H 7: Countries with weaker intellectual property protection laws attract higher volume of CVC investors; The relation between the level of intellectual property protection and the success of CVC investments is positive.	Intellectual property protection	Positive
H 8: The distance between the headquarters of the CVC investor and the headquarters of the CVC recipient are positively related to the success of CVC investments.	Distance between CVC fund and investee	Negative

Source: Own table

**Table 3: Hypothesis and variables overview and expected relations**

## 4. Data and research methodology

This thesis examines how a group of carefully selected independent variables is related to the success of CVC-backed companies. As such, it explores the relationships between the observed exits – defined as IPO, merger or acquisition and the variables.

In the following chapter the author presents the way the data is obtained, used methodologies and limitations. It describes, in detail, the steps taken to examine whether the information collected provides evidence that supports the proposed hypotheses. All data were obtained from trustful data engines combined with hand-collected information from the web to increase the accuracy of the data. This chapter will conclude with the specification of the statistical models used to test the hypotheses.

### 4.1 Data sampling

As announced in the title of this thesis the focus lies on Europe. The author created a unique sample primarily sourced from Pitchbook Data, Inc. This is a software as a service (SaaS) company that delivers data reports, research and technology covering private capital markets and in particular focused on private equity and venture capital.<sup>123</sup> Pitchbook was chosen as a major data base for various reasons, the top among them are:

- 1) Availability and access to the platform.
- 2) Accuracy of the data.
- 3) Broad functionality and criteria selection choices.

The inputs were augmented by additional data from Bloomberg Terminal and Thomson Reuters Eikon. Due to the large sample often many figures had to be double and triple checked to make sure the accuracy of the analysis. Since the sample is complex the data were supplemented by frequent searches on the web, retrieving data from the affected company's websites, analysing reports from independent consultancy firms such as PWC, E&Y and Grant Thornton and others. However, if any biased information is in the data bases the author does not take responsibility for that. Due to the sensitive nature

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<sup>123</sup> Pitchbook (2018), p. 1, accessed 02.12.2018

of the investments many firms are reluctant to publish information regarding their CVC activity. For instance, established companies may attempt to closely guard their strategy to enter a new market currently dominated by entrepreneurial firms and thus insist on secrecy regarding their investment plans. In some cases there is a natural time delay of publishing and uploading some news or deal-related data, which might cause some omission of relevant facts. Many CVCs do not even announce their investments on time but wait till the „right” time. The “right” time is different for every CVC entity due to the different strategies and goals. As companies follow different goals by publishing news it is difficult to not omit anything in the data.

Another aspect which is worth to be highlighted before going further is that the only type of readily available data is on CVC exits at the transactional level. Venture Economics and a number of other data providers that track VC investments capture investments where corporations co-invest alongside independent VC firms. Many of these data bases do not track deals when the corporation is the sole investor and interestingly they do not provide information on investments by corporations in VC funds. By stating all that the author wants to point out that relying on VC data bases would imply biased information.

The original research sample consists of 635 Corporate Venture Capital investors and 8974 Corporate Venture Capital-backed investees. A number of filters were applied to get to the relevant data and focus of this thesis necessary for the performance of the analysis. In the table below are listed all the filter criteria used while looking for data on Pitchbook.

Search criteria	Filter
Investor type	Corporate Venture Capital
Investor type additional option	Search for primary investor type only
Investor location	Europe
Investee location	Europe
Location type	Search HQ only
Deal date	From 1.1.1990 to 31.12.2014
Deal status	Complete only
Deal size option	Exclude deals without deal size
Investor status	Active and inactive

Source: own table

**Table 4: Search criteria applied on Pitchbook**

After filtering the data according to the criteria listed above the sample reduced to 107 CVC investors and 864 CVC-backed investees. Starting from that point a hand-selection process had begun. Although the data base provides invaluable insights from the CVC industry in quite a few cases the Pitchbook's classification does not correspond to the reality. That is why the author had gone through each company to verify whether the sample fulfills the criteria range of this research. It turned out that in many cases classic VCs have been mistakenly doomed to be CVCs. Among those that were wrongly classified were others for which was not available enough information to conclude regarding their identity-whether IVC or CVC, they were all excluded. After a series of clean-ups the number of purely CVC firms went down to 86. This sample is hand-filtered and verified by the author that 86 corporate-sponsored VC funds had invested in at least one company over the period of 24 years till 31.12.2014.

Following the paper by Chammanur et al. (2011) an entrepreneurial company is considered CVC-backed only if it has at least one CVC investor<sup>124</sup> present in the cap table.<sup>125</sup> Strategic investment, in this context, is defined as investment that is made with the purpose of achieving benefits beyond the financial appreciation of the equity held by financial corporations. Although this definition excludes VC investments made by financial

<sup>124</sup> Chemmanur et al. (2014), p. 2443.

<sup>125</sup> Capitalization table (or cap table) is a table, typically made for start-up companies, providing information about ownership stakes in a company. It aims at presenting all those entities and individuals who have ownership of a company in some form.

corporations, the author does not automatically exclude them but first checks whether they intend to contribute strategically or financially.

Keeping this in mind the broad sample the author obtained had to be scrutinized to ensure no biased results. The CVC-backed companies were slashed roughly by half and end up with no more than 471 entities. The companies are distributed across multiple industries, with the majority residing in high-tech, computer-related electronics & engineering and pharmaceuticals, life science & health.

## 4.2 Definition of variables

One of the most effective ways of measuring success when it comes to companies is undoubtedly from financial point of view-revenue and net income. Since previous academics have already analyzed the different paces of development for CVC and VC-backed companies and eventually what type of investment brings more value for the recipient, this thesis does not go deep into this matter. Inspired by well-known papers on CVC, such as by Shane and Stuart, 2002, Kräussl and Krause, 2011 and Park and Steensma, 2012 this author's work follows their definition of success – IPO, merger or acquisition. Following their approach, a binary variable is applied, which takes either value of 1-if success or value of 0-if otherwise.

For most companies going public is the corporate event which everybody is waiting for. Usually, it is associated with considerable change in company's operations and has a long-term impact on the company. In a research paper by Park and Steensma (2012) the authors claim that likewise IVC, CVC entities look for capital gains through the sale of venture equity at an exit event such as an Initial Public Offering or M&A.<sup>126</sup> As discussed in the previous chapters, to avoid potential downward bias in the empirical findings, the sample does not contain ventures that received their first CVC investor after December 31, 2104. The reason for that is that it is not likely that these investments have been already exited and three full years (given the period in which this thesis has been written) are deemed sufficient (lower bound) to exit an investment.

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<sup>126</sup> Park, Steensma (2012), p.13 f.

### 4.2.1 Independent variables

In statistics a variable is something one is trying to measure. In practice, it can be anything - objects, years, revenue, feelings, ideas etc. Usually there are two types of variable – independent and dependent variables. The independent variable is, as its name implies, a variable whose change is not affected by any other variable in the experiment. Either the experimenter changes it or it changes on its own. Time is a typical independent variable, there is nothing you can do to speed up or slow down time. On the other side is the dependent variable. The dependent variable is what changes as a result of the change of the independent variable. It is called dependent as its value depends on something else. In a nutshell, the independent variable is what you change, and the dependent variable is what changes because of that.

In this work the author defines eight different independent variables. The first is “congruity“. Behind it is meant the coincidence of industry that both the young venture and the incumbent of CVC entity are operating in. Big corporations usually operate in different industries and in markets spreading on multiple continents. Thus, the congruity is measured on the full description of the parent activities. However, the classification always takes into account the major industry/services area of the incumbent for better results of the analysis. It equals 1 if an investee and CVC parent operate in the same industry and 0 otherwise. Let us take DB1 Ventures (the CVC arm of Deutsche Börse) as an example. Deutsche Börse operates one of the biggest stock exchanges in the world, namely the Frankfurt Stock Exchange (FSE). The focus of DB1 Ventures is respectively, strategically close to its parent. This means target companies are new ventures specializing in the FinTech, RegTech, clearing and settlement services etc. It would be considered fully congruent if DB1 Ventures invests in a company which does that, i.e. the company LMRKTS. LMRKTS is a company which provides financial and operational risk mitigation services. It is fully adjacent to Deutsche Börse’s operations and strategically important, thus 100% congruent.

The second independent variable is „age“. It refers to the „age“ (in number of years) of the company that received CVC funding, at the time at which the first CVC investment was received. In other words, how many years after the company’s foundation the company received its first CVC investor.

The third independent variable is the “size of investment”. It will give us information whether an investment with three zeros at the end have the same “push” as investments with nine zeros at the end. Here is to be stated that the size of investment is measured by the total amount invested in the company (up today), as it is difficult (not publicly available) to get exact investment amounts for each CVC deal. Another point to highlight is that not the actual size of the investment is taken but its logarithmic value. The author uses the logarithm for the distribution of the data because the actual investment amounts are too large compared to the rest of the variables. This situation gives rise to outliers in the data. In order to get rid of possible outliers and to normalize the distribution of the data the logarithm of the investment size is taken into account. Currency should not affect the outcome of this analysis given the fact that most of the countries are within the euro zone, have some sort of peg with the euro or are stable valuable currencies close to the euro.

The next independent variable measures if the number of financing rounds that the venture received before December 31, 2014 is related to the success of the investment. It is defined as “rounds”. As shown in the previous chapter, this question but regarding VC has been already analyzed by number of academics, that is why it would be useful to investigate it for CVCs.

The fifth independent variable is considered the “experience” of the CVC entity. There are different ways of measuring experience such as through the total money invested, number of years on the market, number of companies invested etc. In this work, the total number of companies in which a CVC entity invested is considered the most appropriate approach.

Following the logic of Kräussl and Krause (2011) the next independent variable is the level of entrepreneurship in the country, measured by the publicly available platform – Global Entrepreneurship Monitor (GEM). This platform is a well-known and trusted resource with more than 20 years of data and trusted partner of many institutions like United Nations, World Economic Forum, World Bank etc. GEM measures (in percentage) the level of entrepreneurship in every country. In case data is not available for each year (which is the case) the closest available date is taken. Every input was obtained manually since there is low possibility of filtering and optimization. They define entre-



preneurship as percentage of the adult population aging between 18 and 64 who manage their own new business.<sup>127</sup> By new business is meant owning and managing a new business that is paying salaries, wages or any other sort of remuneration for more than 60 days but less than 3.5 years. As data is not available for years before the turn of the millennium all investments that have been done before that, the TEA percentage for 2000 is taken. This indicator will give a country-specific touch of the analysis following suit the example of Kräussl and Krause (2011).

What follows next is the seventh independent variable which is also country-specific – intellectual property protection (IPP). One of the ways to measure it is through the patent protection index. Well-known scientists have published it in 1997. Other academics upgraded it years later and extended it for a longer period. In 2008 Walter Park came up with updated index to 2005 and covers 122 countries.<sup>128</sup> The index is a combination of five separate scores for: coverage (innovations that are patentable); membership in international treaties; duration of protection; enforcement mechanisms; and restrictions. What this index intends to do is to indicate the strength of patent protection, not the quality of the patterns. It shows how respectable the protection is and if the rights are honored. The opposite will lead to a low level of protection which means the inventions will be easily stealable. The respective percentages for the European countries which are subject of this paper are taken and analyzed. The author of the paper, Park, gives three points in time 1995, 2000, 2005 and average numbers for the period 1960-1990. As the time span of this thesis is from January 1, 1990 to December 31, 2014 the author of this thesis decides to take the average numbers of the three given years provided with the paper by Park.

The last independent variable that is to be described is the air “distance” between a CVC entity and the investee. The proximity between the two parties plays its role in the entire investment process and with the above-mentioned variable the author is able to assess by how much is the distance relevant for the success of a CVC investment. By measuring the air distance (in km) it is not literally taken the exact address but rather just the city. In case the two parties reside in the same city, the distance between the two is considered 0 km, regardless if they are 5 km or 65 km apart within the city.

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<sup>127</sup> Global Entrepreneurship Monitor (2019), p 1., accessed 31.01.2019

<sup>128</sup> Park (2008), p.762 ff.

### 4.2.2 Dependent variable

The independent and dependent variables may be considered in terms of cause and effect. If the independent variable is changed, then an effect is seen in the dependent variable. The values of both variables may change in an experiment and are recorded. The difference is that the value of the independent variable is controlled by the experimenter, while the value of the dependent variable only changes in response to the independent variable.

As announced in the beginning of the thesis the aim of this paper is to find the relation between the pre-defined independent variables, describe above, and the success of CVC investments. The success of CVC investment plays the role of the dependent variable. Its outcome is dependent on the variables and what values they take, thus it gives a binary outcome (it takes on two values: 0 and 1). Here below is how a binary outcome dependent variable is defined:

$$y = \begin{cases} 0 & \text{if no} \\ 1 & \text{if yes} \end{cases}$$

Depending on the situation one sometimes may code it differently but the definition above is most typically seen in practice.

### 4.3 Logistic regression model

Given the dichotomous nature of the data the author turns his attention to models suitable for this type of analysis, namely the logistic (logit) regression. This model is appropriate when the response variable takes only one of two possible values, i.e. yes/no or success/failure, etc.

As hinted in the previous chapter we will deal with binary outcome models. Overall binary outcome models are among the most used in applied economics after the typical ordinary least squares (OLS) model, which takes the following form:

$$y = x'\beta + e$$

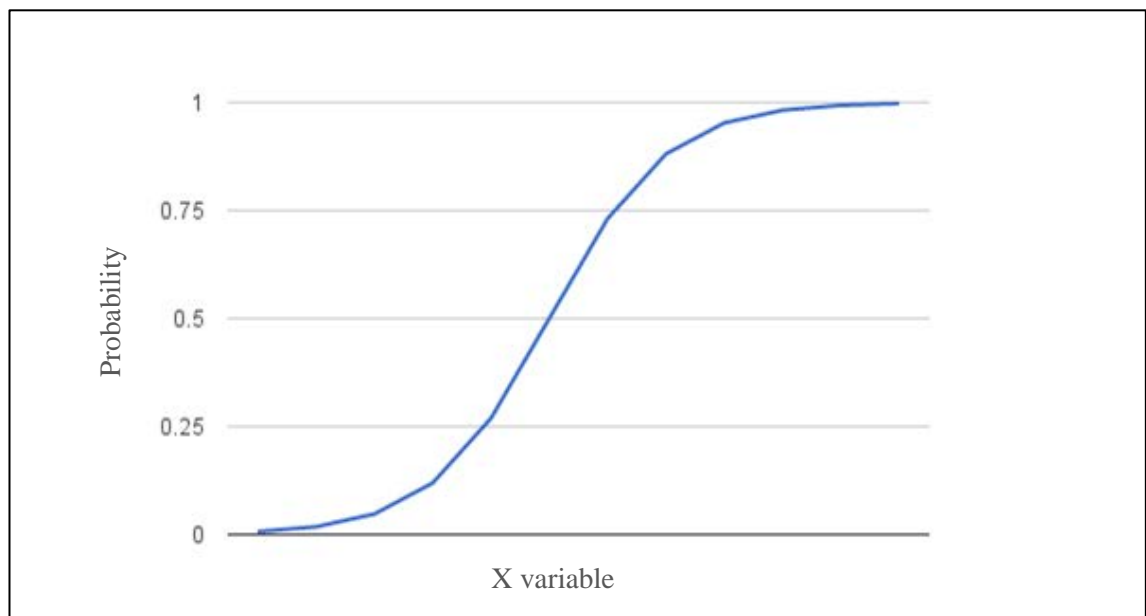
Binary outcome models estimate the probability that  $y = 1$  as function of independent variables. Instead of having continues variable  $y$  (as it is in the typical OLS model), the binary model would model the probability of  $y = 1$ . Put in a formula, this should look like this:

$$p = pr[y = 1|x] = F(x'\beta)$$

The reason OLS is not suitable for this analysis is that the predicted probability would not be between 0 and 1, but rather unlimited. The logit model is widely used in practice for such experiments. For the logit model,  $F(x'\beta)$  is the cumulative distribution function (CDF) of the logistic distribution:

$$F(x'\beta) = \Lambda(x'\beta) = \frac{e^{x'\beta}}{1+e^{x'\beta}} = \frac{\exp(e^{x'\beta})}{1+\exp(e^{x'\beta})}$$

The graph below demonstrates how a basic logit model looks like:



Source: own figure

**Figure 4: Sample logistic regression**

One can see that the function is somewhat similar to the linear model but it bypasses some of its limitations. It is monotonic and increasing for most of the range but at the two tails it begins to plateau. In mathematical literature this function is called Sigmoid function.

Speaking of logit regression it is worth mentioning the probit model. Both lie between 0 and 1 and both of them increase relatively quickly in the central portion and relatively slowly at the extremities. Unlike logit, the probit model arises when we use the inverse cumulative normal CDF as the link. Logistic model also has one more attractive property which is that the estimated coefficients can be interpreted as log-odds ratios. The probit model, however, does not lead to coefficients which have ready interpretations. To interpret the results of fitting a probit model one needs to look at the corresponding fits and their plots. Nevertheless, both models are very popular in the literature.

For probit model we would have the function  $F(x'\beta)$  which is the CDF of the standard normal distribution:

$$F(x'\beta) = \Phi(x'\beta) = \int_{-\infty}^{x'\beta} \phi(z) dz$$

Again in this case the predicted probabilities are limited between 0 and 1. As you can see these two models have two different functional forms but eventually if you use one or the other, the chances you get similar results are pretty high.

As this thesis applies only the logit model, probit model will be not discussed further.

## 5. Discussion of results

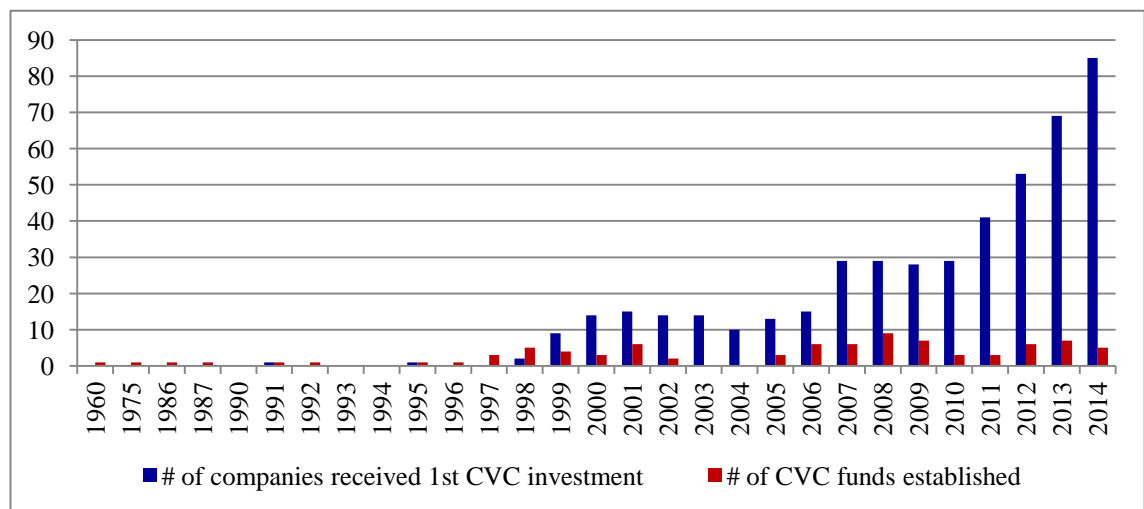
### 5.1 Industry characteristics and trends in CVC

Venture investing appears well on its way to establishing a firm foothold in the corporate world as companies look to nascent companies not to just generate some financial returns but also to complement their R&D efforts, enter fast-growing emerging markets, and gain early access to potentially disruptive technologies, know-how and business models. After a precise filtering of data and hand-picking relevant information the final sample contains of 471 CVC-backed companies and 86 CVC investors.

If we track the time back to 1960 up to 2014, one might see that for the first 40 years the CVC business was relatively “dead”. There was a wave around 2000 when many corporations established their first CVC entities to pursue strategic investments. This of course led to increase in the overall CVC deal number. One might remember that the period between 1991 and 2000 was characterized by strong stock-market growth (the so called dot-com era). On the US market for example, the CAGR for Standard & Poor's 500<sup>129</sup> from 1993 till 1999 was 21%. This wave “flew over” to Europe with some delay but had the same effect. This positive trend did not hold for long and around 2004 the optimism was tapped. Starting from that point around 2005-2006 we observe more or less sustainable growth with slight exceptions and downturns. For better understanding of the CVC cyclicity, the bar chart below illustrates its development in Europe:

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<sup>129</sup> Also known as S&P 500 is one of the most prominent US stock market indices which is based on the market capitalizations of the 500 largest US companies.



Source: own figure

**Figure 5: Number of companies received their 1<sup>st</sup> CVC compared to number of CVC funds established in Europe for the period 1960 to 2014**

The number of newly founded CVC entities in Europe and the number of new CVC-backed companies can serve as an indicator of the extent of the CVC popularity. Although there might be discrepancies between previous papers on similar topic all the data above represent what was generated from the data bases described in the chapters before.

Undoubtedly, the positive trend towards increasing the number of deals and respectively, the number of 1<sup>st</sup>-time CVC recipients is visible with the naked eye. After the first upward wave, followed another one starting from late 2005 till the financial crisis hit. Interestingly, there was no evidence of a CVC investment downturn but rather stagnation. This was followed by a strong upturn. Starting from 2011 till probably today the number of companies that received their first CVC investment has increased substantially. The jump in 2014 had increased three times since 2010.

An interesting fact that is not readable from the chart is that during the analyzed period a great majority, if not close to 90%, of the deals were made by a consortium of investors. In very few occasions is observable only one CVC investor. They usually find a bunch of other investors to invest side-by-side, usually IVCs. By doing so, they split their risk as more than one parties analyze the deal and the likelihood all parties get wrong assessment is low. A real-life example is again with the portfolio companies of DB1 Ventures, none of the companies in its portfolio have been invested alone, they

have always had co-investors. Two people are less likely to have wrong estimation than one person. Co-investors are either institutional investors, corporate investors or private investors and angels. Depending, of course, on the size of the deal the funnel of potential “co-players” decreases.

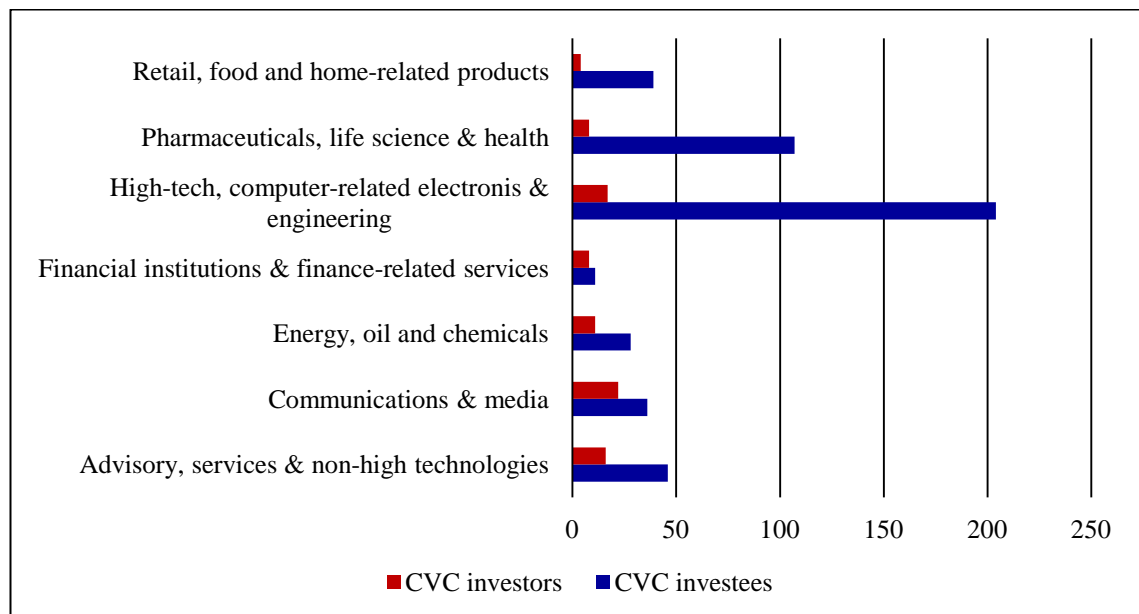
Similar to Kräussl and Krause (2011) all companies are classified into seven major industry groups, representing the major groups in Pitchbook. They are as follows:

- Advisory, services & non-high technologies.
- Communications & media.
- Energy, oil and chemicals.
- Financial institutions & finance-related services.
- High-tech, computer-related electronics & engineering.
- Pharmaceuticals, life science & health.
- Retail, food and home-related products.

On the investee side, high-tech, computer-related electronics & engineering is the industry group which exceeds by far the others. For the period in focus in total 204 investees received funding by one of another CVC provider, followed by pharmaceuticals, life science & health. The other sectors are more or less evenly distributed, led by the ventures from the advisory, services & non-high technologies. Overall five sectors are with less than 50 investees each.

On the investor side, the picture looks differently. It turns out that in Europe the biggest and most active CVC players are from the media industry. More than a quarter of the all investors belong to that industry. Interestingly, as it will be seen later, the German media sectors is the leader and invests aggressively. Deutsche Telekom Capital Partners, HV Holtzbrinck Ventures, Burda Digital Ventures are all names that are factors on that market.

One step behind is the group of high-tech, computer-related electronics & engineering and on the third place comes corporations from the advisory, services & non-high technologies area. The chart below gives a better representation on a bigger scale:



Source: own figure

**Figure 6: Distribution of CVC investors/investees according to their industry**

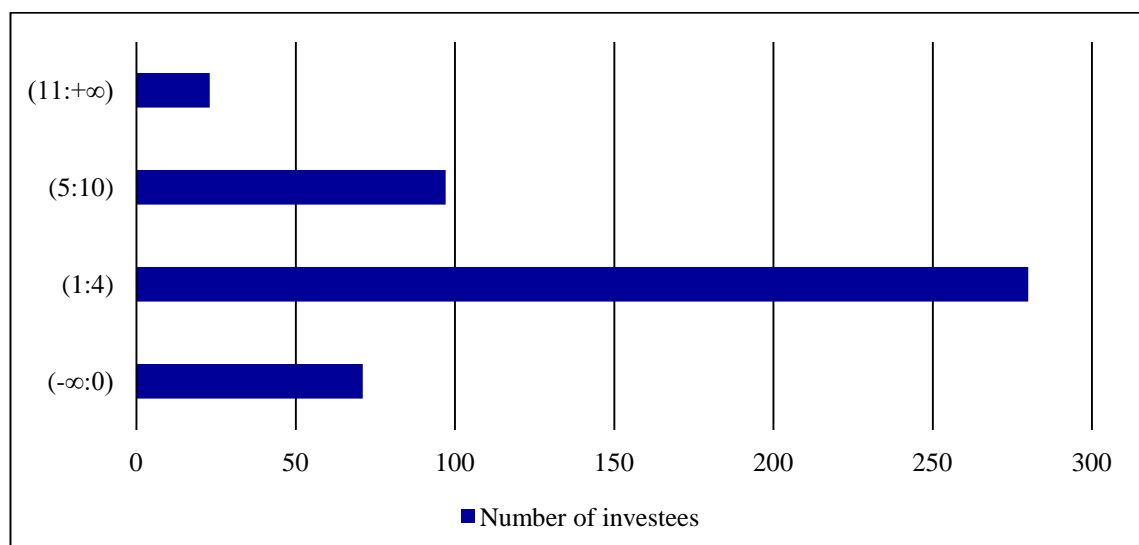
Computer-related services and semi-conductors focused CVC funds are dominant as well. Very active players are Volvo Group Venture Capital, Robert Bosch Venture Capital, Dassault Développement and others. The venture capital-orientation of the retail industry is sluggish. Anyway, no matter the fact that for example Tengelmann Ventures is from the retails industry, it demonstrates power and capacity to invest in various areas. Undoubtedly, the area of interest for no matter what the industry of the investors is, is the high-tech. As one can see on the table although retails do not have the highest number of investors it does have a reasonable number of investees-respectively, area is attractive. On the far end we can see almost parity between investors and investees in the financial world which is quite surprising given the recent boom of FinTech companies. The banking industry and CVC is very sensitive and sometimes academics avoid considering it as compatible. Some claim that by definition CVC excludes any investments by banks or financial institutions. That is why, the author's assumption is that a big chunk of the financial institutions are either not correctly represented in the data bases or classified into other sectors. There are some successful examples of financial institutions having CVC arms which operate actively. As other CVC funds they do not invest purely with the aim of achieving financial returns, they also have operations to optimize and improve, strategically relevant rather financially seducing.



Other aspect that is worth pointing out is the maturity of the companies that attracts most investors. In order to put some sort of clustering the author decides to group the ages in four representative groups:

- Group 1:  $(-\infty:0)$  years
- Group 2:  $(1:4)$  years
- Group 3:  $(5:10)$  years
- Group 4:  $(11:+\infty)$  years

It aims at presenting more clearly the desired profile of a company and what stage of development do CVC investors look into when thinking of where to allocate their cash. As this is all about ventures it would be out of logic to consider old companies with decades of years in history. The above-listed groups aim to cluster the “hottest” years in a start-up’s life cycle. One might wonder why there is a group which tracks the time before 0 and goes to minus infinity. The reason for that is that in not very few cases new disruptive players receive capital commitments by investors even before their actual venture establishment. Their idea could be so fascinating and innovative that angels and other investors are confident enough to deploy their capital without even seeing a working product or service. Such investments are surely accompanied by higher risk and uncertainties. Better breakdown of the exact groups is shown below:

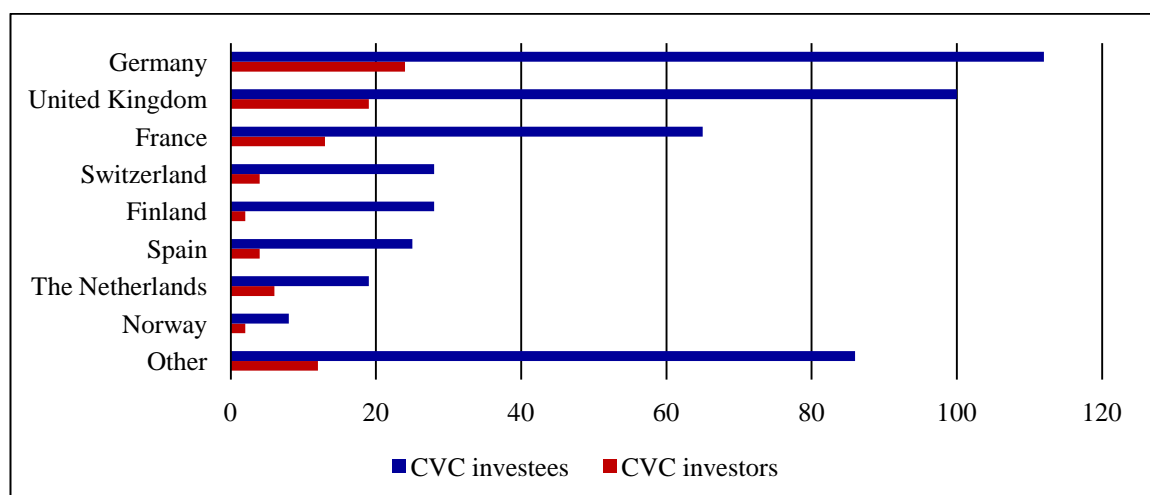


Source: own figure

**Figure 7: Number of investees per age of company**

The „age“ of the companies at the time they received their first CVC investment is calculated as the difference between the year when the company was founded and the year of the first CVC investment round. The exact months are neglected as they are in many cases not given. It is not surprising that ventures aging between 1 and 4 years attract most of the CVC investors (60% of the sample). In the second place are companies that received their first CVC investment after their 5<sup>th</sup> anniversary but before their 10<sup>th</sup>. This group is represented by 97 companies (21% of the sample). Interestingly, 71 companies received their first CVC funding even before they were actually founded. This reveals the risk affinity of the investors in the field and the proactive approach they have at looking into new unicorns. The rest 23 companies are distributed in the groups (11:+∞). It makes sense investors to avoid investing in such companies, first because they are not actual ventures any more, second the fact these companies have not attracted any strategic (CVC) investor so far means there is something worrying in there.

Is there any concentration of funds into a specific region or country? If so, why and where? The graph below intends to answer all these questions and similar ones:



Source: own figure

**Figure 8: Geographical distribution – CVC investors vs CVC investees**

Undoubtedly, the leader in Europe is Germany in both investors (24 firms) and investees (112 ventures). Close to 25% of all investees and near 30% of the investors are located in Germany. Reasons could vary but surely it is related to the stable and predictable economic policy the Western country has. All this means that investors have lower risk (lower uncertainty) when it comes to deploying their capital in the country. In the second place, regarding number of investees stands up the UK. The current candidate to

leave the EU is home of exactly 100 companies that received CVC investment over the period of 24 years. It might sound low but this is a statistically proven fact based on the data bases available. Although the UK is considered the financial hub of the EU apparently it is not fully truth. In the UK has registered 19 CVC investors invested over the considered period.

France, in turn, is lagging behind with only 65 CVC recipients and 13 investors. After these Western power nations line up Switzerland, Finland, Spain and so on but with lower deal sizes and investors.

Judging from the sample of European CVC-backed companies, there is a strong home bias among CVCs when choosing investees from the same continent<sup>130</sup> because more than 50-60% of the CVC-backed companies were located in the same country as their corporate investor. An easily noticeable pattern is that Eastern Europe is barely represented in the sample and although this analysis embraces the whole Europe, in practice when it comes to CVC whole Europe is almost equivalent to Western Europe. Surely, the economic situation and corruption levels in the East frighten investors and keep them aside.

European CVC investors are not very successful if only exits by IPO or M&A are considered to be a success, because only 39% of all the investments in the sample reached the “success mark”. The majority of the companies continue to operate but with a slower pace. Quite a fraction of the sample went bankrupt which is a not unusual outcome for ventures.

## 5.2 Descriptive statistics

Before turning to the results of the logit model it makes sense to make a quick descriptive statistics analysis of the results. It will help the readers to get a better idea of the basic features of the data in this study. All data was wrangled on R Studio Version 1.1.463. The overview is shown below:

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<sup>130</sup> Note that CVC investors located outside the continental Europe were eliminated and not considered in this analysis.

	Congru- ity	Age	Total invest- ment	Number of rounds	Experi- ence of CVC investor	TEA	IPP	Distance
Mean	0.643	3.705	21 522 789	2.473	49.028	5.981	4.437	392.966
Standard Error	0.022	0.306	3 091 901	0.091	2.713	0.081	0.010	18.586
Median	1.000	2.000	5 020 000	2.000	31.000	5.622	4.540	366.000
Mode	1.000	1.000	1 000 000	1.000	53.000	5.340	4.390	0.000
Standard Devia- tion	0.480	6.636	67 102 101	1.984	58.877	1.757	0.214	403.367
Sample Variance	0.230	44.043	Too big	3.935	3466.44 8	3.087	0.046	162 704.78
Kurtosis	-1.647	238.086	112.253	104.007	2.443	0.935	6.624	5.067
Skew- ness	-0.600	13.316	9.487	7.468	1.962	0.851	-2.333	1.677
Range	1.000	126.000	974 906 000	32.000	210.000	9.030	1.127	2941
Mini- mum	0.000	-1.000	14000	0.000	1.000	1.630	3.500	0.000
Maxi- mum	1.000	125.000	14000	32.000	211.000	10.660	4.627	2941

Source: own table

**Table 5: General descriptive statistics of the sample**

Let us start with a quick analysis. The first variable – “Congruity” shows whether the industry of the CVC investor coincides with the industry of the CVC recipient. Interestingly, the results indicate that the congruity of the sample is 64%. In other words, the conclusion is that more than half of the CVC investors (exactly 64%) invest in ventures that share the same industry area. Why is that, one might ask? It is logical if one investor is looking for a company to invest to look for those companies where he sees synergies with and where he has a deep knowledge of the matter. No knowledge equals more risk, respectively lower returns and synergies, which is what investors are trying to avoid.

The average “age” of CVC-backed companies is 3.47. As shown in figure 4, this fits to the group where most of the companies are in. The youngest venture in the sample is

minus 1 year and the oldest 23 years. The standard deviation of the “age” is relatively low which means the values are spread not that far below and above the mean. The mean total investment size in a CVC recipient is close to €2mln, minimum is €0.03mln and the maximum is close to 975mln.

Interestingly, the number of rounds before a venture receives its first CVC investment is surprisingly low-just 2 rounds a half on average. Of course, the minimum is 0 as some ventures received their monetary support before even publicly announced they open a funding round. On the other extreme there is a venture that finally got a CVC investor on the table after 32 rounds. This was the venture Volubill, a French company which provides real-time monitoring, control, and charging software to fixed, mobile, and convergent operators. The CVC investor was Deutsche Bank’s CVC arm – Deutsche Venture Capital (one of the few examples of successful CVC units in such a big financial institution).

It can be concluded that the average CVC investor has relatively high experience<sup>131</sup> as the average number of investees the CVC investor has invested in before the respective deal is 49. The most experienced investor is the CVC arm of the Italian IT system integrator Reply – Breed Reply. It is an investment fund with a huge portfolio and bright experience behind it. The focus of the fund lies in the Internet of Things (IoT) and is geographically agnostic.

Another interesting fact is that the majority of the deals were done in the same country as the investor is located in. The average distance between the headquarters of the CVC investor and the headquarters of the CVC recipient is 393km. Of course the minimum is 0, in the cases when both legal entities are located in the same city. The maximum distance on the other hand is 2 941km.

In the table below the author summarizes the average values of the independent variables (excluding the country specific variables) on year-to-year basis. Having this overview gives a nice understanding on how „busy“ was the respective year. The years in which none of the CVC-backed companies in the sample received their first investment are excluded on purpose.

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<sup>131</sup> Here is to point out that CVC’s experience could be gained not necessarily only through investments in Europe but from investing elsewhere.

Year	$\bar{x}$ Congruity	$\bar{x}$ Age	$\bar{x}$ Total investment	$\bar{x}$ Number of rounds	$\bar{x}$ Experience of CVC investor	Distance
1991	0	3	113 090 000	4	5	412
1995	1	0	5 000 000	3	53	374
1998	0.5	1	38 490 000	4.5	104.5	359
1999	0.7	2.3	21 298 888	2.6	30.9	191
2000	0.6	1.6	26 357 333	3.3	66.7	303
2001	0.7	2.1	25 681 333	2.9	98.5	394
2002	0.6	4.6	23 067 142	2.1	46.9	305
2003	0.6	3.1	13 047 428	2.9	29.5	279
2004	0.6	4.5	34 944 000	2.9	97	509
2005	0.7	4.5	64 035 384	4.4	62.3	363
2006	0.9	5.5	29 630 666	2.5	72.5	279
2007	0.8	4.7	17 143 793	2.6	47.6	501
2008	0.8	3.5	16 452 758	2.5	67.5	341
2009	0.6	3.3	19 233 214	3	40.8	345
2010	0.7	3.0	24 493 448	2.8	54.1	396
2011	0.7	2.9	17 652 439	2.4	45.9	250
2012	0.6	3.1	10 705 660	2.3	37.7	626
2013	0.7	5.2	31 461 884	2.0	45.7	453
2014	0.5	3.6	13 562 000	2.0	35.9	458

Source: own table

**Table 6: Descriptive statistics on a year-to-year basis**

Excluding the congruity result for 1995, as the sample is not big enough (just 1 deal), the highest congruity is observed, right before the subprime mortgage crisis, in 2006. On average 0.9 is the congruity level of all investments which is very close to concluding that all corporations, more or less, invested in ventures from their own industries. There is a slight tendency that over the year the congruity level goes up. Same tendency applies to the age of the ventures. The average age of the CVC investees had increased over the course of time although is difficult to observe any deeper pattern. It reached its peak in 2006 with 5.5 years on average. This number means that CVC investors waited on average 5.5 years until they invest in a venture. The lowest level is again in 1995. The total investment an investee received till 2014 is on average 20mln over the years

with two exceptions in 1991 and 2005. This is somehow misleading as the date of the first CVC investment the investee had lower capital injection but the €13mln is the total investment the company ever received before 2014 (which in fact includes its IPO).

Turning to the number of rounds, one may conclude that they do not fluctuate a lot but are relatively stable. The peaks are in 1998 and 2005 with 4.5 and 4.4 rounds on average, respectively. The tendency is that the number of rounds goes down. The average experience also varies, which shows that it is not the same CVC entities that make investments every year, as experience is defined as the number of companies the CVC arm have previously invested in. There is one striking number that might mislead the reader, this is for 1998 - 104.5 previously invested companies. This CVC arm (Deutsche Telekom Capital Partners) is indeed experienced but as there was a lack of information about the exact number of companies the CVC investor had each specific year, this 104.5 represents the number of companies the investor invested in as of December 31, 2014. Apart from that, the experience of the investors varies but rarely goes below 30 investments. The author already highlighted that investors tend to allocate their funds into companies which are located within the same country and even within the same municipality. In 1999 investors were with the “shortest horizons”. Every second investment, so to speak, was in a venture located closer than 191km. For better visualization, this is something like the distance between Milan and Genoa. Due to the globalization, probably at least partially, and the liberalization of the international trade, CVC investors expand their horizons and open their eyes for potential new unicorns farther from their home region.

In the table below is presented how the 8 independent variables are correlated between each other:

	<b>Con-gruity</b>	<b>Age</b>	<b>Total invest-ment (log)</b>	<b>Number of rounds</b>	<b>Experi-ence of CVC investor</b>	<b>TEA</b>	<b>IPP</b>	<b>Dis-tance</b>
<b>Congruity</b>	1							
<b>Age</b>	0.0397	1						
<b>Total in-vestment (log)</b>	0.0540	0.2069	1					
<b># of rounds</b>	0.0773	0.0404	0.4499	1				
<b>Experience of CVC investor</b>	0.1727	0.0159	0.2116	0.0932	1			
<b>TEA</b>	0.0240	0.0544	-0.0718	0.0052	0.0472	1		
<b>IPP</b>	-0.0678	0.0555	0.2135	0.1206	0.0303	0.0081	1	
<b>Distance</b>	0.0186	0.0092	0.1413	0.1181	0.0611	0.1336	0.0757	1

Source: own table

**Table 7: Correlation matrix between the independent variables**

The coefficient value is always between -1 and 1 and it measures both the strength and direction of the linear relationship between the variables. The closer to 1 the value lies the stronger is the relationship and vice versa. A coefficient that matches exactly 0 indicates that there is no linear relationship between the selected variables.

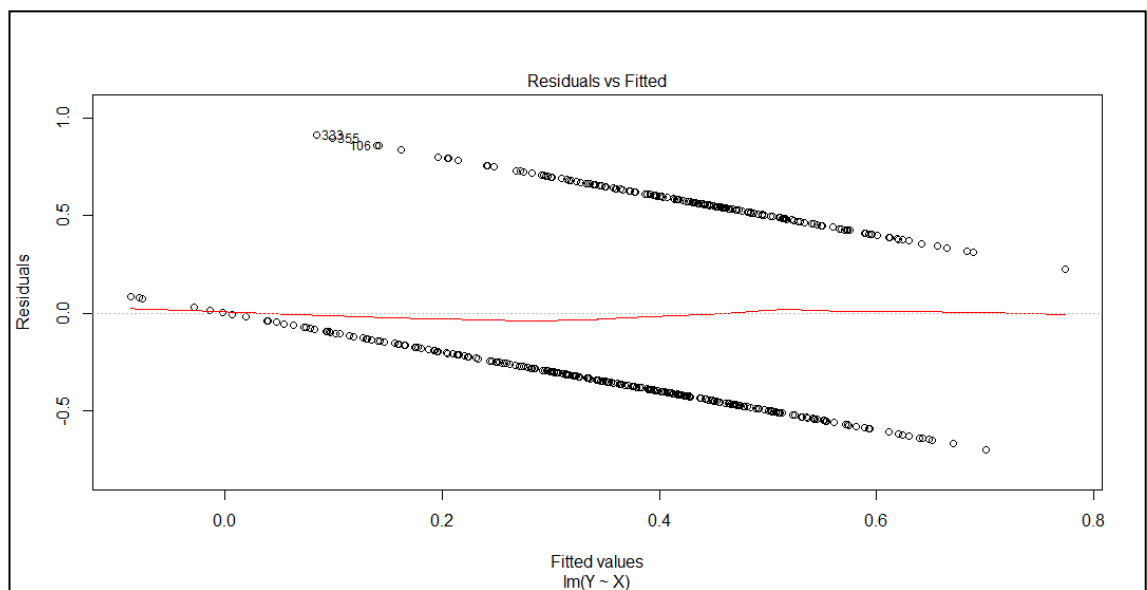
Among the above-analyzed coefficient one may conclude that they are both positive as well as negative values. Values that equal 0 are not present in the table. Predominantly, you can see positive signs, which signals more direct correlations than inverse ones. So as the majority of the variables increase the other variables increase proportionally. The highest correlation (0.45) is observed between the total investment amount and the number of financing rounds the venture participated in. In other words, as the number of rounds goes up, the total investment size increases. The second highest correlation coefficient is observed between the age and the total investment amount. The older or the more experienced the venture is (if even possible to mention any experience when talking about start-ups) the higher is the total investment amount it has received. As the correlation between total investment amount and the number of financing rounds is relatively high and it is worth mentioning that it could cause multicollinearity. This is neglected in this work.



### 5.3 Logistic model results

As hinted in the previous chapter this analysis will be performed by working with the logistic model. It is a regression model and as such, it is a statistical relationship between two or more variables where a change in the independent variable is associated with a change in dependent variable. Quite often logit models produce similar results to those generated by probit models. It is worth noting that both logit and probit models require more cases than OLS regression as they use maximum likelihood estimation techniques. It is sometimes possible to estimate models for binary outcomes in data sets with only a small number of cases using exact logistic regression. Anyway, the choice of logit over probit model or vice versa depends largely on individual preferences.

The path towards logit models goes through OLS regression. First, in the figure below is presented the OLS regression of the observed sample:



Source: own figure

**Figure 9: OLS plot**

When used with a binary response variable (i.e. yes/no, or 1/0 etc. type of models), this model is known as a linear probability model and thus, can be used as a way to describe conditional probabilities. However, the errors (i.e. residuals) from the linear probability

model violate the homoskedasticity and normality of errors assumptions of OLS regression, which could result in invalid standard errors and hypothesis tests.<sup>132</sup>

The next table below gives an overview of the logit model applied on the obtained data sample. It shows the coefficients with its standard error, z value and  $\Pr(>|z|)$ .

Call: glm(formula = Y ~ X, family = binomial(link = "logit"))					
Deviance Residuals:	Min	1Q	Median	3Q	Max
	-1.6324	-1.0042	-0.6579	1.1922	2.0659
Coefficients:	Estimate	Std. Error	z value	Pr(> z )	
(Intercept)	-7.816e+00	2.589e+00	-3.019	0.002537	**
Congruity	2.106e-01	2.136e-01	0.986	0.324340	
Age	-2.942e-02	2.980e-02	-0.987	0.323446	
TIlog	6.365e-01	1.802e-01	3.533	0.000411	***
# of rounds	-8.991e-02	8.606e-02	-1.045	0.296182	
ExperienceOfCVCinvestor	3.377e-03	1.715e-03	1.969	0.048929	*
TEA	-2.331e-01	6.402e-02	-3.641	0.000271	***
IPP	1.004e+00	5.436e-01	1.847	0.064739	.
DistanceInKm	-8.162e-05	2.648e-04	-0.308	0.757897	
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					
Null deviance: 628.42 on 470 degrees of freedom					
Residual deviance: 581.49 on 462 degrees of freedom					
AIC: 599.49					
Number of Fisher Scoring iterations: 3					

Source: own table

**Table 6: Logit model coefficients**

As one can see in order to generate the code the author uses the generalized linear model (GLM) function. By running the logit model we have our outcome called Y and the predictors X. This part of the code "*family=binomial (link = "logit")*" shows the type of the model. What one can see next is the deviance residuals. They are a measure of model fit. This part of output gives insights of the distribution of the deviance residuals for individual cases used in the model.

<sup>132</sup> Long (1997), p. 52 ff.

One line below in the table is shown the coefficients (also known as parameter estimates), their standard errors, the z-statistic<sup>133</sup> and the associated p-values. The former are the values for the logistic regression equation for predicting the dependent variable from the independent variable. They are in log-odds units. These estimates reveal information about the relationship between the independent variables and the dependent variable, in this case between the success and the 8 independent variables, where the dependent variable is on the logit scale. These estimates show the amount of increase in the predicted log-odds of success equals 1 (IPO or M&A) that would be predicted by a 1 unit increase in the predictor, holding all other predictors constant. In order to test whether the coefficients are statistically significant one should have a look at the columns depicting the z-values and p-values.

The  $\Pr(>|z|)$  column illustrates the two-tailed p-values which is testing the null hypothesis that the coefficient is equal to 0 (i.e. no significant effect). Null hypothesis means no correlation with the dependent variable. If there is no correlation, there is no association between the changes in the predictors and the shifts in the response variable. Usually, the value is 0.05, by this measure none of the coefficients have a significant effect on the log-odds ratio of the dependent variable. In other words, a predictor that has a low p-value is likely to be a meaningful addition to our model because changes in the predictor's value are related to changes in the response (dependent) variable. Contrarily, a larger (insignificant) p-value suggests that changes in the predictor are not associated with changes in the response. In our sample 50% of the coefficients demonstrate statistically significant features and the rest 50% do not, respectively. The logit/probit regression coefficients give the change in the z-score or probit index for a one unit change in the predictor. We see that congruity, age, number of rounds and distance are not very useful predictors as they have large p-values. On the other side, we have the useful predictors and statistically significant coefficients: TIlog, TEA, experience of CVC investor and IPP.

The z-value tests as well the null hypothesis that the coefficient is equal to 0. A z-value that is sufficiently far from 0 shows that the coefficient estimate is both large and precise enough to be statistically different from 0. On the other hand, a z-value that is rela-

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<sup>133</sup> Sometimes called a Wald z-statistic.

tively close to 0 indicates that the coefficient estimate is too small or too imprecise to be certain that the term has an effect on the response.

As the figures about the estimates above are presented in a scientific format it is easier for the reader to have clearer view of them. An easier to „digest“ way of presenting the coefficients is presented in the table below:

Independent Variables	Dependent Variable
	Y
Congruity	0.211 (0.214)
Age	-0.029 (0.030)
Tllog	0.636*** (0.180)
# of rounds	-0.090 (0.086)
ExperienceOfCVCinvestor	0.003** (0.002)
TEA	-0.233*** (0.064)
IPP	1.004* (0.544)
DistanceInKm	-0.0001 (0.0003)
Constant	-7.816*** (2.589)
Observations	471
Log Likelihood	-290.743
Akaike Inf. Crit.	599.485
Note	*p<0.1; **p<0.05; ***p<0.01

Source: own table

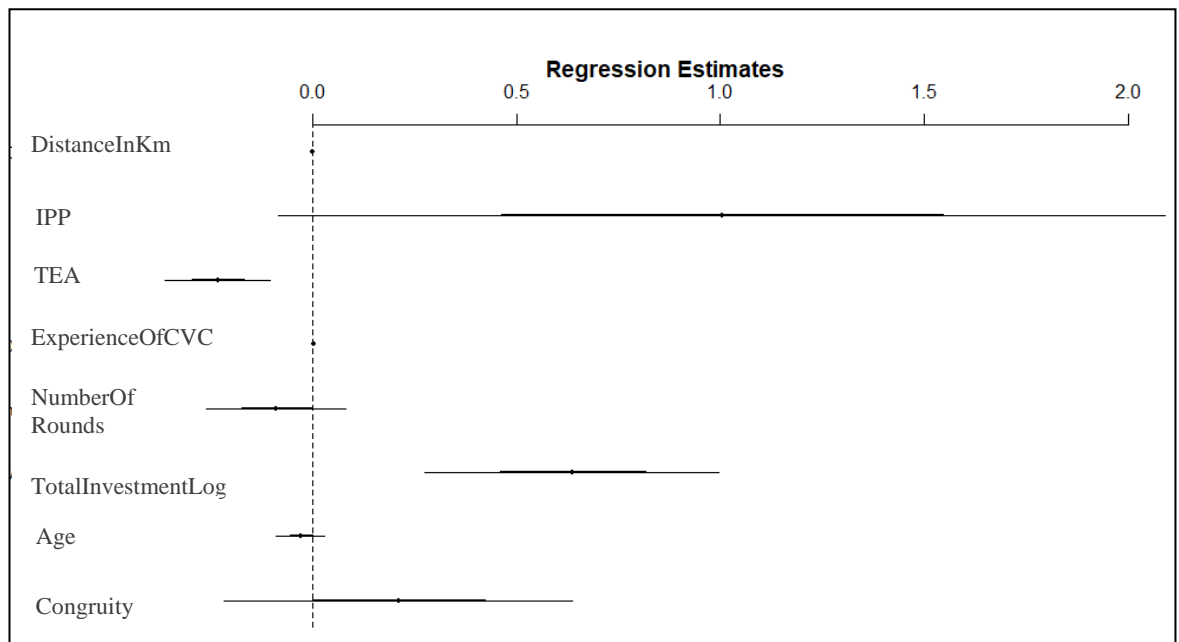
**Table 8: „Clean“ coefficients**

Generally speaking, the size of the coefficient for each independent variable gives information about the effect that variable is having on your dependent variable. When it comes to the sign of the coefficients, it gives the direction of the effect: plus sign makes the event more likely and negative coefficients make the event less likely. In our case there are 4 coefficients with positive signs and they are those (with some exceptions)

that have some level of significance to the model: Congruity, Tillog, experience of CVC investor and IPP. Distance and IPP are on the border around 0 which implies that the effect of the predictors is small to none.

In regression models with multiple independent variables, the coefficient shows how much the dependent variable is expected to increase when that independent variable increases by one unit, keeping all the other independent variables constant. The units are important in this situation.

A visual representation of the coefficient estimates is presented below:



Source: own figure

**Figure 10: „Clean” coefficients/regression estimates plot**

Figure 10 gives the reader an illustration of how actually the coefficients allocate around the 0. As it can be seen the most relevant conclusion that can be taken from it is that regarding the hypotheses that were developed earlier in this work. Going through each one of the hypotheses will finalize this thesis with the goal the author set at the very beginning-to see what are the determinants (if any) behind the success (or failure) of the CVC-backed companies.

Starting with hypothesis 1: The activity congruity between the CVC provider and CVC recipient is positively related to the success of CVC investments is correct. Based on the figure above and on the comments as well, one can conclude that congruity does not

have a positive impact on the success of the CVC investment. Congruity's p-value holds on the highest levels among the defined predictors. Although the coefficient is positive and relatively high above 0 the conclusion is that congruity does not fully „support” the success of a new venture towards its path to the stock exchange – it is insignificant. A small hint of the observed sample shows how this outcome would be possible. As seen the biggest investor industry is the media industry and the biggest recipient industry is the high-tech computer-related branch. Respectively, congruity is broken here. The hypothesis is not valid.

Hypothesis 2 questions whether there is a positive relation between the age of the CVC recipient and the success of CVC investments. As one can see the coefficient is very close but below 0. A negative sign means that all else being equal, outcome to equals 0 is more likely. In other words, the older the venture it gets the less chances of being successful. The hypothesis is not valid.

Hypothesis 3 investigates whether investing larger amounts of money in a venture (usually means more investors) contributes towards reaching an IPO or M&A. As it can be seen from Table 8 TotalInvestmentLog has one of the highest coefficient estimates: 0.636. Further, its p-value is very low. This combination says that, yes, the larger the investment amount the more likely a venture to succeed. The hypothesis is valid.

Hypothesis 4 checks how the number of rounds relates to the success of a venture. Counter intuitively, the coefficient “number of rounds” is negative. Its p-value significance is way below the other predictors. It turns out that young ventures that have an array of rounds and investment sessions do not contribute to its success. They might have many investment rounds but to attract only a few insignificant investors who do not add value. The result is that the hypothesis is not valid.

Hypothesis 5 examines if the experience of a CVC entity is positively related to the success of CVC investment. The answer, based on the conducted analysis, is yes. Intuitively, the higher the number of CVC recipients in your portfolio or the higher the number of CVC investments of a CVC fund in general, the better for its investees. Those ventures that receive funding from such investors demonstrate better overall performance and higher chances of success. The hypothesis is valid.

The next relation that is hypothesized here in this work is about the effect of the Total Early-Stage Entrepreneurship Activity (TEA) on the success of a venture, whether it determines its future development positively or rather neutral. In line with Kräussl and Krause (2011) the result of this work regarding hypothesis number 6 is that it is valid. Although the European market is more conservative than the US in terms of entrepreneurship activities it apparently has its effect on ventures. This hypothesis is valid as well.

One might wonder if those countries with weaker intellectual property protection (IPP) laws attract higher volume of CVC investors and in reality yes, in Europe it is like this. The relation between the level of intellectual property protection and the success of CVC investments is positive. Having a look at the IPP coefficient one can say it is definitely positive with 1.004 number and it has a very low statistical significance ( $p$ -value = 0.065). The intellectual property protection is important because those countries that do not protect their innovative companies can be easily exposed to fraudulent actions by competitors. Wherever the laws of IPP are not strong enough the chances for CVC investors to „steal” although legally is higher. That is why these regions are more appealing to investors as they might benefit substantially higher than in other regions with stricter protection. Ventures that are located in countries where these rules are working to a lower extent have higher chances of successful development as big corporation find it more lucrative for investments. Hypothesis is valid.

Last hypothesis that was presented is about the relation between the air distance of the CVC investor and its investee. Although the tendency is that CVC investors are getting more and more geographically agonistic, it turns out that this does not affect the outcome of an investment. The DistanceInKm coefficient is almost 0 and its  $p$ -value is 0.758. These figures reveal this predictor’s insignificance towards the response variable. In other words longer distance between the CVC players (investor and investee) does not guarantee brighter future for the CVC recipient. Hypothesis is not valid.

In chapter 3 the author presented a graph with expected outcomes of the hypotheses. Let us recall with the updated results.

Hypothesis	Independent variable	Expected relation (outcome) to the dependent variable	Valid or not?
H 1: The activity congruity between the CVC provider and CVC recipient is positively related to the success of CVC investments.	Activity congruity	Positive	Not valid
H 2: There is a positive relation between the age of the CVC recipient and the success of CVC investments.	Age of the investee	Positive	Not valid
H 3: The success of CVC investments is positively related to the size of the investment.	Size of the investment	Positive	Valid
H 4: The number of financing rounds in which the CVC recipient participated is positively related to the positive outcome of the CVC investment.	Number of financing rounds	Positive	Not valid
H 5: The experience of a CVC entity is positively related to the success of CVC investment.	Experience of CVC	Positive	Valid
H 6: Countries with higher TEA levels are characterized by more successful CVC investments.	Entrepreneurship activity	Positive	Valid
H 7: Countries with weaker intellectual property protection laws attract higher volume of CVC investors; The relation between the level of intellectual property protection and the success of CVC investments is positive.	Intellectual property protection	Positive	Valid
H 8: The distance between the headquarters of the CVC investor and the headquarters of the CVC recipient are positively related to the success of CVC investments.	Distance between CVC and investee	Negative	Not valid

Source: Own table

**Table 9: Valid/Not valid hypotheses**

The table above summarizes the outcome of the described hypotheses if they met the author's expectations or not. 4 out of 8 hypotheses were predicted correctly and 3 were set with wrong expectations. It turns out that congruity, age and number of financing rounds do not relate positively to the success of a venture. The rest of the expectations were met.



## 6. Conclusion and suggestions for further research

The aim of this master's thesis is to further widen the current knowledge of Corporate Venture Capital and to build upon the research contemplated by academics over the years. It analyzes the factors underlying the success of CVC-backed companies in Europe spanning over the period of 24 years, from January 1, 1990 till December 31, 2014.

As described in chapter 1 this paper is organized into six sections. At the commencement of the thesis has been composed a short introduction to bring the reader into the world of Corporate Venture Capital. A description of the main goals has been presented acquainting the reader with the aspects of contribution of this work and how it will bring value to practitioners.

Furthermore, in chapter 2, a comprehensive overview of the theoretical background information required for understanding the matter of Corporate Venture Capital has been provided and analyzed from different point of views expressed by academics and scientists. Internal Corporate Venturing is compared to the external form of it and their peculiarities. The important differentiation between CVC and Independent Venture Capital is analyzed and also a number of motives supporting the engagement into CVC are studied. It is interesting to understand how established corporations perceive CVC and whether they see benefits of having their own entity dedicated for such an initiative. On the hand the roots of CVC are in the strategic synergy between an investor and its investee but on the other hand financial returns are major bait that corporations chase. On the other side of the table are the CVC recipients and this thesis examines their considerations as well. As corporations' potential partners young ventures have an array of benefits of having wealthy "brains" together sitting around the table. As many things in life there are also some drawbacks and limitations that ventures need to keep in mind before embarking on such a new challenge.

In the third section the author introduces eight hypotheses outlining the body of the work. By doing that the dependent and independent variables are revealed. Success is measured in three forms – Initial Public Offering, merger of acquisition while the independent variables are activity congruity, age of investee, number of rounds, total size of

investment, distance between investor and investee, experience of CVC investors, level of intellectual property protection and entrepreneurship activity in the country. They play the role of determinants and hypothesizing them is what the focus is and they lay the foundations for the developing a statistical regression described in the consecutive chapter. The author's expectations regarding the outcome of the hypotheses are summarized and proof-checked later on.

Chapter 4 continues with deeper „dive” in the topic. First, the process of sampling the necessary data and the search criteria is described step-by-step. Thus, the sources the author uses for obtaining the necessary data are defined. The sample consists of 471 CVC investees and 86 CVC investors exclusively in Europe. The short-listed sample has been manually-filtered and the companies were checked one-by-one whether they fit in the scope of this work and if not were excluded. A more precise definition of the variables takes place in this section where success is set as dependent variable against the predictors. The model used to wrangle the data - logistic regression is presented and the author touches on OLS and probit models. The software on which the analysis is made is R Studio.

The next chapter is devoted to the final presentation of the results obtained by the model. It starts off by discussing the industry characteristics and plotting the main observations and trends recognized from the data sample. The general conclusion is that when observing the CVC business in Europe unambiguously, there is a difference between the West and the East. Western world has a proven track record of CVC investments with successful exits while the East is lagging behind with extremely low number of deals per year and low investments sizes. Certainly, the fraction of the West is more than 80% of the market against less than 20% for the East. The dominants are undoubtedly the old European powers, namely Germany, the United Kingdom and France which generate more than 50% of the market (both for CVC investors and investees). The leader is Germany with 24 clearly defined CVC funds and 112 investees. Close to 25% of all investees and near 30% of the investors are located there. Deutsche Telekom Capital Partners, HV Holtzbrinck Ventures, Tengelman Ventures, Deutsche Venture Capital, etc. are all big names on the scene in Germany. The United Kingdom, although considered the financial hub of Europe, ranks second. The most well-known players there are Unilever Ventures, DC Thomson Ventures, TTP Venture Managers and others. France

comes after them with their big corporate-funded VC funds – CEA Investissement, Dassault Développement, Thales Corporate Ventures and others. A clear trend observed from the data is that the focus of the investors lies in the high-tech, semi-conductor industry. They concentrate on products or services with high level of added value that can be easily multiplied and are scalable across the world. Under this umbrella belong innovative software solutions, FinTech or regulation technology start-ups, new kind of products that create completely new sector from scratch and so on.

Interestingly, the second place, when it comes to number of investees received CV capital, is occupied by the pharmaceuticals, life science & health industry. This industry sector attracts more and more funds with its expanding business opportunities. Due to the more stressful life style people tend to choose the easiest cure namely the pill. Investors see this area appealing and even relocate fractions of their budget from other sectors to the drugs business. Although many investees from that sector received funding, the second place occupied when it comes to investors is surprisingly the media industry. Swisscom Ventures, HV Holtzbrinck Ventures, Deutsche Telekom Capital Partners, Sanoma Ventures are the main „suspects“ in Europe from the media sectors. They deploy billions of euros in companies not only in Europe though but they have a global reach and scan ventures regardless of their location. Regarding start-up maturity it is not surprising that ventures aging between 1 and 4 years attract most of the CVC investors (60% of the sample). In the second place are companies that received their first CVC investment after their 5th anniversary but before their 10th. This group is represented by 97 companies (21% of the sample). Interestingly, 71 companies received their first CVC funding even before they were actually founded.

Regarding the maturity of the ventures by the time they receive their first CVC injection the result is clear: most attractive targets are companies between their 1<sup>st</sup> and 4<sup>th</sup> anniversary. 60% of the investees in the sample are at age somewhere in that range. While the IVCs tend to lower the average age of their investees, the CVC industry does not fully follow that trend. The reason is that VCs are more risk-oriented and financially motivated entities-they are interested in IRR. The CVCs look for strategic complementarity and put the financial ratios on a side.

Overall in the last approximately 25 years the trend in Europe is positive and the CVC funds expand their reach. This form of funding is gaining importance and more and more corporations establish new corporate-funded entities that deal with investments in young ventures.

With the help of R Studio the author conducted a logistic regression model based on the sample of companies obtained by the sources cited in this work. In essence, the logistic regression is used for cases with binary responses. Keeping this in mind the author has chosen this model as a suitable option. The main body of comments is on the significance and the sign of the coefficient estimates. On Table 6 one can easily see the figures for the coefficients with its standard error, z value and  $\Pr(>|z|)$ . They all work together but p-values and coefficients especially, to tell one which relationships in the model are statistically significant and the nature of those relationships. Coefficients show the mathematical relationship between each of the independent variables (8 in total) in the sample and the dependent variable while the p-values give information whether these relationships are statistically significant. The p-values for the observed variable are higher as well as lower than the given significance level. 4 of the variables show statistical significance which are: TotalInvestmentLog, ExperienceOfCVCinvestor, TEA and IPP. Based on these p-values there is sufficient evidence to conclude that the data favors the hypothesis that there is a non-zero correlation and thus a worthwhile addition to the analyzed regression model. Any changes in the independent variables are associated and will reflect with changes in the response at the population level.

On the other side there are the coefficients. What needs attention at first sight are whether they are positive (+ sign) or negative (- negative sign). This shows the direction and thus the correlation between each independent variable and dependent variable. A positive coefficient tells the reader that as the value of the predictor increases, the value of the response variable tends to go up as well. The negative coefficient reveals the inverse trend - independent variable increases, the dependent variable decreases. It shows how much the mean of the dependent variable changes if the independent variable changes by one unit while holding other variables in the model constant. By holding the other variables fixed it is easier to assess the effect of each variable separately. Here below is described the validation test of the developed hypothesis in order to close the topic successfully.

- H 1: The activity congruity between the CVC provider and CVC recipient is positively related to the success of CVC investments – not valid.
- H 2: There is a positive relation between the age of the CVC recipient and the success of CVC investments – not valid.
- H 3: The success of CVC investments is positively related to the size of the investment – valid.
- H 4: The number of financing rounds in which the CVC recipient participated is positively related to the positive outcome of the CVC investment – not valid.
- H 5: The experience of a CVC entity is positively related to the success of CVC investment – valid.
- H 6: Countries with higher TEA levels are characterized by more successful CVC investments – valid.
- H 7: Countries with weaker intellectual property protection laws attract higher volume of CVC investors; The relation between the level of intellectual property protection and the success of CVC investments is positive – valid.
- H 8: The distance between the headquarters of the CVC investor and the headquarters of the CVC recipient are positively related to the success of CVC investments – not valid.

50% of the hypotheses passed the validation test while the other half did not. This thesis proves that the amount of money a CVC investor allocates to a certain venture has a positive impact towards its way to the success (IPO or M&A). The same applies to the experience of the CVC investor – the more investments the investor has its portfolio the higher the chances of its investee to land on the stock exchange or gets acquired. The total level of entrepreneurship activity and the overall patent protection regulations in a specific country in Europe have their impact on the chances a venture becomes successful. The higher the TEA and the lower the IPP, the higher the chances for success for a venture in Europe.

At the conclusion of this thesis remains to quickly suggest further research areas which hopefully will contribute to the broad literature out there. First, this thesis could be used

as a base for similar in nature studies. One might consider going deeper with the logit model and exclude those statistically insignificant independent variables for better accuracy of the model. Using probit model instead of logit to compare if there is any difference in the results and analyze the reasons could be a suggestion which could bring some value to the topic as well. There is room for improvement of the data sources as well. Lots of the data on the web is either outdated or not correct. A deeper and more diligent selection with access to internal data from CVCs would make results more precise.

Corporate Venture Capital is a form of VC where corporate funds are allocated in new disruptive ventures. Young companies should certainly not exclude this source of funding as the tendency is to broaden its reach not only across Europe but worldwide. Both corporations and start-ups can take advantage of CVC and use it for mutual benefits.

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