

# **Corporate Innovation: An Analysis of German Corporate-Startup Cooperation and Corporate Venture Capital**

vorgelegt von

MSc

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## **List of Abbreviations**

CVC - Corporate Venture Capital

HQ - Head Quarter

IPO - Initial Public Offering

KPI - Key Performance Indicator

M&A - Merger and Acquisitions

R&D - Research and Development

VC - Venture Capital

# Introduction

Innovation is often the key to success for corporations and startups. Ries (2011) defines startups independent from its size or their industry, but with innovational focus. Achleitner (2018) explains startups as young, not yet established companies, founded typically with little seed funding. Corporations are large public traded companies or groups acting as a separate legal entity with limited liability of the owners (Veldman & Willmott, 2013). The different organizational structures, size, resources, and capabilities of startups and corporations lead to distinctive ways of conducting business.

Startups have the ability to build products and services in a lean, fast, and straightforward way. Commonly there are fewer regulations for startups to develop their business, as administrative processes and structures are not yet established. Those fewer regulations make startups more agile and enable them to set off innovations quickly. In contrast, corporations tend to have more regulatory constraints as, e.g., the obligation of reporting to the shareholders of the company. The corporation has a core business to follow, where its expertise and value lies, which constantly occupies large parts of resources. Hyytinen et al. (2015) express startups as more flexible compared to established organizations.

Innovations are costly because they often require resources detached from the core business. Accordingly, resistance of whether innovation is necessary can come up in corporations management (Fischer & Rhode, 2013), which is often intensified by the degree of uncertainty. Consequently, doubt of necessity of innovation can arise at corporate departments, caused by the aim and benefits from their investment (Durana et al., 2020). The different stakeholders of corporations have their own distinctive incentives to innovate. There are several approaches considered “the right way to innovate,” depending on the particular origin of innovation. From a



corporation's perspective, a distinction of internal or external innovation can be made, where research and development (R&D) stands for the internal source of innovation, in contrast to innovations developed externally. Tecce (1987) states that know-how needs to be transformed into a viable product, requiring technological know-how, manufacturing know-how, market know-how, and financing. The corporation might be able to produce and develop products on their own; however, this might be cost-intensive and time-consuming. Therefore, only focusing on internal R&D and product development could not lead to the desired outcome of corporate innovation. Hence the corporation might need to gain access to know-how through external innovation initiatives like startup cooperation. Cooperation of corporations and startups are ways to jointly innovate and make use of synergies and combined capabilities. Zhou and Li (2012) explain that new product development is a positive function of strategic cooperation, reasoning that new products cause the need to share information. Cooperation's could be fast ways to bring assets together. To facilitate innovation in order to gain competitive advantage (Bigliardi & Galati, 2013; Dereli, 2015), corporate-startup cooperation can be one important medium. These innovations can support and improve corporations' business – e.g., in form of products or services developed.

The current monetary policy, results in low interest rates and therefore should lead to significant capital market supply. The abundance of low-cost capital increases Venture Capital (VC) investments in startups (Bellavitis, 2016). The actual economic situation across industries in global markets is perceptible and driven by technological change. These significant changes in the economic environment lead to uncertainty for corporations and their proven business models. In order to retain market relevance or gain competitive advantage corporations are trying to develop and transform their businesses. Many small companies entering the market with new technologies and services shaping the current market situation. Those startups are often innovation drivers and

challenge existing products and services (Eftekhari & Bogers, 2015). As brand loyalty declines, the risk of new products entering the market increases and challenge corporations (Rigby & Bilodeau, 2013). Corporations are concerned about business transformations and market changes and recognize the need for innovation, organizational development, and new practices. This economic turmoil influences the effect of learning and performance. Jiménez- Jiménez and Sanz-Valle (2011) state that more radical innovation has to rely on learning to be successful. Therefore, corporations need to learn about external innovations and evaluate their own business practices to manage business transformation successfully. The right balance between the core business, new business opportunities, and innovation has to be established. The challenge for corporations is to combine internal and external innovations. Therefore, corporations need to precisely coordinate their innovation strategy and resources.

Due to the actual remarkable industry, fiscal, and overall economic times, the dissertation is developed on scientific theories and discussions with additional insights of practical experiences made at Volkswagen. The technological advancement and regulatory changes promise groundbreaking opportunities and threats for the automotive and several other industries.

Therefore, the dissertation focuses on external innovation initiatives of corporations and analyzes corporate-startup cooperation and startup investments. The ways and reasons of corporations engaging in startup cooperation are of interest. Thus, the organizational structure of corporate-startup departments is investigated.

The different cooperation forms of corporations and startups are evaluated with a focus on the use and characteristics of venture capital (VC) in the corporate context, namely corporate venture capital (CVC). The different strategies of CVC will be examined concerning financial or strategic focus. The aim and scope of this dissertation is to better understand the current focus and structure

of German corporations concerning startup cooperation. Therefore, the dissertation provides new insights into very recent developments of German CVC firms. Also, the startup perspective with regard to corporate-startup cooperation is investigated. Startups have different perceptions about cooperation and pursue other objectives regarding their characteristics and goals, which influence cooperation forms. The obstacles faced by the various cooperation forms are of interest and will be investigated. As corporate-startup departments and CVC firms are examined, the dissertation elaborates on the question, whether CVC is beneficial and preferable for startups, compared to startup cooperation without investment. Moreover, the dissertation gives insights of how startups are selected and evaluated from the relevant corporate departments and in particular describes this process at Volkswagen. The different perceived importance of startup evaluation criteria of corporate-startup departments and CVC firms is described.

The study enlarges the rather small academic research on corporate-startup cooperation. Hence, the purpose of the dissertation is to investigate corporate-startup initiatives used in today's economic environment. Insights how German corporate-startup departments and German CVC firms transform and behave on markets might be of interest internationally and could potentially be used as a benchmark for corporations, at least in Europe.

The dissertation is divided into ten Chapters, where Chapter one describes and elaborates on the practical experience made at Volkswagen. Chapter two describes the research design. Chapter three will examine corporate innovation and entrepreneurship. The different cooperation forms and requirements for corporations and startups are described. Chapter four analyzes and discusses the survey results of the German corporate-startup departments. Chapter five explains the fundamentals of VC and links existing theory and research results to current challenges of corporations. The aims and incentives of CVC will be analyzed with their different investment focuses and strategies and elaborate on the capabilities and organizational structure of CVC.

Chapter six presents the results of the survey of CVC firms in Germany. Chapter seven outlines the startup criteria and aims regarding cooperation with corporations. Chapter eight elaborates on the advantages and obstacles resulting from cooperation for startups and the startup survey results are discussed. Chapter nine examines whether investments in relation to corporate-startup cooperation are sensible. A binary regression measures the effect of the probability of choosing CVC over corporate-startup cooperation without investment. Chapter ten shows the corporate evaluation measures of startups with corporations and their perceived importance of startup selection criteria. Lastly, a conclusion is drawn based on the practical experience, scientific literature, and the survey results.

## **Chapter 1**

### **Situation at Volkswagen**

The automotive industry is in a time of transformation, as new powering drives, autonomous driving, and shared economy reshape the core business. These shifts result in new opportunities and threats for car manufacturers and current business transformation. In order to maintain market relevance, car manufacturers need to adapt to changes and prepare for the uncertain future development. One crucial aspect for car manufactures is to search and develop new business models and technologies for prospective future business segments. As a consequence, initiatives and new departments were created at Volkswagen to address, foster, accelerate, and enable innovation.

The authors department at Volkswagen is called the Ideation:Hub and is located in the Group IT of Volkswagen. Ideation:Hubs and thereby our mission is to demand and promote innovation at Volkswagen. Hereby, the fundamental task is divided into two main areas of responsibilities. The first area of responsibility is to promote innovation internally through workshops in corporate functional departments with the aim to teach new innovative business methods and challenge existing work processes, to positively facilitate innovative change. Demonstrating new ways and possibilities should give impulses to create innovation, developed internally. The second area of responsibility is to promote and bring external innovation into the organization, with the main focus to find suitable startup solutions and to set up startup cooperation. The startups and potential partners for Volkswagen, who could positively influence firms' performance, are screened and identified. The strategies used and challenges experienced, build the groundwork of the dissertation.

In order to establish startup cooperation, we function as an intermediary between startups and the specific corporate departments. We promote digital transformation of all brands, acting as matchmaker in order to connect suitable innovations from startups with internal challenges of the Volkswagen Group. We act as the initial point of contact for startups in the Group IT, enabling startups to present their products to Volkswagen. Furthermore, our department constantly works to improve and build up a network in and outside the organization. If a startup convinces our needs, it will be invited to pitch in front of the right decision-makers at Volkswagen. In cases of a successful pitch, different cooperation methods are possible: Pilot-projects, participation in the Incubator and Merger and Acquisition (M&A). With the help of startup cooperation, we try to contribute to the competitiveness of Volkswagen.

There are two different approaches used by us to facilitate startup cooperation for Volkswagen. The first approach is to evaluate registered startups and introduce them to suitable functional departments of Volkswagen. The startups are evaluated, preselected and presented to the corresponding functional department. The functional departments then decide whether startups have the competence to be a potential cooperation candidate.

Our department actively identify functional departments, who might benefit from startup cooperation. As a result, we reach out to respective functional departments of Volkswagen and try to examine potential needs for startup cooperation. As most functional departments do not demand startup solutions and as a consequence the need for startup innovations are propositions from our department, for departmental responsibility. The second approach is targeted research offered on the application of functional departments to find startups based on specific needs or fields of interest. The startups are identified on special requests and requirements. In cases of mutual interest and more concrete cooperation intentions, the process of startup cooperation is accompanied by our department.

Through our role as matchmaker and innovation driver, our department needs to have an overview of existing startups, possible solutions, and technologies. Therefore, we continuously screen markets, technologies, and search for potential startups. To increase our external visibility and inform startups about our mission as well as to offer startups the possibility to get in contact with Volkswagen, our department established a website. On our website, startups can register their products and possible solutions, which are afterwards evaluated by our department. Moreover, through the registration, startups accept the data protection regulations of Volkswagen, allowing us to distribute their solutions and information to potential functional departments in the organization. In addition to the website, our department actively introduces itself to startups on

events, through the media and personal contacts within the “start-up scene”. The principal behind the constant scouting of startups is to establish an extensive database of potential startups, suitable for Volkswagens' functional departments. The focus areas defined, are very broad and all subject areas might be suitable, as long as startups are able to create possible value for Volkswagen. As the Volkswagen Group is quite large several startups in different business fields could qualify. Even though, the thematic areas of new mobility, industry 4.0, and battery technology were constantly in focus. As the outcome of cooperation is influenced by the corporation and the startup, our department has to make sure that startups and functional departments align common interest. Furthermore, both parties have to be motivated to work together and generate value for Volkswagen and startups. This circumstance calls for the right timing to match the needs and resources of both parties.

In order to get attention and gain visibility from the startups and in the startup ecosystem, our department attends and visits various startup events. On events, we use different forms of engagement, ranging from attending and approaching startups by startup scouts, setting up a Volkswagen booth, up to the sponsoring of events. Startup events differ by focus areas, size, and quality, and our outcome is highly depended on the quality of the startups attending. Therefore, the right events have to be selected to increase the probability of getting to know startups in the suitable focus areas, products, and quality. Additionally, media attention of the events is of importance, in order to scope our visibility and value proposition to the startups. Moreover, due to targeted scouting, several startups were identified and contacted and stocked up our database.

Complementing to the external scouting and networking with startups, similar tasks had to be done internally. The service offered by our department had to gain visibility in the organization. Our department needs to establish its reputation in the corporate environment. At the start, many

functional departments were not aware of our department and mission. To act in the interest of functional departments and obtain necessary information, we need to know current standards of technology and their possible pain points. In order to obtain the necessary information about functional departments and establish our department as a “brand” for startup cooperation, we constantly presented our services to managers of functional departments. Furthermore, we tried to identify Volkswagen employees, who could be interested in promoting innovation and potential startup cooperation.

As corporations are large and typically have several business units, a trending topic as startup cooperation, with massive possible potential, generates and attracts the intention of several departments. Therefore, a number of initiatives were launched at different units of Volkswagen. To prevent duplicated work, learn from the mistakes of other initiatives, and increase Volkswagens internal synergy effects, our department introduced the “startup community.” The idea of the “startup community” is to connect all startup initiatives across Volkswagen to promote and exchange information internally. The different startup initiatives should inform, and share experience made with regards to challenges and obstacles faced of their attempts of startup cooperation. Regular community meetings should strengthen internal network and cooperation behavior. Therefore, during frequent community meetings, current projects, challenges of “individual” startup work are discussed.

The evaluation criteria of startups in use at our department are presented in the following. The assessment of individual startups found proactively or by applications is based on a three-step approach. We assess the startups with the internally developed quick-check, advance-check, and an evaluation and discussion of those in corresponding team-meetings.



Step 1: The quick-check was based on the information given by the registration of the startup, submitted at our website. Here startups could select whether they are interested in participation and want to apply for the incubator program in Dresden. Our department has a close working relationship with the Future Mobility Incubator of Volkswagen in Dresden. Our department helps to identify and evaluate potential startups for the incubator and offers business and operational support for startups participating in the incubator program.

If a startup is scouted, we requested startups to register at our website, to provide all necessary information. The following information should be provided:

- Contact Information
- Business Field
- Contact to Volkswagen
- Short Description
- Existing Solutions
- Comparability to Volkswagen
- Business Stage
- Business Model
- Target Group
- Added Value
- Unique Selling Point
- Team and Tech Expertise

Based on the given information, our department tries to assess the possible value of the startup and determine whether the startup might be suitable for Volkswagen. The quick-check serves as a pre-

selection tool to decide and guarantee a certain degree of quality of the startups in our database. Moreover, it ensures some degree of involvement with the startups. If the startup is not rated as suitable based on the quality of application, maturity stage or product, the application is declined. The startup will be informed, that there is no active engagement from our department to pursue possible cooperation. If the impression and perceived quality of the startup are classified to be sufficient and the startup seems to fit the needs of Volkswagen, more time is invested in evaluating the advance-check.

## Step 2: Advance-Check

The second step and evaluation, called the advance-check was drawn up based on further research related to the startup and included the following steps:

- Degree on Innovation
- Customer Opinions
- User Experience
- Business Stage
- Company Profile
- Competition
- Market
- Financials
- Product
- People
- Business

Our department again assesses those points. The advance-check reviews the information provided by the startup in more detail and added supplementary information found, including a personal grading from one of our team members. By that, we should gain a comprehensive picture and knowledge about the startup.

During the last step, the team discusses the respective startup. After a positive team review, the startup got dispatched to a suitable functional department.

During our attempts to find and establish startup cooperation, several challenges are existing. Volkswagen is a very large organization with different fields, products and processes, and many functional departments. A major challenge is the magnitude of Volkswagen, with regard to organizational size and structure. The assessment of startups in several different fields is difficult, as it can require substantial amounts of background knowledge. The organizational structure, with its size, made it hard to overview and coordinate among different departments about the various startup initiatives. The quality of startups scouting and corresponding technology research might suffer by no clearly defined focus of interest. The ability to oversee internal and external progress and to anticipate demand is quite substantial. In relation to the startups identified and evaluated by our department, the startups need to fulfill a certain degree of quality, as trust and reputation are connected to our department and product offered. The task is to ensure a high quality and matching accuracy of startups provided to functional departments. The corresponding assistance during the onboarding process and cooperation need to be organized and be available when needed.

Even if the matchmaking between a startup and a functional department might fit, the managers have to be open for innovation and have the willingness and commit an extra amount of effort. The functional departments have their daily business tasks and struggles, with fixed budgets and planned workloads and resources for their employees. To convince Volkswagen employees about

the importance of startup cooperation often take substantial effort, as it might change the business procedure of the functional departments. Furthermore, startup cooperation might relate to a considerable amount of financial and operational risk. Moreover, reputation is essential in the startup scene, therefore expressed desultory interest in startups might negatively affect the company's standing in the startup ecosystem.

The corporate M&A department is willing to examine and invest in startups; however, only with majority investments over 50% in affiliated companies. Minority investments were not an investment option for our M&A department. As a consequence, minority investments are not able to realize under the current organizational structure. The establishment of a CVC entity is discussed on different managerial levels in the organization. Startups participating in the Volkswagen incubator, for example, asked for strategic investments from Volkswagen, which were not able to realize due to the missing investment vehicle. Therefore, CVC, as a vehicle of corporations, is discussed to implement and plays a significant role in this dissertation.

## **Chapter 2**

### **2.1 Research Design**

In order to advance research in the field of startup cooperation's between corporations and startups in the German market, the dissertation conducted three independent surveys. The research gap in the field was identified by the review of existing literature. The different surveys analyze the market characteristics, structure and business practices of corporate-startup departments, CVC firms of German corporations and startups operating in Germany. Generated by the practical experience at

the Volkswagen Ideation:Hub, dealing with corporate-startup cooperation, the research aims to explain the purpose and ways German corporations attempt to cooperate with startups. The reasons for corporations to work with startups, as corporate-startup initiatives increased in recent times, are discussed. The structure of such programs is of importance as startup innovation can be far-reaching and complex. Several different startup cooperation approaches exist and based on different capabilities, cooperation's need to be set in specific ways to create success and profitable outcome. Startup cooperation can be extensive and consequently affected by several organizational challenges. The different cooperation forms of corporate-startup departments and CVC, from the corporation's perspective, are analyzed. Complementary, startups operating in the German market are surveyed in relation to their characteristics, interests and obstacles about corporate-startup programs and CVC.

Based on the current economic conditions, the globalization and the technological progress, corporations need to develop their business and innovate constantly, to remain relevance and stay competitive. Innovation is a major factor of competitive advantage and business success (Lee et al, 2012). Kohler (2016) states in corporations fear of becoming obsolete persuade them to cooperate with startups. As several cooperation forms and models exist, the dissertation attempts to identify the different methods and capabilities of corporations trying to innovate with startup engagement. A quantitative research approach was undertaken to measure the specific characteristics of corporate-startup departments, CVC and startups operating in Germany. The attention is of collecting data on focus, performance and structure and their respondent's assessment of firm, market and self-evaluation. The surveys are organized in a clear structure with mainly closed and some open questions. The questions are structured in an identical construct, to provide internal consistency of the data obtained.

## **2.2 Research Studies**

### **2.2.1 Corporate-startup departments**

In relation to the mission of corporations to innovate through startup engagement, the organizational structure and ability to successfully cooperate with startups, should be a pre-condition to rewardingly operate in the uncertain environment of innovation. The limited time and sense of urgency of resources of entrepreneurs is on rare occasions seen in corporations, where the opportunity of innovation is a part of the portfolio and resources are present (Eisenmann, 2013). The cultural differences and different organizational velocity (Weiblen & Chesbrough, 2015), in combination with the not applicable designed management incentive to innovate of corporations (Beyer et al., 2011) challenge corporations to create suitable and effective corporate-startup departments. The evaluation and pre-selection procedure of startups decide about the quality and outcome of startup cooperation and thereby the success of corporate-startup departments and CVC firms. Therefore, corporations attach great importance to it.

In the survey of corporate-startup departments, the largest 40 German corporations were selected. The corporations are defined in this study by their market capitalization, with the intent to guarantee a certain level of comparability with regard to organizational size and structures. The characteristics and the way their corporate-startup departments attempt and structure their startup cooperation is of interest. The main purpose of startup engagement of the different departments

and their cooperation channels are investigated. The organizational structure of the corporate-startup department, with the ownership, budget and existence of startup engagement are presented. The number of startup projects initiated, and the time needed for initiation are inquired. The self-evaluation of startup-departments is of concern. Additionally, the perceived importance of corporate-startup departments of future organizational improvements enabling startup engagement is shown. The perceptual importance of corporate-startup departments of startup selection and evaluation criteria is presented. The resulting response is n=25 from the 40 largest German corporations across industries.

### **2.2.2 CVC firms in Germany**

Innovations can be costly, and entrepreneurs often miss the necessary resources to start or develop their business. VC firm takes an active role in investment to create value (DePamphilis, 2019). Tong and Li (2011) declare that in uncertain economic times, firms tend to undertake CVC investments compared to M&A engagement. CVC are required to leverage company resources e.g. technologies, capital, employees, company brand and are looking for ways to realize benefits from their investment for the parent company (Hill & Birkinshaw, 2014). Dushnitsky (2011) declares that CVC participation might result from the realization of corporations that they do not have any monopoly on the next promising business. The investment focus of CVC can be strategic, financial or a combination of both. A study of Siegel et al. (1988) find that the majority of CVC in the United States are aiming for indirect strategic benefit instead of financial return. Lerner (2013) states that the organizational structure of corporations can be very complicated, which might make efficient CVC structures in corporations hard to assess. The ownership of CVC firms in corporations, as well as the source of CVC employees and the organizational structure might be relevant factors for successful CVC operation. Yang et al. (2016) express that structural autonomy and CVC firms

independence of corporations should empower investments without strategic attention of the corporation. CVC might struggle and constantly fight for resources, additional to internal politics, which might hamper CVC activities (Skyes, 1986). Corporations tend to have certain codes of conduct and follow specific regulations. Several startup cooperation programs exist, with additional corporate investments in VC.

The survey of CVC firms in Germany resulted in n=15 corresponding responses from 34 contacted German CVC firms from corporations across industries. The strategic orientation of CVC firms is investigated, whether they follow a strategic, financial or a combined investment strategy. The strategic objectives of CVC firms are shown. The time of CVC firm's existence, organizational ownership, organizational structure and source of employment are presented. The perceived importance of factors to regard investments as success are illustrated. The relative importance for strategic fit and financial return of potential investments is subdivided by means of the different strategic orientations. In order to provide a market evaluation, CVC firms express their assessment of current startup valuation and the quality of startups. A self-estimation of necessity of CVC for successful startup work is presented. Moreover, the additional investments of corporations in external VC funds are of interest. A market evaluation of CVC firms about current startup valuations and the quality of startups in the market and the perceived importance of CVC firms of startup selection and evaluation criteria is provided.

### **2.2.3 Startups operating in Germany**

Startups and corporations have different resources, structures and routines (Weiblen & Chesbrough, 2015). They have innovational capabilities, but often face the challenge to enter the market (Khilji et al., 2006). The limited financing capabilities, the availability of complementary assets and a more competitive business environment are factors encouraging start-ups to search for



external resources (Gaba & Bhattacharya, 2012). The cooperation with corporations can help to overcome startups liability of newness and smallness (Dahlander & Gann, 2010). Stuart et al. (1999) state that investments and non-investments in startups can have positive signaling effects for startups quality to the market and positively impact their reputation. Moreover, startups can gain access to production facilities and corporations' network. However, startups can be exposed to organizational power and scope of corporations (Chung, 2012). Moreover, the risk of losing intellectual property because of cooperation (Alvarez & Barney, 2001) might be a great concern of startups. The different culture and organizational structure and working habits can be a potential threat for successful cooperation.

The survey investigating startups operating in Germany resulted in n=101 responses out of 591 targeted companies across industries. The different sources of financing from startups is shown. The capital startups already received as funding in comparison to the capital they want to raise is illustrated. Startups participation in particular startup programs and additionally their perceived importance of characteristics of startup support programs is reported. The perceived importance of startups, when accepting an investment from CVC firms is presented. Concerning startups willingness to cooperate with corporations, the main reasons and main concerns of startups are investigated. Additionally, the time horizons of startup cooperation, their perceived evaluation of the investor market and the access to capital is shown. Moreover, startups specify their preference of CVC or corporate-startup cooperation without investment.

## **2.3 Sampling and Measurement**

The goal of every study has to be to clearly define the research and planning process to implement the appropriate level of measurement. The resulted statistics describe quantitative information

derived from a sample of an entire population. It should summarize the given data derived from the sample in tables, graphs and analyzing relationships. It aims to summarize and clarify the data analyzed. The data provided from a larger sample is used to draw conclusions, making predictions of the future or making decisions.

The research design used in this dissertation, results mainly in descriptive statistics, presenting the different survey results in tables and graphs. The mean value is used for the perceived importance of the selection criteria and market evaluation.

In order to decide which measurement instrument was suitable for the purpose of this dissertation, experiments and observations were not adequate to provide necessary data. The data needed for corporate-startup departments, CVC firms in Germany and startups operating in Germany was not available on any public database. Therefore, surveys and interviews were the two remaining options for data collection. The suitable measurement instrument based on data availability and actuality was anticipated. The theoretical framework defines the choice of measurement (Fagarasanu & Kumar, 2002). There are different measurement instruments, for data that is already present and for information that needs to be collected. The aim was to get the data from the most relevant corporations in Germany of corporate-startup departments, CVC firms and startups. The survey should cover a great extent of existing departments and CVC firms in Germany to increase the sample size and ensure market comparability. Interviews were hard to realize as the respondent target group is very time sensitive. Due to the bias in the dropout rate and non-response bias, caused by measurement administration (Strickland, 1996), interviews were not the sophisticated measurement instrument. Non-response is the failure of data collection or responses from the sample (Kish, 1965). Moreover, surveys often result in higher comparability, due to standardized responses. The reasons why the target groups did not respond were miscellaneous, as corporate-

startup departments refused to respond at first due to no-interest, no time or to many other survey requests. CVC firms were mainly concerned about confidentiality of their responses. As a consequence, the target groups needed to be approached several times to increase the response rate. Processing errors could appear when the resulted data is transmitted to the computer. However, the chosen online questionnaire made it possible to synchronize the data directly into Excel and subsequently to SPSS, the used statistical software tool. The questionnaires are in similar structure and designed to guarantee a certain degree of comparability.

The sampling method used for the dissertation is purposive, as it is based on different criteria. The corporate-startup departments, CVC firms and startups were targeted and selected based on specific characteristics.

The corporate-startup departments are actively trying to work with startups. That might be a department with an innovational context, searching and working with startups. The pre-selection is based on extensive online research, whether the corporation department indicates startup cooperation as one of their missions. Furthermore, as the data or information perceived might be misleading, the survey controlled for the active startup work. Respondents, only with active startup engagement were directed to the questionnaire. The CVC firms were easier to identify as their entities are more specialized. However, to have consistence the questionnaire also controlled for startup investments. The startups are early or growth stage companies, that are operating in Germany. The pre-selection was done through CrunchBase and F6S, where startups are listed and could be identified. CrunchBase is a database provider and news portal for company and business information and F6S is a platform for founders enabling them to connect with investors, businesses and organizations.

In order to increase the number of respondents, startups operating in Germany were selected. Additional recipients were identified through personal contacts, where respondents were contacted via email and phone.

The management of corporate-startup departments, CVC and startups was targeted to ensure a certain level of operational knowledge and strategic information. The three questionnaires were distributed via email, leading recipients to the online surveys with questions regarding strategic orientation, organizational structure, and perceived importance of corporate and startup cooperation. The surveys were created with google forms, including multiple choice and open questions.

The resulted scales are categorical, mainly nominal in the study. The purpose of a Likert-Scale is to identify the perspective or opinion on a certain stimulus. The used Likert-Scale in the dissertation should provide the perceived importance or certain characteristics, challenges of corporations, CVC and startups. The statistics are show in percentages, as the relationships of the different programs, structures and characteristics are of interest. The multiple response questions, with more than one possible answer, are shown in the percentage of the cases, with respect to the individual answer of the respondence. The descriptive analyses describe data obtained in the past and gives insights of situations and characteristics. The data can be used to predict future events or inform about the status quo. The aim of descriptive statistic is to summarize, present and clarify the data to provide an overview or make data easier to interpret.

### **2.3.1 Corporate-startup departments**

The analysis includes the purpose, organizational structure and available resources of corporate-startup departments. An overview of corporate-startups structure and how they operate, as well as focus of the German market is provided with the following questions:

1. The main purpose of corporate-startup departments. The question is examined to find the purpose that the individual corporate-startup departments pursue. The main purposes include (*improvement of processes, discovering new technologies, digitalization, product development, cultural change, market access*). Thereby the main reason for the different startup cooperation programs can be anticipated. N=25
2. The different corporate-startup channels used to engage with startups are investigated. The question is structured as a multiple response question, as corporate-startup departments are able and often use multiple channels to engage with startups. Possible answers: (*incubator/accelerator, startup events, startup scouts, venture capital, external agencies*). As there are different and often similar definitions of incubators and accelerators used, they are combined as one channel of startup engagement. N=24
3. The ownership of startup work is distinguished between the different organizational levels, who are being responsible for the corporate-startup department. The question aims to show the level of seniority of ownership of the startup work. Possible answers: (*work level, middle management, top management, management board, other*). N=25
4. The budget explicitly planned for their corporate-startup work is of interest. The distribution of planned and unplanned budgets indicate the different departmental flexibilities and how corporate-startup departments can engage in startup cooperation. As a planned budget is limited, it should be directly available for corporate-startup departments. Possible answers: (*yes, no, other*). N= 25
5. The time horizon of the existence of corporate-startup departments indicates whether corporate-startup departments are relatively new or already engage with startups for some period. Possible answers: (*> 1 year, 1-4 years, < 4 years*). N=24

6. The time needed to initiate a startup cooperation is crucial, as time is an important factor for innovation and for startups. Startups tend to have limited resources and are not able to invest indefinite capacities into uncertain corporate-startup cooperation. Possible answers: *(0-3 month, 4-6 month, 7-9 month, 10-12 month, >12 month)*. N=25
7. The number of projects initiated by corporate-startup departments is a valuable measure to show the activities done by corporate-startup departments. As projects are often defined differently by individual department, the results only indicate the activity of startup cooperation and will not provide any meaningful comparability between the departments. Moreover, it is also time sensitive, as corporate-startup departments, which exist longer had more time to engage with startups to initiate projects. Possible answers: *(0, 1-3, 4-6, 7-9 10-12, >12)*. N=24
8. The perceived success of startup cooperation is of interest, as it might be difficult to be measured by KPIs, which assess whether startup cooperation's are successful and add actual value to the corporation. The corporate-startup departments should evaluate and assess their startup work and outcome. Possible answers: *(yes, no, not sure)*. N=25
9. The perceived importance to improve their own startup work is used to show the possible hurdles and struggles, corporate-startup departments facing for successful startup cooperation. The question is dealing with the organizational structure and might indicate how the corporation can improve their structural composition. The perceived importance is measured on a 7-Point Likert-Scale for the different factors: *(higher startup budget, higher ownership of innovation, lower hierarchies, lower administrative hurdles, lower resistance of workforce)*, where 1 is (not important at all) to 7 (very important). N=25

### 2.3.2 German CVC firms

The survey and analysis conducted of German CVC firms resulted in overall n=15 respondents to provide an overview of the structure, investment focus and criteria of CVC in Germany. The questions of interest analyzed are structured in the following way:

1. The strategic orientation of German CVC firms is investigated, whether they follow a strategic, financial return or combined investment strategy. Financial oriented CVC firms can have a very broad investment focus, aiming for return on investment. The strategic oriented CVC firms are industry related and might enable strategic benefits for the corporation. The combined focus shows a hybrid structure, where both investment outcomes are of value for CVC firms. Possible answers: (*strategic focus, financial return focus, combined focus*). N=15
2. The different investment objectives are reported by a multiple response question with the aim to give an overview of the actual strategic investment goals of CVC firms. Possible answers: (*new technologies, digitalization, market access, product development, improvement of processes, other, strategic investments, financial return*). N=15
3. The time of existence of CVC firms is of interest as investment returns often need time to be realized. Moreover, the experience and learning made by CVC firms should have impact on their success. Possible answers: (*< 1 year, 1-4 years, >4 years*). N=15
4. The organizational structure aims to show whether CVC firms are operating under corporation's organizational structure or as separate legal entities. The different

organizational structures can indicate the degree of operational freedom of CVC firms. The different departments operating under organizational structure are clustered as corporation department. Possible answers: (*R&D, IT, finance, accounting, sales, marketing, strategy, production, legal, HR, other department, separate legal entity and other*). N=15

5. The ownership structure of CVC is valuable to indicate organizational endorsement of the CVC firms in the corporation. The higher the ownership of CVC, the more seniority and more support from the corporation should be associated. Possible answers: (*top management CVC, top management of the business unit, CEO of the company, board of directors and other*). N=12
6. Human resources of the CVC units are of interest, as the origin of the employed staff by CVC can indicate the employee's expertise and might impact the quality of investments. As internal resources could lack experience in the field of VC and might as well be influenced by the corporations working habits. Possible answers: (*external human resources, internal human resources, external and internal human resources*). N=15
7. The evaluation of investments and what kind of criteria is regarded as success for CVC are based on a Likert-Scale from 1 (not important at all) to 7 (very important). The mean value of the different criteria (*financial return, media attention, market access, new technology talent attraction, new products, strategic fit*) show the relative importance valued by CVC entities for their investment outcomes. The perceived importance should give an overview of how investments are evaluated by German CVC firms. N=13
8. In order to get a review of the anticipated startup valuations of the current startup market, CVC were requested to assess the startup valuation on a Likert-Scale from 1 (underrated) to 7 (overrated). In relation to the startup valuation of the market, CVC were asked about their perception of the current quality of startups in the market on a Likert-Scale 1 (not good



at all) to 7 (very good). Thereby an overview of current startup valuation and quality from CVC perspective is provided. N=15

9. The judgment, whether corporations are in need of an investment vehicle for successful startup work is analyzed. The startups provided their opinion, whether CVC is necessary for successful startup work. Possible answers: (*yes, no, not sure*). N=15
10. Whether corporations additionally to their CVC firms diversify their investment strategy by investing in other external VC funds is of interest. Possible answers: (*yes, no, is planned*). N=15

### **2.3.3 Startups operating in Germany**

As cooperation and investments of corporations into startups, their interests and obstacles of cooperating with corporations are analyzed. The structure of financing, capital required and reasons to work with corporations are among other things shown. The startups included in the survey are operating in Germany resulted in a number of respondents of N=101.

1. The source of startup financing is shown. As several different forms of financing are possible simultaneously the question is structured as a multiple response question. The possible financing sources are (*business angel, bootstrap, VC, sponsorship, CVC, bank credit, crowdfunding and other*) Sponsorship can have different definitions, in this case it is refereeing to grants of corporations or other startup support programs. N=99
2. The funding of startups is important. The capital received and the capital startups are in search for funding is provided. The mean and median are distinguished as large outliers can

influence the mean value. An indication of the capital requirements of startups can be derived in Euro. Capital received N=77 and capital in search for funding N= 81.

3. There are several different startup programs offered by governmental entities or corporations. The different attendance of startups in such programs, show the proportion of startups of program participation. The possible support programs are (*accelerator/incubator, governmental sponsorship, challenges, no attendance and other*).

N= 99

4. In relation to CVC investments in startups, where do startups place their importance concerning different capabilities and offerings from CVC firms. There are different requirements for startups which may be important to accept or consider CVC as potential investor. The importance on the different characteristics are (*operational support of investors, keep the majority of shares, investors network, investors reputation, strategic synergies*) is measured on a Likert- Scale from 1 (not important at all) to 7 (very important).

The mean values indicate the different importance of capabilities, which CVC firms might can consider, in order to be attractive. N=99

5. The main purpose, why startups want to cooperate with corporations is of interest. In order to anticipate and establish cooperation programs to engage with startups, the information indicate how to attract startups. Possible answers are (*the potential gain of a large customer, funding, network, product development, reputation and other*). N=97

6. Corporations are large and might be slow due to their organizational structure. The different concerns of corporate-startup cooperation can be diverse, through the differences in organizational structure, interest and market relevance. The question is structured as an open question and addresses the main concerns of startup cooperation. The answers

received resulted in N=55 and could be clustered in the following categories: (*dependency, bureaucracy, lose control, unclear agenda, negative effects for future funding, no concern*).

7. The structure, the offered support and services of startup programs from corporations are diverse. It is important and interesting for corporations to know startups needs and preferences regarding their cooperation programs. The perceived importance of (*network, funding, reputation, gain al large customer, brand awareness, access to facilities, technical knowledge and expertise, operational involvement*) is determined on a Likert-Scale from 1 (not important at all) to 7 (very important). N=99
8. The time horizon, startups are using for planning their cooperation, affect the form and type of cooperation. Therefore, the planning horizon of startups with corporations is of interest. Possible answers: (*short-term <1 year, medium-term 1-3 years, long-term >3 years*). N=99
9. Capital is propitiously due to low interest rates. Moreover, startups gain a lot of attention from corporations and VC, through new technological advancements. The question aims to assess how startups perceive the current investor market and the access to capital. The perceived importance is measured on a Likert-Scale for the investor market 1 (not good at all) to 7 (very good) and access to capital 1 (not difficult at all) to 7 (very difficult). The perceived investor market N=97 and access to capital N=98.
10. The preference of startups of accepting CVC investments or engage in corporate-startup cooperation is of interest. The possible answers (*CVC, corporate-startup cooperation without investment*). The selected factors that might influence startups preference for CVC or cooperation without investment are (*already VC or CVC funded, importance of strategic synergies, importance of reputation, already cooperate with corporations and market readiness of the startup*). The variable *VCorCVC* funded is coded by startups that are VC

or CVC financed. The startup development stage market ready is coded, resulted from the different startup development stages. N=96

#### **2.3.4 Startup Selection Criteria**

The different corporate-startup departments and CVC firms in Germany were examined about their perceived importance of the skills and characteristics of startups. The selection criteria can provide insights for startups, what are essential points of importance to consider when they seek for corporate-startup cooperation's or CVC investments. The importance of startup selection criteria of CVC firms in Germany is slightly different, as selection criteria have different objectives due to CVC investment focus

The valuation criteria can be distinguished between firm-specific, market and industry specifications the startups are operating. The evaluation criteria are based on the practical experience and relevant literature.

1. The importance of startup selection criteria of corporate-startup departments is developed on a 7-point Likert-Scale, where 1 (not important at all) and 7 (very important). The mean values are calculated and are being compared. The following selection criteria is used: *(founding experience, academic background, working experience, personal relationship, references of the startup, seniority level, market readiness, media attention, market access, financial return, new technology, new products, talent attraction, regional distance, concrete use cases)*. N=25
2. . The importance of startup selection of CVC firms show several equivalent evaluation criteria in relation to the corporate-startup departments. The 7-point Likert-Scale is used,

with 1 (not important at all) and 7 (very important). The selection criteria used: (*founding experience, academic background, working experience, personal relationship, reference of the startup, interpersonal chemistry, market readiness, possible market size, market competition, scalability of the product, quality of the product, profitability of the startup, growth potential of the startup, potential return of investment, strategic-fit, venture capital support, referrals*). The resulted n=14 except for referrals and market readiness N=13.

3. The German CVC firms were questioned to rank seven different startup characteristics. The least important attribute is valued with 1 and the most important with 7. The results should indicate the order of importance attributed by German CVC firms regarding the characteristics for startup investment. The characteristics to rank are: (*team of the startup, market potential, unique opportunity, product, gut feeling, financial situation, trusted referral*). N=14

## 2.4 Analysis

The data set contains data from the samples of corporate-startup departments, CVC firms and startups operating in Germany. Little public data is available in the field of research and no central reliable source of data, in the area of interest, could be identified. Therefore, the data had to be obtained. The analysis included to design the surveys, code and define the obtained data and control for validity and reliability. The data obtained from the three independent surveys, where transformed into the statistical analysis tool SPSS. The answers from respondents had to be coded, into numbers and defining their measurement scale. The majority of data is nominal and ordinal. Moreover, the data had to be checked for completeness. The multi-response questions are redefined

in dichotomies from (0-1). The majority of statistics are shown in frequencies, showing percentages of how often an observation occurred in the study. The results are presented in bar, pie charts and tables.

The questionnaires are structured with mainly closed questions. The results allow objective reporting of results, presenting descriptive statistics. The reliability of the data should be provided for the time the data is obtained. As the dynamics of markets, economic factors and organizational structure changes the data has reliability for the time the data is obtained. The data was obtained in Q1 and Q2 in 2019. The validity of data is tried to obtain by extensive online research and market knowledge, where the right respondents could be identified. Missing by design was used, to identify non suitable respondents that were accidentally targeted. The first question has to be confirmed to be able to fill out the further part of the questionnaire. The item non-responses, where single answers of questionnaires are missing, had to be taken into account. The data received from the three independent surveys was tested on normality, however a normal distribution was not given. Therefore, non-parametric tests were used in this study to analyze the data.

The misinterpretation of certain questions or the risk of respondents imprecise responding, could lead to biases in the study. Moreover, the self-confirmation bias should be considered as respondents were questioned about their actual business activity and success. Nickerson (1998) defines the confirmation bias, as seeking and interpreting evidence on the basis of own expectations, beliefs and hypotheses. A large sample should lead to less biases in the statistical data analysis. The sample could be vulnerable to the coverage and nonresponse error.

#### **2.4.1 Corporate-startup departments**

The frequencies of the (main purpose of corporate-startup work, corporate-startup channels, ownership of startup work in the organization, budget of startup work, number of startup projects initiated, time of startup engagement, time needed for initiating startup cooperation and perceived success of startup work) are analyzed. The importance of corporate startup departments for possible future improvements and the importance of different startup selection criteria is calculated by the mean value of response.

#### **2.4.2 German CVC firms**

The statistical test used are mainly frequencies to show percentages of the different characteristics of German CVC firms. The attributes in the study calculated in frequencies are (strategic orientation of CVC, objectives of CVC, time of CVC existence, organizational structure, ownership structure, human resources employed by CVC firms, necessity of CVC for successful startup work and corporations' investments in external VC funds). The perceived importance of CVC investment success is calculated with the mean and compared for the different characteristics. The importance of investment success for strategic-fit and financial return is calculated show mean values of the different strategic orientations of CVC firms, segmented by strategic orientation. The focus of corporate venturing is compared in relative frequencies of CVC firms and corporate-startup departments.

### **2.4.3 Startups operating in Germany**

The sources of financing of startups are reported in frequencies, as well as the (participation of startup support programs, main reasons to work with corporations, main concern to work with corporations and the time horizon for preferred startup cooperation). The mean and mode of capital received, and capital searched for funding are calculated and compared. The mean is calculated for the importance placed of startups, factors to accept an CVC investment, determinants to attend startup support programs, perceived investor market and the access to capital.

### **2.4.4 CVC necessity of startup cooperation**

CVC necessity of startup cooperation is analyzed with the help of a binary regression. The preferences of CVC or corporate-startup cooperation without investments is indicated by startups by a choice question of startups preference (*CVC, Corporate-cooperation without Investment*) and is tested by selected factors of (Importance of strategic synergies, importance of reputation, whether they are already VC or CVC funded, already cooperate with corporations, and their product stage and whether they are market ready).

The binary regression is a predictive analysis, intending to describe the relationship between the dependent variable and the selection of independent variables. The binary regression calculates the probability of the occurrence of an event over the probability that the event will not occur. The independent variables and their influence are regularly explained in odds. The normal logistic model  $p = \alpha + \beta x$  is not adequate as values do not fall between 0 and 1. The odds can be transformed by using the natural logarithm of the independent variables where  $p$  is the probability of the interested outcome and  $x$  the independent variable:



$$(1) \text{ logit}(y) = \ln(\text{odds}) = \ln \frac{p}{(1-p)} = \alpha + \beta x$$

We can derive from equation (1) the odds ratio as

$$(2) p = \frac{e^{\alpha + \beta x}}{1 + e^{\alpha + \beta x}} = \frac{1}{1 + e^{-(\alpha + \beta x)}}$$

Several requirements need to be fulfilled for binary logistic regression. The dependent variable has to be binary. The model should include only meaningful variables. The observations have to be independent with low multicollinearity. As a consequence, the independent variables should not be linear functions of each other. There is linearity required between the independent variables and log odds. The required sample size should be quite large, where small sample sizes might overestimate the effective measures.

#### **2.4.5 Ranking importance of startup characteristics**

The ranking of importance of startup characteristics, is calculated with the Friedman test. The Friedman test is used to test the statistical relevance of the ranking. The Friedman test is a non-parametric test to detect differences between means. The ranked responses are coded from 1 (not important at all) to 7 (very important) in SPSS.

## **Chapter 3**

### **3.1 Corporate Innovation**

Today, organizations are operating and competing in an increasingly complex and turbulent global environment (Friedman, 2005). Fukuyama (1992) describes that technology progress helped to flatten the world. Consequently, former factors responsible for competitive advantage, as location, financial capabilities, and human capital are accessible in many regions of the world and often become obsolete for permanent competitive advantage. These seemingly unique competencies are being commoditized in the global connected world (Chesbrough, 2011). Corporations have concerns with their competitiveness, reputation, expanded network of stakeholders and global visibility (Carroll, 2015).

In particular, large corporations have to constantly develop their business and create innovations to stay successful. Innovation is an essential part in business transformation (Schwab, 2017) and are a potential source of competitive advantage (BarNir, 2012; Sisodiya et al., 2013). Lee et al. (2012) state that innovation is the crucial imperative factor for organizations to build competitive advantage. The concept of innovation can be very general, as it can build up on scientific inventions, patents, technological breakthroughs, or even a simple new way of doing things. Closed innovation, solely based on intense R&D, can be slow and costly in the fast technology-driven environment. Establishing cooperation's is essential to compete in today's business environment, as only focusing on internal R&D is often insufficient (Pénin et al., 2011). Consequently, firms developed a different, more collaborative form of innovation, namely open-innovation (Lee et al., 2010). Open innovation is crucial for the success of many firms, as it tries to make use of all resources available, including cooperation with parties outside the firm (Mercandetti et al., 2017). Open Innovation is a medium to leverage, science, knowledge and learning (Creamer & Amaria, 2012). Mocker et al. (2015) express that cooperation of startups and organization is a form of open innovation, with positive effects for both. The fear and threat of corporations losing competitive

advantage and even become obsolete persuade them to cooperate with startups. (Kohler, 2016; Boyer & Blazy, 2014).

McGrath (2013) argues that in fast-moving industries, sustainable competitive advantage is very hard to attain. In consequence, corporations need to adjust to a fast-changing market and industry landscapes. Corporations and their various departments necessarily need to develop and improve their products and services to meet and create customer demand. Ansoff (1965) elaborates that organizations and businesses have recognized the need for finding new methods and paradigms to efficiently serve existing and new markets with new and modified products or services. Businesses and organizations are permanently driven by the changing global environment and seek for the most efficient models to maximize innovation management efforts (Christiansen, 2000).

Tucker (2002) states that the responsibility of innovation lies in all departments and business units and, additionally, their involvement. Dereli (2015) expresses innovation management as a regulated process of managerial activities of uncertain and complex structures to adapt to internal and external changes. Innovation are creation, identification and utilization of ideas, which can be largely responsible for the market success (Chatzoglou & Chatzoudes, 2018). Front-end innovations are one of the most critical areas of corporate management (Brem, 2009). Innovation procedure and origin differ for departments and the type of change. Factors of innovation can drive development and idea creation of corporations. Specific characteristics and fields are tending to use market or product-driven approaches often clustered in market-pull and technology-push activities.

Innovations decisions are tradeoffs, leading to different possible outcomes of management (Braga & Braga, 2013). Innovation can result from human creativity and ideas that satisfy needs and can develop unexpectedly from experiments. Oosterbeek et al. (2010) state that creativity, entrepreneurship and innovation are obtainable skills. The development of an entrepreneurial

mindset is subjects to education on mindsets, attitudes and emotional characteristics (Edwards-Schachter et al., 2015).

Kuratko (2016) expresses that innovation and creativity drives entrepreneurial culture. Merriam-Webster (2017) defines innovation as the introduction of something new or as a new idea, method, or device. Chesbrough et al. (2006) define innovation as ideas transformed into value. Furthermore, organizational value proposition and its changes influence innovation. Amongst others, value for organizations should mean to gain, maintain or create a competitive advantage. Therefore, any benefit created by innovation leading to competitive advantage for organizations should be of value. Persistent technological innovation lead to competitive success (Martin-de-Castro, 2015). Porter (2008) defines exploiting value by creating resources and value-creating actions, which are not met by their competitors, as a competitive advantage. Furthermore, the process of innovation and the creation of competitive advantage is based on human decisions. Those decisions are mostly complex and hard to evaluate, as the outcome is uncertain. Startups face uncertainty, whether their ideas will work, before market entry (Mercandetti et al., 2017). To illustrate the development of innovation, customer preferences of conventional values as price, quality, and service can be supplemented by the experience generated by the product. The experience and the senses generated with the product such as comfort, safety, care, and affection, create new value and have to be reconsidered for innovation (Lee et al., 2012). Innovating requires taking a risk and forgoing current returns in the hope of future ones. Uncertainty contains trial and error, aspiring value proposition and scalable business models (Brikman, 2015).

The market-pull innovation is based on market demand (Hansen et al., 2017). Brem (2009) defines market-driven innovation as a currently inadequate satisfaction of customer needs. It is resulting in new demands, by problem-solving action following the invent-to-order principle with impulses from individuals or groups communicating their subjective demand. Priem et al. (2018) describe

that through direct and frequent interaction of businesses and customers, digital innovation creates several business opportunities to respond to consumer needs. The technology-driven or technology-push is a stimulus for new processes and products that originate from internal and external research (Di Stefano et al., 2012), intending to make commercial use of know-now. The aim is to use and create knowledge and the new technical capability, which should fulfill or generate demand. The technology-push can be characterized as a creative form of innovation with further product improvements. Kohli and Melville (2019) express that the development of digital technologies, create new business models that aim to exploit these new cutting-edge technologies. The core argument of science and technology-push is that advances in scientific understanding determine the degree and direction of innovation (Nemet, 2009).

Gerpott (2005) in this context, makes a difference between high and low ‘newness’ of innovation and thus between radical innovations as technology-push and incremental innovations as market-pull. The difference between incremental and non-incremental innovation may underlie the market-pull and technology-push innovation approaches. The advancement of current technologies or products are characteristics of market-pull innovation, which usually develop incrementally. However, technology push often applies to non-incremental innovation. Freeman and Soete (1997) distinguish non-incremental and incremental innovation by involving new connections, discreteness and minor relatedness to existing products.

Criticism of technology-push innovation is, that it ignores prices and other economic conditions that affect profitability (Good, 2014). In contrast, market-pull innovation mostly considers economic conditions. The changes between innovation modes depend, to a large extent, on the degree of innovation. Greater innovations, which introduce new changes to existing technologies or business models, are usually based on non-incremental innovation often provided by technology-push. Radical innovation face high uncertainty in outcome and planning (Robbins &

O’Gorman, 2015). This can relate to long and intensive R&D processes responsible for a number of radical innovations. Those R&D processes can be very cost-intensive as the increasing importance of science in the innovation process increases complexity, uncertainty, and strong correlations between R&D and innovative output. The processes and the usability of technological possibilities influence the rate and direction of innovation. Ringberg et al. (2018) state that radical new technology is referred to as a driver of change.

Mowery (1983) argues that companies have to invest in science and knowledge to develop the capacity to exploit possibilities and opportunities from the state-of-the-art elsewhere. Babina and Howell (2018) state that R&D can create skills and ideas to establish new firms. Hence market-pull innovation explains incremental innovation more precisely, therefore typically not account for the most radical innovation. Demand “steers” firms to work on particular problems (Rosenberg, 1969). Dealing with innovation capabilities is the ability of companies to recognize “unrevealed needs” and their techniques to address and transpose those needs. Furthermore, the company’s willingness to deviate from the daily business routine to satisfy unmet demands. Furthermore, managers capabilities to be able to identify and see new opportunities drives innovation (Rydén et al., 2015). Hodgkinson and Healey (2011) describe that reasons of little radical innovations of established organization might be limited access to new resources, internal cultural traditions, legal requirements, resistance of management and managers mindset. The link between market-pull and technology-push is indispensable to describe innovation (Mowery & Rosenberg, 1979). However, both factors are not merely contributing; they also interact (Arthur, 2007).

The concept of entrepreneurship is defined by Schumpeter (1911) by different forms of innovation. Stevenson (2006) describes entrepreneurship as an approach to management, the pursuit of opportunity under consideration of resources currently controlled, defining six critical dimensions: the strategic orientation, the commitment to opportunity, the concept of resources, the concept of

control over resources, the concept of management and the compensation policy. Entrepreneurs need to attract resources and show evident progress in limited time frames as they often have only a short window of opportunity.

Corporate entrepreneurship is “the sum of a company’s innovation, renewal and venturing efforts” (Zahra, 1995). Sahut and Peris-Ortiz (2014) state that for researchers’ entrepreneurship and innovation are interconnected. It is found to be an option to improve competitive positioning, business transformation and markets due to value-creating innovation, developed and exploited.

Eisenmann (2013) differentiate four types of opportunities: 1) pioneering a truly innovative product; 2) devising a new business model; 3) creating a better or cheaper version of an existing product; or 4) targeting an existing product to new sets of customers.

Kahn (2018) distinguishes innovation in three different categories. Innovation is an outcome, a process, and a mindset. The outcome innovation is the actual result of product, process or business model innovation.

Process and product innovation distinguish in the degree of innovation and impact on competitiveness (Un & Asakawa, 2015). Process innovation helps to improve efficiency, product specifications and quality (Stadler, 2011) and mostly refer to internal improvements (Pisano & Shih, 2012). The process of innovation is the way and structure of an organization to realize innovational results. The mindset relates to the way of thinking and behavior of a supportive organizational culture for innovation. In order to establish competitive advantage for the long run, performing different forms of innovation, as combining product and process innovation, is necessary (Damanpour, 2010). Different types of product innovation are possible. Product improvements relate to new functions and forms of replacing existing products. A modified version will exchange the present product. Line extension are existing products modified by new functions,

that current products do not offer. The differences in product innovation are that the existing products are still available.

Innovation regarding efficiency can reduce costs of production processes, supply chain, and all kinds of business areas. The existing process is improved to reduce costs. As a result, the profit margin rises and enable companies to reflect the cost-saving in a price reduction of the product offered. New market innovation relates to current products, where minimal changes are introduced in novel markets. In contrast, new category innovation refers to products that are new to the company.

The most radical form of innovation is disruptive innovation. Disruptive innovation is described by Shane and Venkataraman (2000) as an entrepreneurial opportunity, which is more progressive compared to incremental innovation. The concept of disruptive innovation and entrepreneurship includes risk and uncertainty. McMullen and Shepherd (2006) describe uncertainty as a fundamental component of entrepreneurship. Risk can be anticipated and is calculable, whereas uncertainty is unknown (Miller, 2007).

One has to differentiate between disruptive product innovation and disruptive business model innovation. The expression of business model refers to the theoretical concept, of way firms, produce and capture economic value (Osterwalder & Pigneur, 2011). The business model innovation refers to impactful changes in business models of existing products and services, establishing and redefining the manner of how the product is brought to the customer. The disruptive product innovations are new products which did not exist, associated with relevance and value to customers influencing their behavior (Markidis, 2006). The different opportunities for corporations and current market situations with resource availability influence the desired outcome of innovation.



Organizational innovation tends to be resource-driven as more resources are acquired. (Stevenson, 2006). This finding suggests that large corporations, base their innovation on their resources and are not opportunity-driven. In the second half of the 1980s, the large American Organizations tended to be large complex business organizations, with the reputation of being inflexible, bureaucratic, inadequately innovative and slow to adapt. Additionally, the criticism against those large organizations increased to diminished capabilities to manufacture high-quality goods (Burgelman & Sayles, 1988). Abernathy and Utterback (1978) argue that some setbacks of organizations result due to the logic of technological development. The exploitation of existing technologies could structurally impede the development of new ones.

The technological fundamentals change, and therefore new approaches, the development of new products and strategic repositioning become essential. Industrial renaissance can let to the belief that for large organizations, new product technologies and innovations can again become tools for creating a competitive advantage (Burgelman & Sayles, 1988).

Corporate innovation initiatives about startups are versatile. Startups are often innovation drivers and challenge existing products and services (Adelino, et al., 2014; Gimenez-Fernandez & Beukel, 2017). Today's business environment in relation to corporate innovation is largely affected by technological scope and startups. Chesbrough (2003) states that the knowhow to innovate is mostly present outside the corporate boundaries. Corporate entrepreneurship refers characteristically to novel business creation and innovation of an organization (Block & Ian, 1993).

The differences between corporate entrepreneurship and startups are multifaceted. The corporations usually characterize resources, scale and routines to operate an existing business efficiently, whereas the startups are missing these properties. In contrast, startups tend to have promising ideas, agile and flexible organizational structures, willingness to take risks and aspire growth (Skala, 2019).

Conceivably, startups can use their temporal advantage and establish their brand and grow in the market. However, as startups mature, their processes get more complex just as their innovation process. In consequence, the growing startup may fall victim to the very problems that generated its initial advantage (Freeman & Engel, 2007).

Theoretically, both worlds would profit from the great potential of synergies, but there are several challenges to align benefits from startups and corporations. Aldrich and Auster (1986) state that startups face less responsibility. However, they face the liability of newness and smallness (Dahlander & Gann, 2010). The liability of newness and smallness limit the reputation, resources, knowledge, and network of the startups (Freeman & Engel, 2007). Stinchcombe (1965) describes a higher risk of failure of small and new firms results of missing market legitimacy, less stable internal structures, working routines and the incapability to compete with more established firms. Parida et al. (2012) express that small firms benefit more from open innovation, through better adoption of changing businesses and lighter organizational processes. Manso (2011) describes that innovation are experiments that often fail, which require organizational tolerance for short-term failure for success in the long run.

Corporations typically build their innovation on specific characteristics, as they have usually more capital, larger R&D departments, more brand presence, better strategic alliances and complete business processes. However, corporations struggle with the termination of projects, thereby provide rational for being comparable advanced at incremental improvements (Kerr et al., 2014b). The given chances and capabilities of innovation are often absorbed by existing industrial structures (Freeman & Engel, 2007). Riskier innovation possibilities are prone to more inconsistencies in organizations and are often better located outside the firm (Fresard et al., 2017). Phillips and Zhdanov (2012) state that many high-risk companies benefit from the strong incentives available in small firms, in joint ventures or financed by external capital.

Lechner and Dowling (2003) suggest that cooperation between startups and corporations might help to create business synergies and positively impact business operations. Startups could profit from the resources, market power, facilities of corporations and furthermore from information and knowledge shared about their organizational processes (Lechner et al. 2016). Corporations, in contrast, can profit from the agility, flexibility, and innovativeness of startups. They can benefit from startups' innovational performance (Markovic & Bagherzadeh, 2018). Through external cooperation of startups and corporations, both sides could benefit from the exchange of resources, knowledge, and capabilities. They can integrate or combine resources, which may create synergies and innovation.

The risk of opportunism can result out of the cooperation, as different parties acting in their self-interest (Bouncken & Kraus, 2013). The cooperation between startups and corporations is often unbalanced due to newness, size, and lack of resources to manage business dynamics (De Rond & Bouchikhi, 2004). The startups are regularly exposed to the market power and scope of corporations (Lechner et al. 2016), which can lead to low negotiation power, dependency, and possible loss of control (Ketchen et al. 2007). The dependence of startups should be reduced by establishing more partnerships with different corporations.

Corporations are hard to approach for startups, as cultural differences and asymmetric goals subsist (Hogenhuis et al., 2016). Managerial incentives in corporations are generally not designed for demanding and promoting innovation. Beyer et al. (2011) argue that managers invest too little into R&D due to reasons of possible project failures, leading to decreased compensation or even job loss. However, corporations increase their external involvement and cooperation with startups and innovative communities (Chandra & Yang, 2011; Kanbach & Stubner, 2016). Top management of corporations influence the degree and success of knowledge sharing in an organization (Nguyen &

Mohamed, 2011), as sharing expertise and know-how is important for successful innovation (Chiang & Hung, 2010).

Despite top management is accountable to their external stakeholders, the owners of the company, and their employees. The different strategies of startup cooperation of corporations are versatile, offering diverse programs and ways to engage with startups.

The innovation process starts with an idea and develops into new or improvements of technologies, products or services. Freemann and Engel (2007) distinguish between corporate innovation and entrepreneurial innovation, referring innovations in mature and larger organizations and entrepreneurial firms recently started. Firstly, resources underlying the innovation have to be mobile and must be able to change the existing deployment of resources. Secondly, the incentives of stakeholders must be aligned. If one of these requirements is not met, the innovation process slows down. Time is a crucial factor in gaining competitive advantage and essential for the success of innovation.

The strategic alignment of the corporate and startup has to be set, including both sided commitment from the top management. The expectation management has to be anticipated, as corporations tend to be slow, and startups might overestimate their working capacity. Cooperation needs to manage and occupy the resources of both parties. Deeds and Hill (1996) find diminishing returns in relation to advantages and access to complementary resources.

Moreover, helpful for overcoming arising problems during cooperation, frequent top management steering committees could be implemented to ensure commitment on both sides.

Weiblen and Chesbrough (2015) describe three capabilities that need to be considered by corporations for successful startup innovation. Firstly, corporations have to create resources and capabilities to screen, identify, work, and monitor more substantial amounts of startups. This is related to the globally growing startup ecosystem. Secondly, the value offered by corporations to

startups has to be clarified and created as startups already have access to VC firms, incubators, and other support programs. Thirdly, a clear vision should be defined, what the corporations want to achieve with their startup engagement. On that basis, the different cooperation models should be chosen.

Several corporations established innovation departments, focusing on digital innovation and startups, in external environments to develop and find innovation (Sindemann & von Buttlar, 2018). Dependent on their aims, there are several different ways cooperation forms for startups and corporations (Alänge & Steiber, 2018). The aim should predefine what kind of cooperation modes would be suitable to establish their needs.

Established organizations make use of structured programs to create entrepreneurial power (Horn, 2014). The ecosystem of startup supporting systems seems to be growing and several corporate cooperation programs as corporate-startup departments, startup incubators, co-working spaces, and CVC units are originated.

## **3.2 Incubator**

An incubator is often understood and defined as a medium of organizations to create an environment that supports and advises new firms in their development (Chan & Lau, 2005).

There is no clear definition of incubator programs (Phan et al., 2005), as the developed structure can have different characteristics regarding the focus of startup development stages (Bergek & Norrman, 2008), technological areas and resources available and provided. Organizations test different ways of managing and setting up accelerators (Kohler, 2016).

Becker and Gassmann (2006a) define incubators by having the strategic mission to support young enterprises for technological development through the provision of physical resources.

Rubin et al. (2015) emphasize the importance of technology business incubators, by building a bridge between failures of new ventures and enhancing access to capital. Incubators and accelerators offer advice, financing and business services to help startups to launch their business with a probability of greater success (Radojevich-Kelley & Hoffman, 2012).

There are two different forms of corporate incubators, engaging in internal ideas developed by corporate employees or externally for startups. The inside-out corporate incubators are internally developed technologies or business models, which are not fitting under the organizational structure or able to develop in the corporate environment. The corporation supports the business idea with corresponding mentoring, expertise, and firm specific resources (Moschner et al., 2019). The idea is to provide a startup environment for the founding team, where fewer organizational obstacles prevent business development (Weiblen & Chesbrough, 2015). This section, however, focuses on corporate incubator programs for external startups.

In relation to incubators, accelerator programs exist. Accelerator programs support startups and help to define products and services, identify customer segments, and offer resources for development, typically including some seed capital (Cohen, 2013). Accelerator programs are usually limited in time and vary across corporations. Accelerators provide entrepreneurs with the essentials and experience necessary to be successful (Hathaway, 2016). To align incubator programs to this study, we defined the capabilities commonly used by corporations and what they typically offer startups. Corporate incubators and accelerators are departments offering support for startups with promising business ideas or technologies that often align with the overall corporate mission, with the aim to generate value to their business and strategic goals (Becker & Gassmann, 2006b).

The corporate incubator should close the gap of early-stage startups and their product readiness. The products and ideas of startups are validated and challenged by corporate incubator programs.

Incubators often follow the strategy to develop and enhance startups existing product and service to a stage, usable and qualified for pilot projects (Hochberg, 2016). This definition aligns with the conclusion of Brooks (1986) that incubation should aim to help to develop ventures to the “attempt stage”.

The tools and support often offered by corporations are free shared office space, business support, and the availability of the internal and external networks.

Startups can profit from the infrastructure provided to validate their business models, products, and services by industry experts and on existing use cases of corporations. Corporations might provide resources, technical equipment, and access to corporate customers and, open up, corporations' distribution and supply advantages by leveraging their long-term relationships and reputation (Caves & Porter, 1977).

Attending in corporate incubator programs might create media attention and visibility of startups and attract other potential customers and investors. The experience gained in corporate environments, and product validation may enhance learnings for startups about products, operations and corporation's business practices, which might be of value for future operations. Besides, startups might use this potential and attract corporations' interest and gain a large customer.

However, participation in incubator programs might prevent startups from pursuing partnerships with corporation's competition (Weiblen & Chesborough, 2015). The corporations may profit from new ideas, pre-developed products, and services that may add value to the parent's business. The incubator should give insights to new technologies, products, and startup working behavior, so encourage corporate innovation.

There can be several indirect benefits associated with incubators. The corporations may be able to attract talent from startups and increase internal visibility to help corporate employees to increase

their internal network and reputation. Additionally, attention on incubators and their existences can create interest from R&D departments, which might be inspired, motivated or even fear results from startup cooperation. Access to external know-how can leverage internal R&D efficiency to pick up external ideas and knowledge (Allen, 1986).

A successful incubator combines the capabilities and scale of large corporations with fast decision-making and entrepreneurial spirit of startups (Kohler, 2016).

Despite the mixed arguments and unclear evidence, corporate incubation has become an established medium to commercialize corporate innovation.

Dee et al. (2011) describe that originated by the provided resources of incubators; participation is positively associated with startup survival and growth. This condition is especially met by corporate incubators (Weiblen & Chesbrough, 2015), where valuable resources can be shared in the corporate environment.

### **3.3 Startup Challenges and Pilot Projects**

Startup challenges are often specified problem statements of corporations, that need or want to be solved. The provided problem statements are open for application for possible solutions from startups. The information is used to specify and customize their solution to the given and predefined problem, where corporations evaluate the results. Typically, there are prizes associated with the winners of the challenge, varying from prize money, funding, or guaranteed pilot projects. A typical corporate challenge method is a corporate hackathon, which is a timely restricted task-positions to solve by different startups as predefined corporate innovation challenge (Newton, 2015).

Briscoe (2014) finds that the participation with non-technical background increased within hackathon participation. Teece (1986) argues that the principal benefit of cooperation is the



exploitation of complementary assets, which could be, e.g., intellectual property and manufacturing expertise. Therefore, pilot projects can be suitable to test the potential synergies. Pilot projects could result out of accelerator and incubator programs, where results are tested in the corporate environment (Serwatka, 2018). A favorable precondition for successful pilot projects could be an identified challenge by corporations.

The necessary resources and commitment of the corporations should be provided. However, it's a very loose partnership, where often no predefined structures are given. The startup, in return, can test and validate its product and learn from challenges arising by working with corporations (Freytag, 2019). As a successful project might turn into a business relationship, where the startup has the chance to gain a long-term customer or build up a strategic partnership. The effort and risk associated with piloting projects often seem decent as unsuccessful projects and partnerships can be terminated without much effort and costs. Therefore, risks and resources of projects should be able to be assessed in advance.

### **3.4 Pre-evaluation Capabilities of Corporations**

For startup cooperation, pre- and post-evaluation phases have to be distinguished. The process of pre-evaluation is identifying targets and technologies for investing or potential partners. The different technologies and potentials have to be evaluated in order to understand the context and being able to evaluate targets.

At the very beginning, the strategy and goals have to be defined by corporations to set the right key performance indicators (KPIs) for the strategic purpose of CVC investments and startup selection.

One challenge for successful cooperation is the development of predefined performance measurements (Zhang, 2017). The measurement of innovations is important for organizations, as it is difficult to control something that is not measured (Rejeb et al., 2008).

The different strategies represent the overall focus of CVC and startup cooperation. The understanding and defined shareholder interest have to be considered to determine the objectives and goals of investments and cooperation. The next step is to ensure that adequate human and other resources are employed, able to fulfill the task of understanding existing technologies, market capabilities, and potential of investments. Campbell et al. (2003) state that in order to avoid the loss of focus, venture units need to have clear objectives, in terms of the sectors investing in and working with, in order to be able to assess the balance of financial and strategic goals. The state of current and potential new technologies has to be recognized by CVC and corporate-startup departments. There is a need for excellent industry knowledge to evaluate market potential and startups' capabilities to successfully cooperate and invest in startups.

### **3.5 Scouting**

Search for internal and external knowledge outside the boundaries is essential for the innovation of organizations (Wang & Quan, 2019). The research of Arnold (2003) and Christensen (2013) show that incumbent firms are threatened by discontinuous technological change, as they tend to react slower than smaller competitors. Moreover, Lucas and Goh (2009) show that awareness of technological change does not necessarily enable the right actions.

The challenge of scouting is to identify, anticipate, and assess discontinues change (Levinthal, 1994), new opportunities, and trends. Technology scouting refers to the scanning of a company's resources and capabilities as well as the acquisition processes for innovation (Wang et al., 2015)

and possible threats. The aim is not to provide detailed technology features, moreover it should create insights and patterns of change in the external environments (Parida et al., 2012).

One aim of scouting is to identify market potential, business opportunities, and technologies at an early stage. The results and outcome of scouting can be different, as a direct benefit of identified technologies and startups should add value to corporations existing business. Moreover, solving existing problems with new technologies (Winters & Murfin, 1988), and complement internal R&D (Kim & Sohn, 2020). Those created synergies are considered meaningful as they may increase efficiency and reduce overall costs (Siegel et al., 1988). Another aim is to identify technologies, which can impact corporations current business models or products in the future. Those technologies can have an impact on the overall market situations. Disruptive technologies may enter and expand emerging market niches, develop, and target established products in their traditional markets (Christensen, 1997). These technologies have to be identified by corporations, to be able to adapt and react to competition and possible threats.

This process might set off new ways of thinking and enable corporations to develop new products, technologies as possible replacements of existing technologies to be prepared for shifts in business and market situations (Chesbrough, 2002). Moreover, Wang and Quan (2019) express that in times of high uncertainty as firms are able to mitigate risk by searching and using external technology instead of internal R&D. The optimization of execution of corporations existing business model, could interfere their awareness and searching activities apart from core business and by that lead to missed venture opportunities (Chesbrough, 2014). The capability to use external know-how can guide firms to succeed under open innovation (Xiaobao et al., 2013).

### **3.6 Network**

Ecosystems, with formal and informal relations, are of great value to exchange information (Padilla-Melendez et al., 2013). The network for CVC and corporate-startup departments is essential and needs to be developed and maintained externally and internally.

External network of corporations regarding innovation can be crucial to identify, sharing the experience with other corporations, and establishing external partnerships. Those contacts can generate business opportunities (Winters & Murfin, 1988) and help to validate opportunities and threats. Forming external partnerships, is one of the priorities for success of startups (Pangarkar & Wu, 2012). The primary objective is to establish a network, consisting of a broad set up of several possible partnerships with, e.g., universities, VC firms, consultancy firms, other corporations, and governments, dependent on their needs and aims.

Several startup companies are offering specialized startup scouting to develop or support corporations' startup programs. In order to get access and validate identified startups, corporations can make use of their network. The network should enhance the quality, access to technology and increase their own visibility in the market.

The visibility and position in the market can enhance corporations' reputation. The increase of reputation could attract other potential business partners (Poser, 2003) and potential talent (Weber, 2005). CVC and startup cooperation could create the possibility to shape corporate image by introducing social entrepreneurship programs or investing in environmentally friendly technology.

The internal network is besides of great importance, as identified startups and innovations have to be spread into the organization. The impact, which can be generated by technologies found, is

relevant for specific business fields with corresponding business units. Therefore, CVC and corporate-startup departments need to cultivate close relationships with business units and their functional departments and establish fast and easy communication to manage innovation efficiently. Strong internal and external relationships to the parent company's business units should be important for CVC success (Hill & Birkinshaw, 2014). The functional departments should have the experience and expertise about current technologies and know the practical problems.

Moreover, the corresponding functional department is often responsible and should be able and impact the validation of technologies and products. Therefore, close relationships of ventures and business units have to be established, to guarantee knowledge transfer (Dushnitsky & Lenox, 2006). Substantial fear of new technologies in corporate departments can increase the difficulties of integration. Moreover, corporate departments have yearly planned budgets and resources to fulfill their tasks, leading to extra effort and risk for middle managers to engage in innovative projects.

Companies that establish strong networks can learn from different technological expertise through cooperation and are more familiar with organizational structures and dynamics (Rycroft, 2007).

### **3.7 Ecosystem**

New products and technologies may need particular infrastructure or materials for developing and producing new products. Therefore, investments and developments in complement products might be necessary for the success of the core-product. Corporate-startup cooperation can grant access to a complete new entrepreneurial ecosystem (Drori & Wright, 2018). The access to the new entrepreneurial ecosystem can be used to learn and adjust firms operational and business model

(Steiber & Alänge, 2020). Frenkel et al. (2015) state that ecosystems with different technologies stimulate the creation of startups.

The goal is to establish an ecosystem of suppliers, strategic partnerships with complementary businesses to create and increase demand for core products or services (Chesbrough, 2002). Moreover, the traditional markets might lack competency or necessary funds from VC to develop the required infrastructure (Campbell, 2003).

Innovations success is dependent on several different factors as e.g. resources, management alignment and timing that need to be combined. Lim et al. (2018) state that the interconnection of factors needs to be combined in order to create value, as a missing factor might interfere the ecosystem connection and impede innovation.

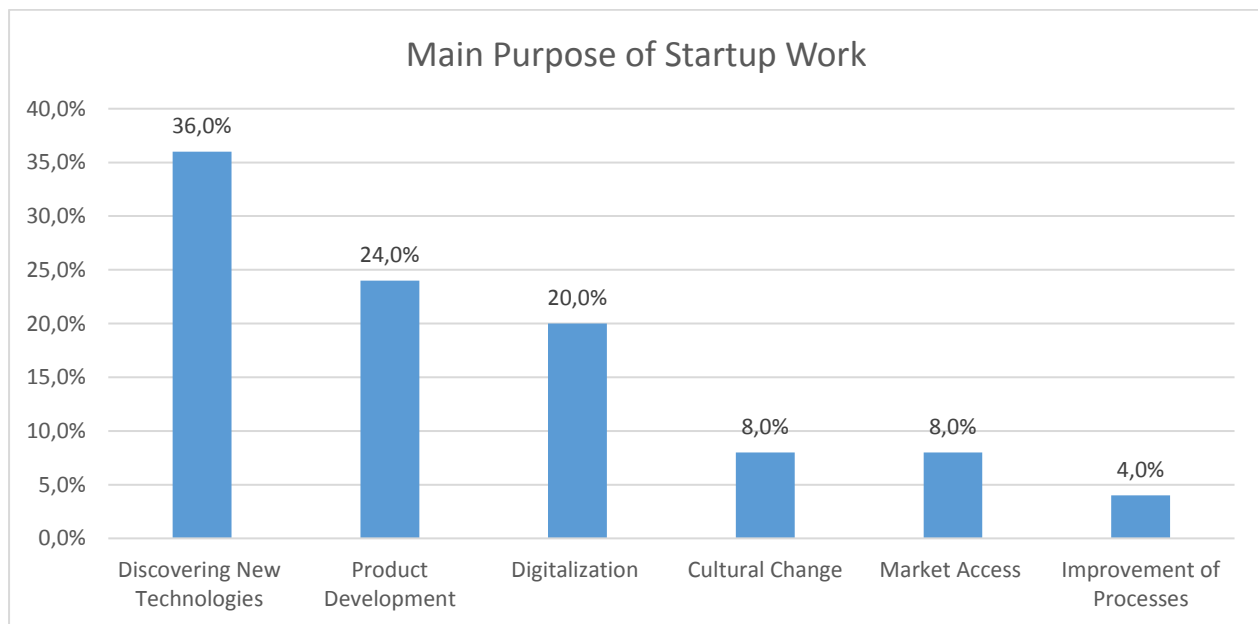
A practical example are electric driven cars, which are only convenient for large customer groups, as long as the necessary charging infrastructure is developed and established. Moreover, the source of electricity plays a significant role in their Co2-Footprints. Therefore, automobile industries have to evaluate complementary businesses to set the preconditions and raise the attractiveness of electric cars. Duschinsky and Lenox (2006) find that investments in complementary products can increase demand for the core business.

Those investments can be costly and are only worthwhile if corporations can substantially gain stimulated market growth (Chesbrough, 2002). In this context, the charging infrastructure of electric driven cars is targeted by a strategic partnership from the German automobile industry to create the corresponding infrastructure.

## Chapter 4

### 4.1 Analysis of Corporate-Startup Departments

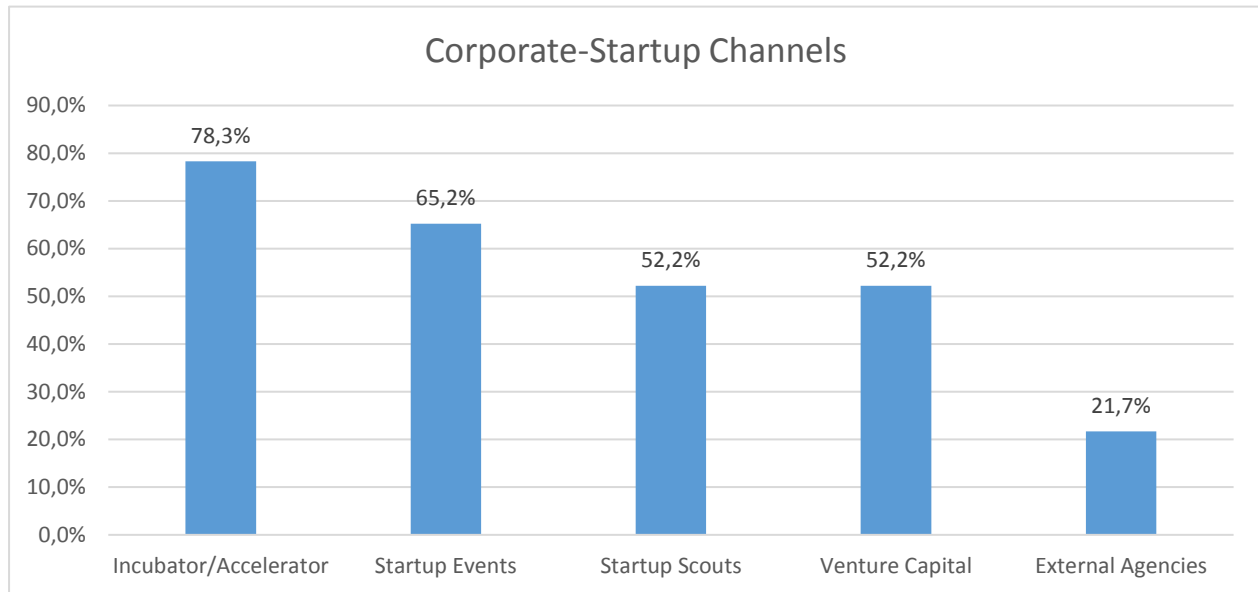
The literature shows relevant factors of external innovation for corporations to sustain competitive advantage. Furthermore, experience made at Volkswagen indicates several challenges to overcome. The organizational structure and resources are of importance in relation to successful startup work. The survey gives an overview of how German corporate-startup departments operate and what their focuses and purposes of startup work are.



**Figure 1.** Main Purpose of Corporate-Startup Work

The main purpose of the different corporate-startup departments is dominated by discovering new technologies 36%, product development 24%, and digitalization 20%. Also, some corporate-

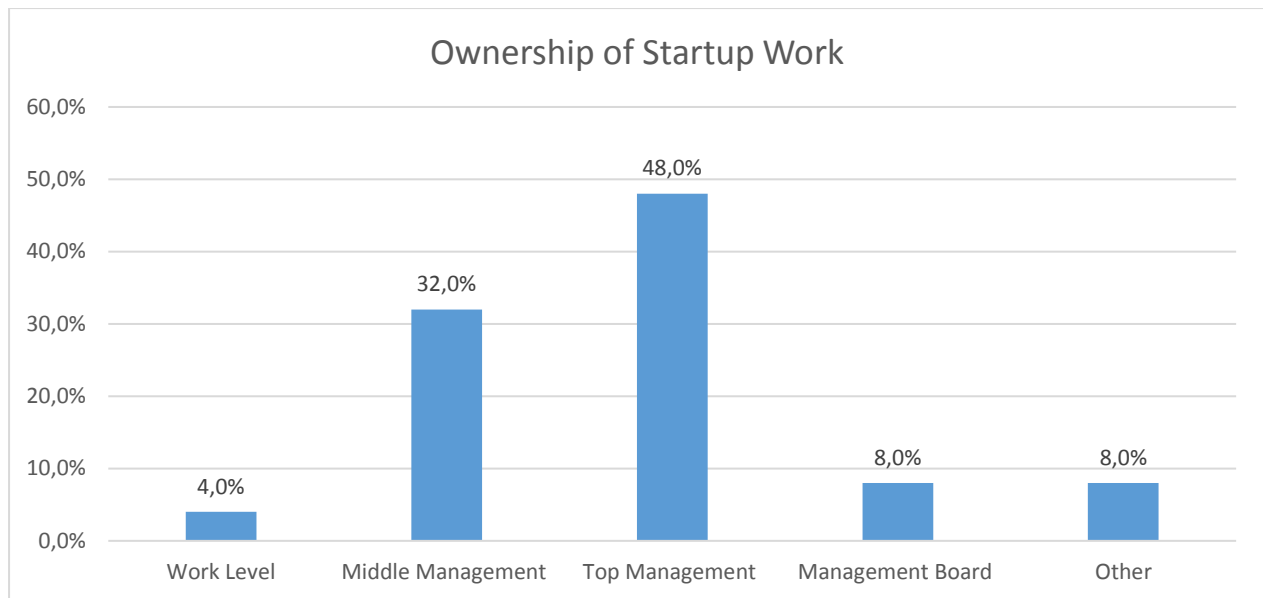
startup departments indicate their main purpose as cultural change and market access both 8% and improvement of processes 4%.



**Figure 2.** Corporate-Startup Channels

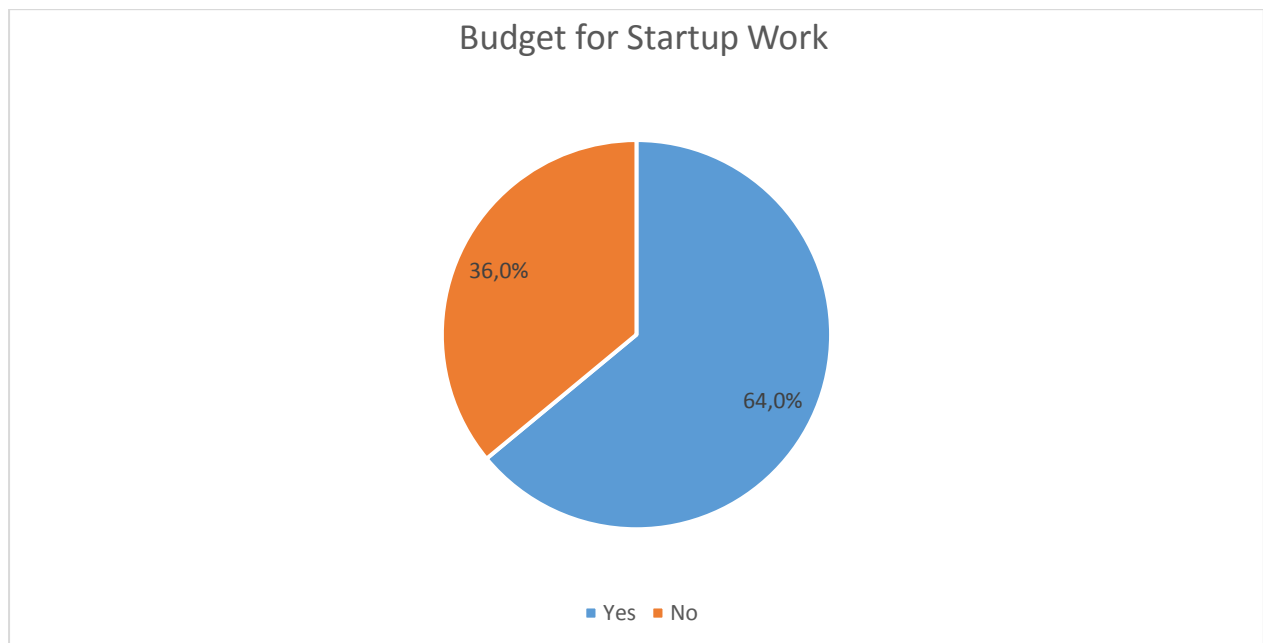
The corporate-startup departments engage in various ways and established several channels to work with startups. The majority of corporations offer incubator or accelerator programs accounting for 78.3% of the cases. To establish contact with startups and the ecosystem, 65.2% of corporate-startup departments attend startup events or employ specialized startup scouts 52.2%. Minority investments into startups through VC is used by 52.2% of the corporations. Additionally, 21.7% of corporations work with specialized external agencies to demand and promote startup engagement.





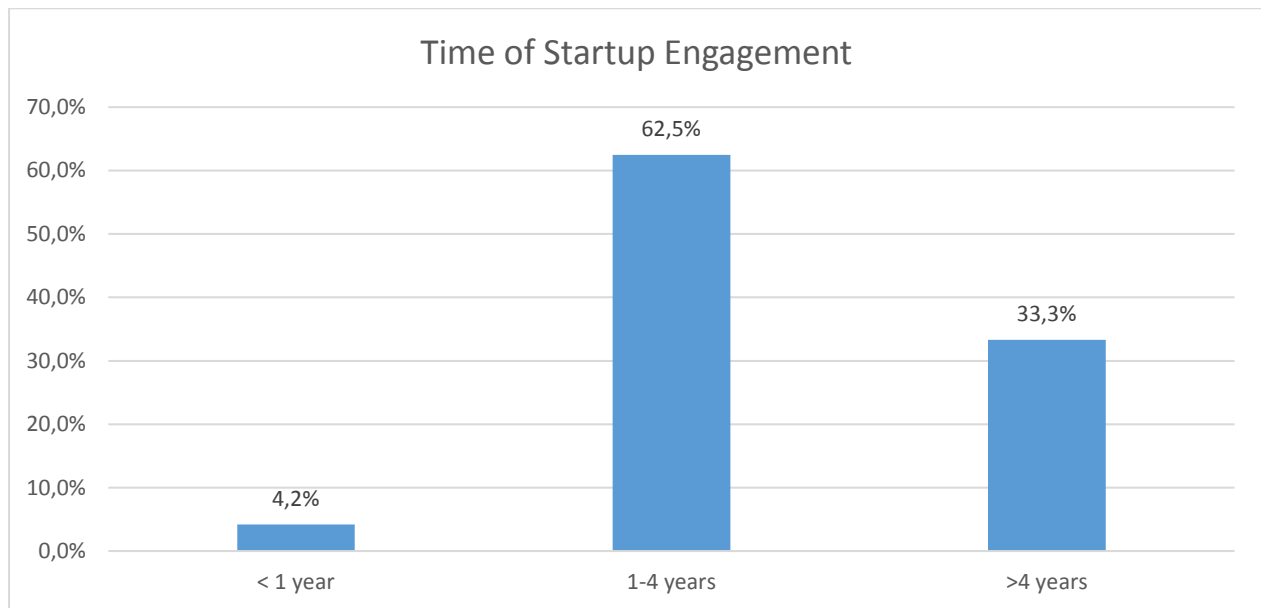
**Figure 3.** Ownership of Startup Work in the Organization

The ownership of control of startup work distribution across corporate-startup departments shows that the majority of ownership is associated to top management 48% and middle management 32%. Only 8% indicate ownership of control by the management board and others. Only one startup department 4%, has ownership of control at work level.



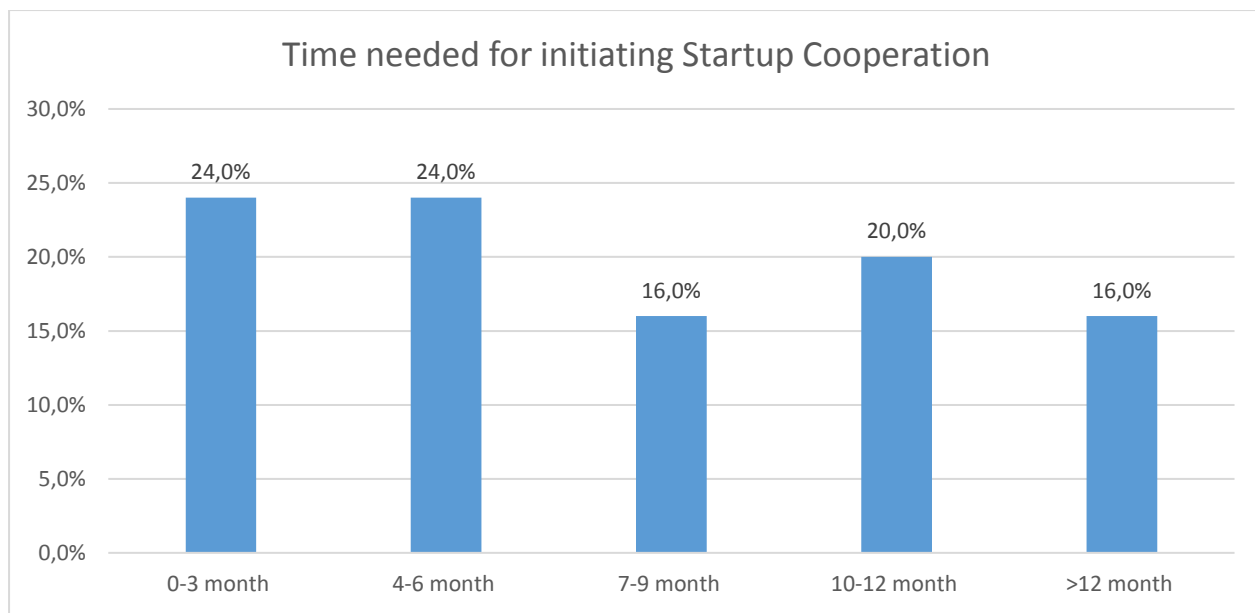
**Figure 4.** Budget for Startup Work

The majority with 64% of corporate-startup departments have an explicitly planned budget for their startup work, and 36% do not.



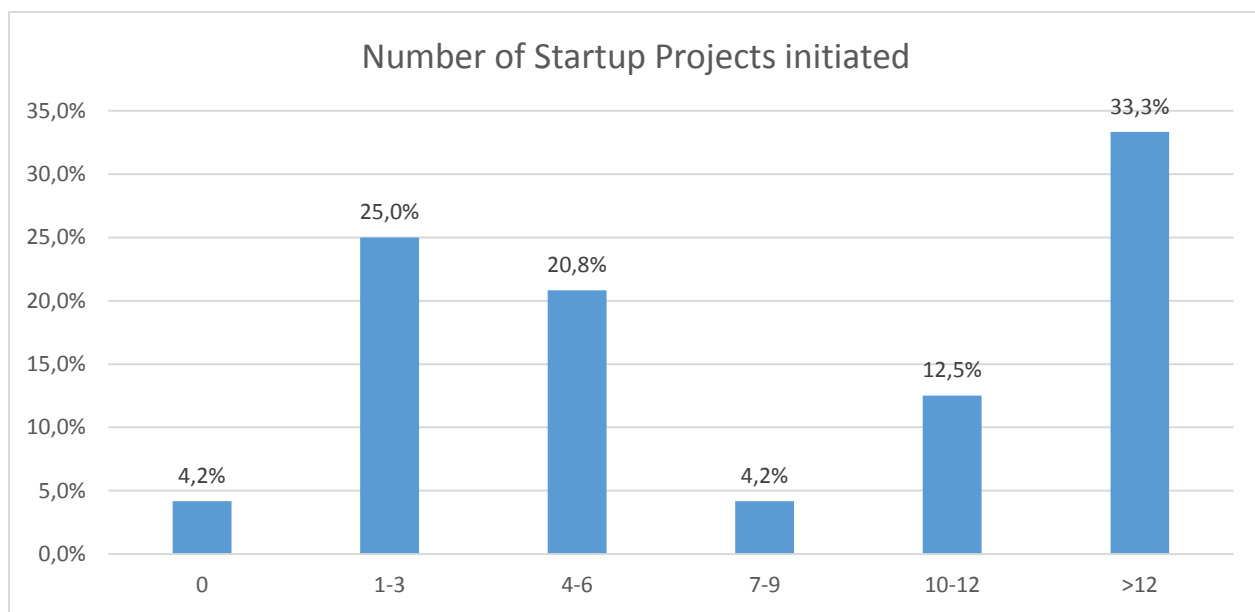
**Figure 5.** Time of Startup Engagement

Fig. 5 shows that the majority of 62.5% of departments working with startups between 1-4 years. There is a substantial amount of German corporate departments with 33.3% working longer than 4 years with startups, and only 4.2% corresponding to one department just recently started.



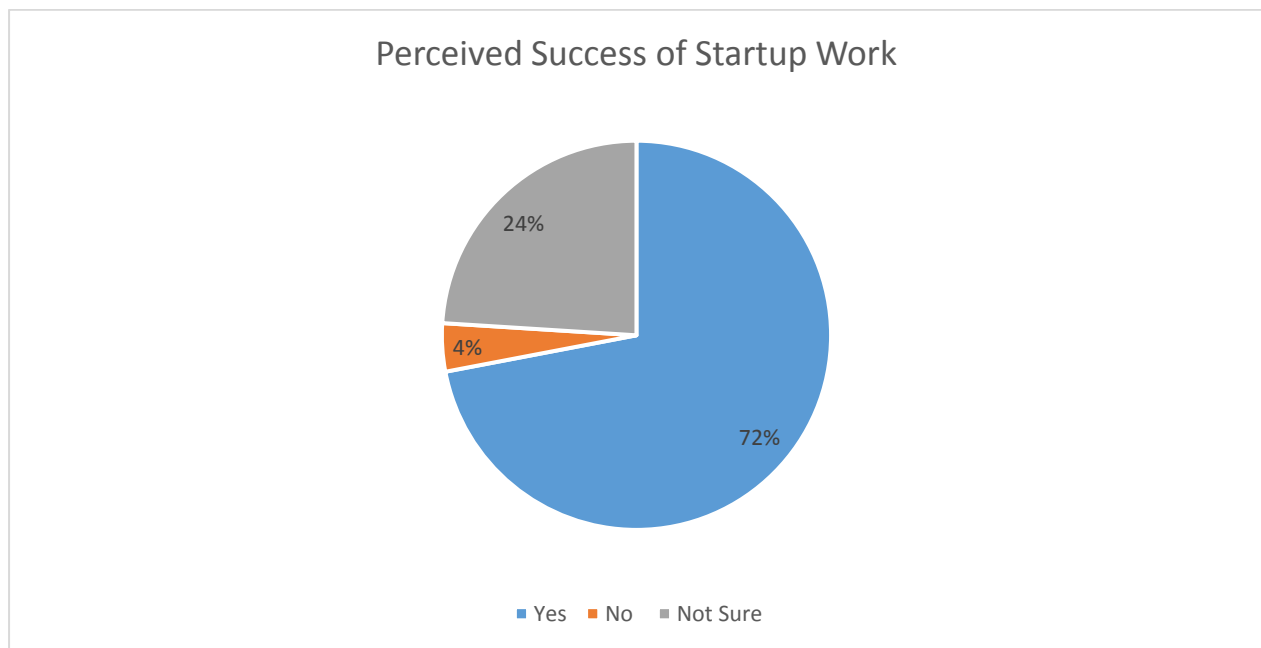
**Figure 6.** Time needed for initiating Startup Cooperation

Fig. 6 shows the different time horizons corporate-startup departments need to initiate startup cooperation. The most prolonged period is over 12 months, accounting for 16% of the corporate-startup departments, 20% between 10-12 months, 16% between 7-9 months, 24% between 4-6 months, and 24% between 0-3 months.



**Figure 7.** Number of Startup Projects initiated

The startup projects initiated so far by German corporate-startup departments surveyed show that 33.3% initiated 12 projects, 12.5% between 10-12, 4.17% between 7-9, 20.83% between 4-6, 25% between 1-3 and 4.17% no projects. There are different forms of startup projects, and each department may define those differently. As a consequence, Fig. 7 only indicates the activity of corporate-startup departments and does not provide any real comparability.



**Figure 8.** Perceived Success of Startup Work

The individual assessment of their startup work is perceived by the majority 72% of the startup departments as a success. There are 24% who are not sure, and 4% regard their startup work, not as a success.

## Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Higher Startup Budget	25	1	7	4,32	1,435
Higher Ownership of Innovation	25	2	7	4,80	1,323
Lower Hierarchies	25	2	7	4,16	1,491
Lower Administrative Hurdles	25	1	7	5,16	1,625
Lower Resistance of Workforce	25	1	7	4,32	1,842
Valid N (listwise)	25				

**Table 1.** Importance of Corporate-Startup Departments for Future Improvements

Table 1 shows the importance of further improvements for better startup work. The highest importance is associated with lowering the administrative hurdles in corporations with a mean value of 5.16. Higher ownership of innovation is valued with 4.80, followed by higher startup budgets 4.32, lower resistance of the workforce 4.32, and lower hierarchies 4.16.

## 4.2 Discussion

The survey shows descriptive statistics of German corporate-startup departments. The image of startups as innovative and source of technological advancement, lead corporations to try to cooperate with startups as drivers of corporate innovation (Weiblen & Chesbrough, 2015). The purposes of corporate-startup departments are mainly focused on discovering new technologies and the development of products. This may imply that corporate-startup work is aiming for more radical innovation. Barley et al. (1993) find that the most common motivation for cooperation is technological development. This aligns with the study of 500Startups (2017) surveyed 100 corporate executives' cross industries in the U.S, Europe, and Asia. Younis et al. (2017) find that most startups engage with startups to find new technology 92% and to execute transformation 52%. Moreover, the study finds the way corporations engage with startups are pilot projects 77%, direct

investments 60%, and acquire startups 48%. The channels used to engage with startups were accelerators 59%, events and startup challenge 56%, external startup offices 44%, and investing in VC fund (36%).

Essential for new entrants is to increase startups' visibility and attractiveness of corporations, which may be associated with the first-mover advantage of new product developments (Schoonhoven et al. 1990), and new technologies (Rothaermel, 2002). This aligns with the results of the purpose of the German corporate-startup departments in Fig. 1. The corporate-startup departments established and place great importance on incubator and accelerator programs. Corporations seem to become more entrepreneurial, launching, and suspending corporate entrepreneurial activities, like CVC and incubators. Interestingly, 50% of corporations use VC as a medium to cooperate with startups. However, there is no clear distinction in the study made between own CVC funds and investments in independent VC funds.

The longer the corporation engages actively in startup work, the organizational learning and internal reputation of the organization should be established. Jiménez- Jiménez and Sanz-Valle (2011) find that organizational learning, innovation, and performance are positively related. The majority of departments engage in startup work for 1-4 years. This may not appear as a long-time horizon in order to gain experience, build up internal and external startup networks and reputation of corporation's startup work. The fixed budget enables corporations to act fast and respond to opportunities. However, fixed budgets might lead to misspending, as the budget is planned yearly and typically will be reduced by management, if it is not needed. On the other side, if departments do not have a fixed budget, decisions may take longer as the sufficient funds need to be organized and released. The requests of funds could be time-consuming and may slow down processes and cooperation.

The corporate-startup departments specify their number of projects initiated so far in Fig. 7. The statistic shows large variations for the number of startup projects initiated with 33,3% of the startup departments undertaken more than 12 projects. This statistic does not imply whether those projects were successful or resulted in any value-adding commercial deal. The majority of corporations in the study of 500 startups in (2017) state that less than 25% of their initiated pilot projects turn into projects scalable for commercial use of the corporate (Younis et al., 2017).

Hellmann and Thiele (2015) argue that tolerance for failure of corporate innovation is essential to create incentives and promote innovational activity. The compensation structure pay-for-performance might contradict innovational action (Manso, 2011).

The ownership structure of startup work shows different levels of responsibility, demonstrating that there is no consistent reporting structure among corporate-startup departments. The ownership of the startup work ranges from work-level to management board. One of the success factors identified by a study of Capital and Infront in (2017) for corporate-startup programs in Germany is the top management support of startup work (Kreimeier, 2017). As startup work might be relatively new and uncertain, it often requires resources, approval, and support of a top executive of the corporation. High ownership of startup work might provide startup departments with the necessary legitimization internally and enable working processes with several organizational areas. Fast decision making and short time frames are important for innovation and hence, for startup cooperation. The necessity of fast operation seems to make the time horizon of initiating startup projects an important factor to success. Rapid product developments create advantages in external visibility, early cash flow and market share (Schoonhoven et al., 1990). In addition, fast and simple structures for startup cooperation is important as it might create first-mover advantages. The results in Fig. 6 show that the departments are able to initiate cooperation within 3 months, which may indicate that longer periods should have room for improvement.

Those differences might relate to the perceived importance of lower administrative hurdles in corporations, that can make the startup work very complicated. The lower bureaucratic hurdles may enable corporations to establish clear and fast processes for startup cooperation. Higher startup budget, higher ownership of innovation, lower hierarchies, and lower resistance of the workforce are valued as important for the overall improvement of startup work. Those values are indicating that corporate-startup work has significant room for improvements. Despite the statistics, the majority of surveyed corporate-startup departments assess their startup work as a success. A Boston Consulting Group (BCG) survey investigating 500 companies in Germany, Austria, and Switzerland find that 45% of the corporations and 55% of the startups are either “very dissatisfied” or “somewhat dissatisfied with their corporate-startup cooperation (Brigl et al., 2019).

The study of Capital and Infront (2017) find that no corporate-startup department managed to establish a new significant new business. The study concludes that corporate-startup programs develop ideas but lacking the necessary internal resources. Moreover, corporate leaders perceive corporate-startup programs as potential competitors (Kreimeier, 2017).

## **Chapter 5**

### **5.1 Venture Capital Characteristics**

Several entrepreneurs require financing to start, develop and grow their business (Bellavitis et al., 2017; Gill et al., 2011). Market feasibility and acceptance of new products are unknown and uncertain, which makes the demand, pricing, and product acceptance hard to assess. Uncertainty, and not existing data availability and missing comparability, complicate entrepreneurial financing (Werner et al., 2016). VC investments provide early insights into new technology and markets,



hence business opportunities (Klein, 1987). Historically, main innovation drivers and technologies in business growth areas, are developed by small firms (Sykes, 1990). Drover et al. (2017) describe that high growth startups focus to a great extent on external financing like VC and CVC investments. VC investments in entrepreneurial firms have high risk, but also high potential (Strömsten & Waluszewski, 2012). VC funds are prominently successful in their investment decisions, shown by significant higher success rates of VC backed firms (Dorsey, 1979). VC backed firms experience more revenue growth, but not necessarily higher profitability. Firms with VC backing tend to encounter faster growth and higher chances of 5-year survival. However, the like hood of survival seems to be reversed, after 5-years (Puri & Zarutski, 2012).

The existence and participation of corporations in VC were characterized by fluctuations of the overall economic situation (Chesbrough, 2002). Several corporations were participating in CVC and stopped their involvement in economic recessions. In recent times several corporations start their own CVC vehicles to invest in startups. Corporations engage in CVC to benefit from future market disruptions, in order to gain access to innovation (Fan, 2018) and new resources and market opportunities (Maula et al., 2013). The incentive of classical VC is to maximize return of investments. As a result, VC funds typically focus on a strictly financial view of returns. For CVC, other reasons might be of interest, as strategic value can be added through innovation to the corporations' core business (Yang et al., 2014). The historical development and influence of VC on specific markets and clusters are important to get an idea of how VC is driving innovation and economic growth. The industry specifications and economic situations, in general, are different and have to be regarded separately. The development of the internet, biotechnology, health care, new materials and information technology were developed due to the availability of VC for startups (Nanda & Rhodes-Kropf, 2013).

Firms with a more “innovative strategy” are more likely to obtain VC financing at a younger age. VC has great influence on the design of the strategy of young firms (Galloway et al., 2017). Young firms receiving VC financing often regard funding as a major milestone in their firm’s life cycle. Additionally, such events communicate firm value to the market (Abor, 2017) and among others, might be used for marketing purposes.

VC funds raise money from individuals and institutions to typically invest in early-stage entrepreneurial projects (Matusik & Fitza, 2012). These projects often characterize extreme uncertainty, asymmetric information, but the potential of high rewards (Gompers, 1997). The growth of young firms is often limited, caused by trouble to attract financing (Alperovych et al., 2020). VC funds provide essential funding to firms (Gompers & Lerner, 2001). Samila and Sorenson (2012) state that VC is a central source for financing radical innovations in the US.

VC consists of managed capital that focuses on equity or equity-linked investments in privately held, high growth firms (Gompers & Lerner, 1999). Usually, VC follows a recurring pattern, starting with raising money for the VC fund, proceeding with investing, adding value, and monitoring (Panda, 2018; Gompers & Lerner, 2004). VC funds aim to realize financial returns on their investments and return is achieved by selling shares of firms invested in. The profit earned can be distributed to investors or be invested in new VC funds. (Gompers & Lerner, 2001).

Different economic and market factors influence VC activities. The access to capital influences the volume of money VC funds are able to invest. Moreover, the return on investment, as well as associated risk, are crucial for the frequency and amount streaming into the market. A favorable initial public offering (IPO) market, creates growth in VC investments (Félix et al., 2013). The investment of VC and the realized return depends on the conditions and number of exit deals made. In order to realize financial returns from their investments, VC funds sell their shares. The VC

return results from the investment sum at current valuation and the amount realized at an exit event (Köhn et al., 2018).

In the early years of VC, traditional firms were careful in establishing relationships, collecting and investing corporate money. Classical VC funds aim for significant financial returns and thereby an excellent reputation in the markets. The relationship and amount of invested money in VC is related to the liquidity and capital at disposal in the market. VC funds are getting the opportunity to raise more money, which results in more substantial and more frequent investments (Gompers, 1995).

VC funds have two possibilities to underwrite their sales. On the one hand, VC funds can sell their shares to other investors, where the buyer could conceivably be another private firm or corporation in the market. On the other hand, VC funds sell their shares to the public via an IPO.

The past IPOs showed, at the end of the first trading day, an average value increase of the firm of 18.8% at closing. After three years of the IPO, the average return is 22.6%, which underperforms seasoned companies with similar market capitalization and book-to-market ratio by 5.1% (Ritter & Welch, 2002). The reasons for such developments could be that the underwriter involved in IPOs is found to be more experienced when they are venture-backed. Tutuncu (2020) expresses that valuation of underwriters is associated to the optimistic valuation bias. The underwriter is the financial specialist who determines the price of firms and buys the shares to sell them via his distribution network (Megginson & Weiss, 1991). The reason to have more experienced underwriters involved in VC backed IPOs, is related to the record of accomplishment of VC funds in the market.

As a consequence, VC funds have experience with different underwriters and are able to distinguish them by experience and quality. Moreover, fees of IPOs are lower when the firm is backed by a VC fund, which is attributable to industry, market experience and business relationships of VC funds. Furthermore, VC funds regularly hold their shares for a certain period after IPOs, usually

for a pre-specified period agreed with the investment bank, which lies often around six months (Brav & Gompers, 2000).

Lerner (1994) shows that VC funds take firms public, when valuations are high, to be more precise, at market peaks. In case of weak control rights, VC firms choose IPOs as exit method (Bonaventura et al., 2018). Timing and decisions regarding IPOs are related to reputation, experience, and the need for financing of new rounds of VC funds (Gompers, 1996). Firms backed by younger VC funds tend to be more underpriced. The first-day investors are considerably rewarded by the underpricing and increase the value of the shares during the IPOs. The effects of a growing firm's publicity seem not to be crucial for undertaking IPOs (Ritter & Welch, 2002). Krishnan et al. (2011) state that VC reputation positively impact the portfolio firms long term performance post IPOs. IPOs often exists for VC funds but not necessarily for entrepreneurs (Black & Gilson, 1998). Ritter (2014) reports that 1,000 of 500,000 of founded firms in the US receive VC financing and account for 40% of the US public listed companies over the three last decades. VC backed equity is positively associated with IPO valuations in the UK (Bruton et al., 2010).

The nature and characteristics of newly founded firms are often associated with the lack of records of accomplishment (Festel et al., 2013). New organizations often miss knowledge of markets, the commitment of employees, and business relationships (Stinchcombe, 1965). Additionally, there might be a lack of routines and experiences of production lifecycles or meeting seasonal demand. Dhochak, and Doliya (2020) declare that startup valuation is often a process of negotiation between VC firms and entrepreneurs.

There could be several decisive points of high uncertainty of startups, especially at the early stages of the lifecycle. All characteristics that tend to increase uncertainty, increase difficulties of firm valuation and the assessment of risk, associated with possible failure. Complementary to the

uncertainty of early-stage firms, VC funds often invest in new technologies (Abor, 2017). High and new technologies can have a great impact on markets and overall economy but tend to disappear more often than to generate the desired technological shift (Rosenkopf & Tushman, 1994). Those conditions are predetermined for VC, as uncertainty and returns seem high and require considerable expertise of business environment, technology, and an outstanding network. The entitlement of VC is that mentoring and support of entrepreneurs, is as crucial for the success of firms as the capital infused (Gompers, 1995). The startups, where VC funds are about to invest human and financial capital, are at question, because of decisions made under uncertainty about the organization and its financial survivor (Stuart et al. 1999). Metrick and Yasuda (2010) note that VC success is determined by taking informed bets and effective termination. When uncertainty is high, rounds of financing take place in shorter time intervals ensuring that investments can be liquidated, if no potential of future success is given. Investments are characterized by the risk of adverse selection, which makes investments challenging. Based on the high potential of conflicts due to adverse selection, VC firms use risk mitigation for venture investments (Tian, 2011). Information asymmetries may be significant among investors and management due to adverse selection and the risk of deviation on common agreements and strategic goals.

The relationship between VC and entrepreneur was considered from an agency theory perspective in which the VC acts as principal and the entrepreneur as agent (Bertoni et al., 2013). The agency theory is of great importance, as entrepreneurs might act in their self-interest and even continue projects (Panda, 2018), with negative net present value. Fehr and Schmidt (1999) note that nearly all economic models assume that all people act in their self-interest and do not care about social goals. Several different behavioral theories are influencing the decision of various stakeholders (Kahnemann et al., 1986). Rabin (1993) describes the punishment of free riding, as people want to behave correctly to people who treat them fairly and punish those who do not. In the case of VC,

free riding and no support of the startups invested in, might afflict the point that entrepreneurs do not want certain VC funds as their investors. Entrepreneurs might refuse VC due to excessive interference in company management (Cestone, 2014). Refusing specific VC funds could be due to the lack of professional support and conflicts with possible future VC funds. Therefore, the investment and financing decision of VC funds and startups deals not solely about the amount invested, moreover it includes the idea of joint cooperation or an agreement of partnership. In relation to the urgency of funding, startups tolerance increases to accept investments from less ethical VC (Drover et al., 2014a). The entrepreneurial firm that raises equity can have incentives to engage in wasteful expenditures due to personal benefits for entrepreneurs. Relating to the findings of Grossman and Hart (1986), describing difficulties in writing contracts of governing the financing of firms, since the outcome, ability, and performance of the entrepreneurs are unpredictable. Asymmetric information concerning startups increases the importance of governance and control (Cumming & Johan, 2013). This problem may increase with the intangible assets of firms, as they are challenging to evaluate. The principal-agent conflict can be current, as startups may have different incentives and plans compared to investors. VC funds should ease these conflicts and difficulties of interests, as they have the knowledge and skills to evaluate startups and their employees (Fazekas, 2016). Associated with the thorough analysis and selection of firms, continuous monitoring of invested firms might be necessary. The preparation of VC funds on potential investment targets is essential. At those screening processes, VC funds analyze business plans of startups and design contracts that reduce potential agency costs (Croce et al., 2013). The use of convertible securities, the staging of investments, and the formation of syndicates are often used to monitor and reduce agency costs (Gompers, 1993). Higher contractual arrangements to try to control behavior of portfolio firms are used, when fixed payouts are higher (Bengtsson, 2011).

The staging of investments enables VC funds to request new information and monitor firm performance with the ability to discontinue projects. Multistage investment strategies are used by VC especially in environments of high volatility and asymmetric information (Grenadier & Malenko, 2011). The invested capital can be dispensed by VC funds at discontinuous stages to firms to execute and preserve control (Gompers & Lerner, 2001). This staged capital infusion is an effective control method, as denying further capital to venture partners is signaling bad investment risks to other capital suppliers. Moreover, managers can be disciplined, in cases of dismissal, by the right to repurchase the shares at prices below market value (Sahlman, 1990). Stage investment, as insurance effect, adds significant value (Lukas et al., 2016). As a result, the losses are limited to the amount invested. If firm's experiences negative future returns, the project can be excluded from new financing (Gompers, 1995). The exposure is reduced for development and agency risk, as investment activity can be stopped or renegotiated at different stages (Li & Chi, 2013). VC can engage in post-investment monitoring (Bernstein et al., 2016), which are costly as opportunity costs occur. The analyses, valuations, and reports necessary for successful monitoring are time and cost-intensive for VC funds and startups. VC funds can structure funding in shorter periods and accurately counted staging rounds with an increased effort to gather new information and monitor entrepreneurs more frequent. Van de Vrande and Vanhaverbeke (2013) express that with high uncertainty, firms may profit from small investments, in order to learn about their investment opportunity, to undertake larger investments when uncertainty is decreased. The tradeoff between resource-intensive monitoring through small staging rounds with greater control is associated to considerable effort with higher costs. Interrelated monitoring is negatively allied with expected agency costs (Gompers, 1995). However, close monitoring can have a negative influence on the firm's development, as a conflict of interest, as well as power struggles between founders and investors may occur. Negotiations between VC firms and entrepreneurs can determine the choice

of control structures in start-ups (Wang et al., 2017). As VC funds and entrepreneurs are individuals that face uncertain situations, the right degree of monitoring is very different on a case to case basis. Furthermore, it might depend on personal interests and visions the VC fund and the startup wants to achieve. Burkart et al. (1997) express that too extensive monitoring can damage entrepreneurial activities.

An increase in asset tangibility of firms reduces the monitoring activity, but increases the financing duration (Gompers & Lerner, 2001). VC funds often appear as investment-syndicates, where more VC funds invest simultaneously in one startup (Gu & Lu, 2014; Keil et al., 2010) where one VC usually takes the role as lead investor (Bernstein et al., 2016). Hochberg et al. (2010) express that VC investment decision is influenced by investments of other VC firms. Investment-syndicates should reduce firm specific-risk of false evaluation, which could be associated with valuations of single firms (Manigart et al. 2006). Furthermore, multiple VC funds offer more knowledge and expertise for assessment. Lerner (1994) finds that VC funds investing in early-stage projects want to syndicate with VC funds of similar experience. Therefore, the second opinion of venture colleagues seems to be of great importance, additional to the extra funding. VC funds investing in syndicates have different stakes, which might relate to the degree of interest and the effort of monitoring. Consequently, lead investors commonly play a crucial role in promoting innovation and growth by proactively monitor their portfolio companies (Chemmanur et al., 2011). Legal environments impact syndicate behavior and deal screening (Cumming et al., 2010). More investors and monitoring activities can lead to free-riding of some VC funds in investment syndicates (Nanda & Rhodes-Knopf, 2013). VC funds can invest in startups following an experienced VC fund, leaving large parts of monitoring and the agency conflict to the lead investor.

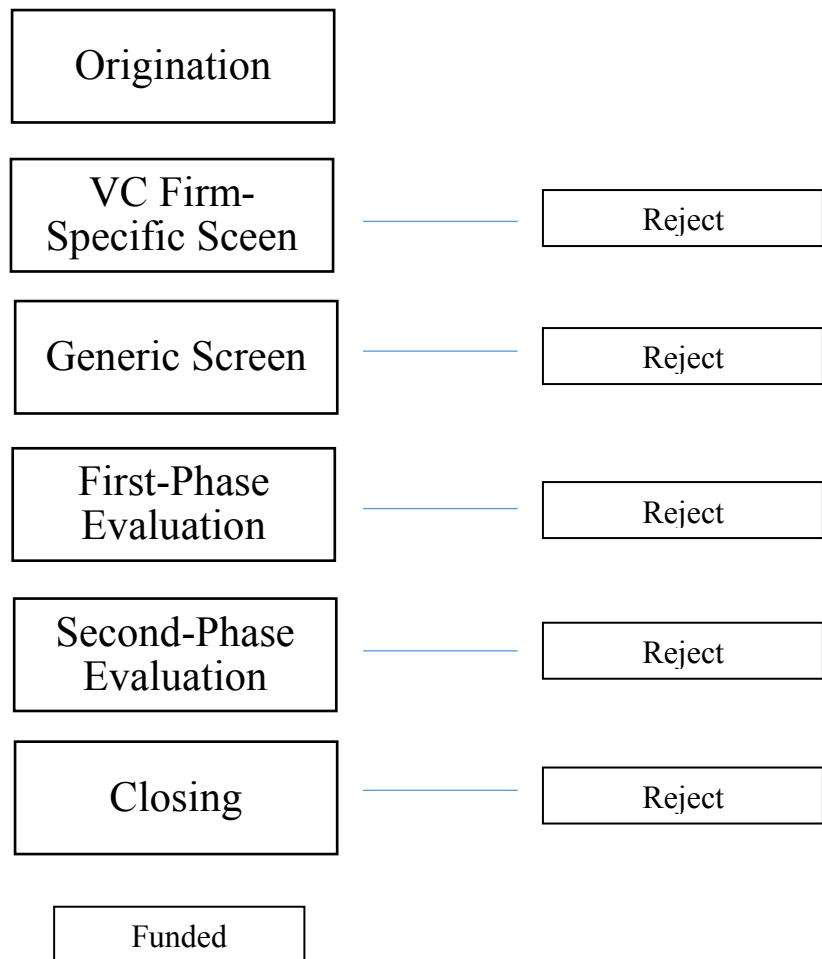


The VC funds and their involvement in startups are indicated by the number of seats taken at the board of directors (Lerner, 1995). The efficient monitoring of ventures might relate to the geographical distance between firms' Head Quarter (HQ) and VC funds. Li et al. (2014) find that cultural and institutional distance is negatively associated to successful VC outcomes. The compensation of startups management can be used to create incentives for entrepreneurs, to act in the interest of VC funds. One option is to tie the entrepreneur's salary on the firm's equity stakes. CEOs of venture-backed firms have more significant equity stakes in their firms to similar counterparts without VC investments. Beyond the amount of equity stake, VC funds can employ control mechanisms about equity holdings. Arcot (2014) indicate that VC firms make use of control mechanisms, as e.g. stock options. In order to be able to realize his company stakes, the entrepreneur has to vest those, over a multiyear period. If the predetermined regulations of vesting are not met, shares can sell at discounts or even turning worthless. Moreover, VC funds can proceed with financing rounds and dilute, thereby the value of shares of the entrepreneur. In general, vesting is often used for startup shares. It predetermines and regulates the future rights of ownership of firms, which can occur when predefined targets are achieved (Anshuman et al., 2012). As it might happen, that different views, opinions, and motivations change the structure and ownership relationships of the firm, vesting should ensure the commitment of entrepreneurs to the underlying firm and its performance. Besides, free-riding and the benefit from the status quo of just being present at the founding period is reduced through vesting.

The investments made are illiquid and the success depends on a usually small group of entrepreneurs (Fried & Hisrich, 1994). The allocation of control rights has proved to be a key factor for start-up governance with the engagement of VC and impacts business success (Wang et al., 2017). The simple financial evaluation of the company's spreadsheets is not possible as many startups show small-sized records of accomplishment. Consequently, investment decisions have to

be made based on additional criteria. Emotional, cognitive, and perceptual processes are necessary to understand human decision making (Fried & Hisrich, 1994). The decision-making process aims to assess the ability and potential of venture business success, financial return and can reduce incentives for adverse selection. The invested effort in the decision-making process of VC funds varies by investment role and size. Logically VC funds will invest more effort in their decision-making process when they are in the lead position and higher investment sums. Petty and Gruber (2011) express that the importance of decision criteria varies across evaluation stages.

Hisrich and Jankowicz (1990) define decision criteria based on the concept of management and return. The concept of potential investments deals with prospective earnings, growth, functioning business idea, competitive advantage or non-competitive industry, and reasonable capital requirements. The management considers characteristics relevant and necessary to be fulfilled by the management team. Personal integrity, working, or founding experiences try to assess managers' skills to handle and detect risk. Additionally, managers need to be flexible, have excellent business understanding, management, and leadership skills.



**Figure 9.** Decision Process of VC funds by Fried and Hisrich (1994)

The VC investment process developed by Fried and Hisrich (1994) is a six-step decision process shown in Fig. 9. In general, accurate decision-making can be time-consuming and is therefore costly for VC funds as it might be labor-intensive. The required time estimated for an investment to pass the six stages decision-making process is 97.1 days on average.

The first step of the decision-making process is “Origination,” which is the way and the circumstances of how a deal was found or initiated. Interestingly, most deals of VC funds are generated and initiated by referrals, from VC firms’ network (Gompers, 2020). The importance of referrals is related to the valuation of their own network, implying that VC funds have confidence in the judgment of their network due to previous experience made and their industry expertise.

Therefore, referrals are often more selective and purposive with an understanding of VC fund requirements and their search fields. This underlines that strong networks are important for VC. Similarities of thinking of entrepreneurs and VC tend to positively affect VC preferences of new investment possibilities (Murnieks et al. 2011).

The second step is the firm-specific screen, as many firms have a special investment focus and requirements related to e.g. firm size, location, stage of financing, founding team. The screening procedure differs for investment focuses based on size, stage, industry and geographic location (Sharma, 2015). The business plan is relevant for most VC funds during the stage of decision-making. Throughout the third step, the generic screening, several proposals that will not fulfill the defined criteria are rejected. The integrity and quality of referred investment opportunities possibly impact those generic screens. The first evaluation phase are conventionally personal meetings of the investment seeking firm and the VC fund. The aim is to get deeper insights and better understanding of their business and industry knowledge as well as professional and personal competences of management. They test possible stress points to identify problems and difficulties of managers and the company. Drover et al. (2014b) state that VC firms are agreeable to accept less control, related to the management team reputation. The different characteristics of management and the business have to be combined and should be analyzed by personal contact and interpersonal challenges, not to mention that the stage of investment is influencing this process of VC funds to a large extent. Gompers (2020) finds that the founding team is the most important factor in the selection process. Later stage investments can focus more on hard facts and accounting analyses. VC funds may use their industry network to discuss products with existing players and potential customers.

The second phase of evaluation deals with the obstacles that might arise for businesses and how to overcome those. After the first evaluation stage, the VC funds are somehow committed to the company, product, management team, and invest time and effort to improve the business plan. After completion of the evaluation process, closing negotiation takes place. The legal documents and terms and conditions are finalized and are negotiated during this stage. Some VC funds argue that even though a large amount of effort of evaluation, 20 percent of VC deals fail.

The model of Wells in (1974) consists of six distinctive decisions levels for the VC decision process. Firstly, the scouting and identifying of investment opportunities, including communicating and contacting with other venture or investment players like banks or additional VC funds. Secondly, the screening of proposals, where standardized questions of potential investment are challenged. Thirdly, the proposal and business deal are evaluated. After evaluation, VC funds make their decision of funding or rejection of investment. Fourthly, if the investment decision is made, VC funds are spending time with firms invested in, taking part in venture board meetings and strategic follow-ups. Fifthly, the VC funds are dealing with venture operations. Sixthly, the exit and monetarization of investment of the venture partner are executed. This concept of the VC firm's decision model by Wells (1974) describes similar to Tyebjee and Bruno (1984) very broad steps of VC firm's evaluation and selection process.

	Wells (1974)	Tyebjee & Bruno (1984)	Silver (1985)	Hall (1989)
1	Search	Deal origination	Search	Generating a deal flow
2	Screening	Screening	Initial screen	Proposal screening
3	X	X	X	Proposal assessment
4	Evaluation	Evaluation	X	Project evaluation
5	X	X	Due diligence	Due diligence
6	X	Deal structuring	Deal structuring	Deal structuring
7	(a) Venture board meet- ings (b) venture operations	Postinvestment activities  X	Monitor progress  X	Venture operations  X
8	Cashing out	X	Cashing out	Cashing out

Lines are used to separate different stages in venture capitalists' venture management process.

**Table 2.** Different VC investment Decisions Models retrieved from Hall and Hofer in (1993)

There are different decision models compared by Hall and Hofer (1993) showing different decision stages, e.g., Silver in (1985) does not include any evaluation stage.

Hall and Hofer (1993) investigate the decision and procedures of different VC funds on various business ideas in different financing stages. One important aspect is that VC funds have set their focus on certain areas (Sharma, 2015), e.g. health care, real estate, food. As a consequence, they tend to reject or do not even consider investments in other fields. Those specializations make VC funds experts in specific industry areas and focalize their investments in industry clusters.

Risk and return of VC funds are commonly assessed and an important indicator of performance. The different models of VC funds' decision-making process show some variations. However, the research distinguishes and divides the decision-processes into a different number of subcategories. The various models deal with the three main steps: originate, evaluate, and deal structuring. Those three steps can be regarded as the essence of the decision-making process of VC. The different

models show that VC funds invest substantial effort in evaluating possible targets using their expertise and network. Moreover, VC is influenced in their decision making by past experience. Biases as risk perception, overconfidence, inconsistency and routine and framing might influence investors decisions (Mitteneess et al., 2012).

Nevertheless, those models do not provide any detailed insights on why VC backed firms outperform the market. One possible explanation is that VC funds are specific industry or business model experts and usually possess an extensive network of additional experts. Those characteristics should increase the probability of a successful venture. According to Sahlman (1990), VC funds contract negotiation is beneficial, as they address moral hazard problems that would typically arise after investments. The VC industry is rather small, leading to a smaller network in the industry, making referrals and trustful relationships more critical. Therefore, references and interconnected responsibility should reduce adverse selection, as they aim to maintain their relationships (Fried & Hisrich, 1994). As previously mentioned, VC funds are using their network, expertise, and evaluate investment targets with substantial effort in evaluation to be able to invest. The VC funds benefit from economies of scale, as the investment and evaluation efforts are made for many investors. Through the established network and referrals of several investments, VC funds can additionally benefit from economies of scope and profit from experience and learning curves, especially of industry-specific knowledge. Williams (2013) describes that VC should follow a clear investment strategy, which enable entrepreneurs to target those.

Barry et al. (1990) and Megginson and Weiss (1991) show that reputation and VC funds post-investments attach value to capital markets, implying that VC funds are better in controlling and guiding new enterprises. The funds should be managed by VC managers with experience, that proved to be successful (Cumming & Dai, 2011).

Contrary to CVC firms, the ownership and shares of VC are distributed to managing partners and limited partners. The limited partners are investors of VC funds and do not take any active role in managing the fund, after the fund is raised. The managing partners, as the name suggests, do actively manage the VC fund. The structure and collaboration of limited partners and managing partners are associated with potential conflicts. The decision-making process of limited partners to invest and sort for VC is based on different principals. As Sahlman (1990) describes, a good VC fund has the intention to create high risk-adjusted returns for their investors. Influence on the choice of VC funds for investors relates to different market conditions, reputation, and industries.

The capital markets for VC and investor decisions are crucial as they determine the cost and return associated with investments. Briefly described, low-interest rates should be conducive for investments in and of VC funds. Access to capital prepossess one of the requirements VC investments. However, the market of VC investments has to offer some potential for successful ventures. The possibility of profitable investments depends amongst other things on the markets and their ability to innovate and bring new products and services successful into the market. Rosenbusch et al. (2013) indicate that positive performance effects depend largely on situation-specific factors such as level of development and industry.

Nevertheless, those conditions are beneficial for VC and should increase the number of VC funds and investment volumes. Developed financial and stock markets are beneficial for VC, as they provide exist opportunities (Lerner & Tåg, 2013). Most investors assess the risk-adjusted returns, field of investment, experience, volume and reputation of VC funds. Reputation is very important for VC funds to collect investments in the future; therefore, good VC funds offer typically finite life spans. This in fact has several reasons as it signals investors that they can punish VC funds by



stopping future investments. If a VC fund engages in opportunistic behavior or undertakes incompetent investments, access to new capital will be probably denied.

## **5.2 Corporate Venture Capital Movement**

The existence and participation of corporations in VC were characterized by fluctuations of the overall economic situation (Chesbrough, 2002). Several corporations were participating in CVC and stopped their involvement in economic recessions. CVC accounted over the years for 7% and increased in 2011 to 15% of the overall VC investment market (Chemmanur et al., 2014). In recent times corporations started their own VC vehicle to invest in startups (Kolte & Zhang, 2020). Corporations increasingly make investments into early stage startups (CB Insights, 2016).

As CVC developed and has grown over the last quarter century (Belderbos et al., 2018), different waves and motivations can be observed. The pattern perceived are increases in investment sums in states of economic well-being. The rise in investment amounts during economic growth can be explained by the availability of resources and optimistic assumptions on the overall economy and innovation. Chesbrough and Tucci (2002) declare that R&D spending rises simultaneously with CVC activity. As the economy constantly evolves, significant changes and impact on businesses of specific industries, tend to occur caused by technological change, new business models, or governmental regulations. CVC activities gained popularity and importance due to great opportunities for continuous innovations and growth (Folta & Miller, 2002; McGrath & Nerkar, 2004). Ma (2020) finds that CVC activity is related to valuable external information and a period of deteriorating business innovation. As a result, corporations create the ambition to find new

products, services, and technologies that may have the potential to substitute current ones and gain insights about new technology and innovation. In essence, the exploration of new or complementary business models and leverage innovation created by others. Moreover, CVC investment activity is related to markets with great product competition (Kim et al., 2016).

Chesbrough (2002) defines CVC as the investment of corporate funds directly in external startups companies, excluding corporate investments in externally managed funds. CVC investments are small equity investments in startups (Gompers & Lerner, 2000). The survival and adaption of existing organizations to changing environments differs, because those changes can diminish some of the organization's existing assets (Levinthal, 1997). Wadhwa et al. (2016) reports that CVC firms see startups as access to new technology and innovation.

The invention and distribution of personal computers related to changes in markets and the economy were accountable for uncertain market situations, which increased CVC activity.

Substantial economic changes led to uncertainty, raising questions for companies, whether existing businesses can and will be successful in the future. The fear of obsolete business models can set off changes in business structure, promote new thinking and innovations. To actively deal with this uncertainty and changing circumstances, established firms need to expand the diversity of their technological knowhow (March, 1991).

The fluctuations of CVC investments indicate dependencies on the overall economy or industry. These peaks and changes can depend on different focus and market conditions. VC investors interpret those CVC waves as a lack of knowledge and ability to successfully invest in high risk and fast-changing environments (Chesbrough, 2002).

The success of classical VC in the United States in the mid-1990 lead to increases in CVC activities and opens the discussion of whether CVC has mirrored VC activity in the past (Gompers & Lerner,

2000). As CVC cycles appear to carry on, focus and strategic orientation seem to differ. CVC capital waves were targeting to promote innovation, strategic investments, and financial return (Chesbrough, 2000).

In 2015 CVC invested \$7.7 billion in 930 rounds (NCVA, 2016). CVC activity increased in the period from 2010 to 2014 from 625 to 1000 firms. (Venture Beat, 2014). In recent times, CVC deals increases from 2017 to 2018 by approximately 47% globally. Furthermore, 264 new CVC firms were investing for the first time in 2018, which is about a 35% increase compared to 2017. On a global scale, CVC participated in deals worth of 52,95 \$ Billion across 2740 deals in 2018 (CB Insights Research, 2018). The historical development shows that CVC can have short durations. The short life cycles might relate to the market situation, where corporations use CVC programs in times of radical technological change. After technological discontinuity, the CVC program might be no longer of relevance. In turn, short life spans can result in operational inefficiencies related to missing autonomy and appropriate resources.

### **5.3 Focus of Corporate Venture Capital**

Ivanov and Xie (2010) differentiate between strategic and financial focused CVC firms. Röhm et al. (2018) state that it is not possible to make such clear distinction of the strategic orientation of CVC. Dushnitsky and Lenox (2006) are not able to clearly assign 116 out of 171 CVC firms as either completely strategic or financially focused.

Investments orientation of CVC and its focus of investments can be strategic, financial, and a combination of both referred hereafter as a combined strategy. Relating to classical VC, financially driven CVC seek and evaluate their investments on return on investments (ROI) (Asel et al.,

2015). During the new economic crisis, CVC did not manage to gather financial gains in the same way as classical VC, added by relevant market risk (Weber, 2005).

Strategic investment focus can have different and various objectives. One aim of CVC can be to screen and monitor technological developments for the parent corporate business and identify market opportunities (Ernst et al., 2005). The R&D departments are not able to actively cultivate and observe technological developments in the market. Investments in startups can provide corporations with a “window on technology” (Röhm et al., 2018), without the need for internal R&D. Additionally, the focus of CVC firms can be the driver of innovation, to create awareness of the need for new ideas and innovation in the organization. New organizational targets might be defined, associated with new products, processes, and business models. Consequently, the driver of innovation should promote overall innovational activity in the organization.

Chesbrough (2002), states investments are defined by CVC objectives and the degree of linkage to the corporation's operation. Hill and Birkinshaw (2014) find that CVC strategic investment focus is characterized by exploration and exploitation of investment strategies. Past research views are that CVC predominantly focus on exploration strategies of CVC (Dushnitsky & Lenox, 2006). As CVC strategies differ, exploitation and exploration can be objectives of CVC firm's investment strategy.

The exploration strategy follows the aim to get access to unfamiliar and novel technologies, which could be characterized by investments in complementary business fields and opportunities. The exploitation strategy is mainly driven to improve efficiency and productivity by extending existing competencies and technologies (Kanbach, 2016). Investments can have a very strong strategic link between corporations' operational strategy and the startup invested in. These investments should enable close relationships with strategic and operational benefits, where CVC firms and the core

business departments usually share information and define the common strategy. Strategic investments should gain access to new technologies, market access, resources and potential acquisition targets (Benson & Ziedonis, 2009). The common strategy may limit investments to the overall corporate strategy. The expectations are to create business opportunities based on organizational resources. The balancing act of exploitative and explorative strategy can be critical. Greater potential of the degree of innovational change and desired outcome are linked to an explorative focus. However, internal and actual results tend to be more visible by exploitative investments, which may be of importance for internal reputation and actual results for the corporations. Davis et al. (2009) state that strong exploitation focus might displace exploration, which may consequence stagnation. Hoang and Rothaermel (2010) express that exploitation and exploration are pre-stages of new products and innovation. Exploration is often assessed to high risk of failure, whereas exploitation to uncertainty, such as governmental approvals, difficult marketing or weak sales (Galloway et al., 2017).

Hill (2014) describes the success rate of CVC as poor, with early closures and not met expectations. The strategic orientation is often regarded as too explorative and not linked closely enough to parent corporate's business. A combined strategy follows a connected strategic and financial investment focus. CVC investments are managed in contrast to VC, by non-financial firms and are often conducted for strategic purposes, by acquiring valuable knowledge from the targeted company.

The investments of strategic and combined focus can enable corporations to get access to new technologies and products. Moreover, investments in startups may signal innovative action and attract media attention, resulting in positive press releases. In relation, firms show that their media reputation positively impacts the preserved amount of VC financing (Petkova, 2014).

The promotion of, e.g., sustainable entrepreneurship or new economic friendly technology, might improve the reputation of corporations and attract new talent. Strategic management needs to evolve further to accommodate a broader, systemic, and global focus that will yield authenticity in business sustainability. Mutual benefit for all stakeholders, necessitates a paradigm shift in thinking from competition to collaboration and creation (Mahsud et al., 2018).

## **5.4 Corporate Venture Capital Capabilities**

The ownership structure, compared to classical VC, can lead to differences in investment strategies and focus. CVC firms have to report and justify their performance only to one single investor who provides funding and resources. The ownership structure could enable CVC firms to be more patient holding investments and realizing returns. Lauterbach et al. (2014) state that VC funds have an inducement to allocate capital promptly to be able to undertake the next round of fundraising. However, single ownership increases dependency, where corporations can decrease the investment budget and stop CVC activity on short notice. Dependency on a single investor might become a liability, when corporations are not able to cooperate successfully with ventures. The corporations' internal structure can be very complicated, including different stakeholders' interests, which can make efficient structures for CVC very hard to assess (Lerner, 2013).

External investments change ownership structure, governance and possibly the firm-level strategy (Wu 2012; Jiménez-Jiménez & Sanz-Valle, 2011). Bernstein (2015) reports possible negative impact, on innovation strategy, through the process of equity exchange. Conflict of interest might arise between CVC and startups, as CVC strictly follow strategic agendas that are beneficial to their parent companies, but not necessarily to the start-ups (Kim & Park, 2017). Park and Steensma

(2012) reports that CVC firms might influence the selection of strategic partners of portfolio firms, especially when the strategic alliance is within the competition of the CVC parent firm.

CVC firms vary according to the structure and the personnel they employ (Souitaris et al., 2012).

Corporations have specific regulations and codes of conduct, which need to be considered.

The organizational structure differs among CVC, where they can operate as separate legal entity off-balance sheet or integrated under the organizational structure, as internal department. CVC firms operating as separate legal entities are mostly following an VC approach with a separate pool of funds (Drover et al., 2017), to react and manage investments with minimal corporate interference. Structural autonomy should empower independent investments without strategic attention of the corporation (Yang et al., 2016). The independence of CVC firms permits more diversified portfolios and risk-taking investments in unfamiliar technological fields (Siegel et al., 1988).

CVC can also be structured as internal VC arm under organizational structure. Dokko and Gaba (2012) state that the portfolio companies are more frequently acquired by the parent companies of internal structured CVC. Internal CVC can have setback regarding greater uncertainty related to changing business cycles and corporations operating budget as the investment are usually based on discretionary resources (Asel et al., 2015). The experience and mistakes made by previous investments may have positive effects on CVC performance. Dushnitsky (2011) states that average CVC lifespans from 2000-2009 were around four years in comparison to the previous average lifetimes of 2,5 years. The increase in the average life cycles of CVC shows an increase in the endurance of CVC, which may result in a corporate's strategy to focus more on external innovation. The costs associated with CVC are substantial, as there is a considerable effort of investing and monitoring startups. Therefore, the purpose and ownership of control are crucial. Higher ownership can legitimate CVC activity inside corporates organization. By leveraging their industry expertise

and organizational resources, corporations can gain direct financial benefits through superior selection and enhancement of their portfolio companies. CVC might add value utilizing screening and evaluation of possible opportunities, technologies, threats, or complementary businesses (Dushnitsky & Lenox, 2006). Operational resources and capabilities are consisting of industry know-how, technological experts, facilities, products, or services to test and evolve venture products.

Moreover, the venture firm might gain access to the corporate distribution network and make use of their bargaining power (Tecce, 1986). The resources of economies of scale and scope may add value to operations and increase the market valuation of startups. In return, corporations may be able to create value through synergies and learn from direct work relationships. There is evidence found that CVC investors can add complementary not-pecuniary resources to their venture investments (Chesbrough, 2000).

Research reports implementation challenges, inexperienced managers, time constraints to evaluate business opportunities, missed relationship building to external VC firms and instable environments (Meyer et al., 2005). Hiring employees with VC experience, tend to make firms less likely to abandon CVC practices, while internal hires make abandonment more likely. Moreover, staffing influence firms learning behavior. CVC managers tend to learn and focus on firms that match their work backgrounds, as former VC managers focus on exit decisions (Gabba & Dokko, 2016). Fang et al. (2014) note that decisions of managers do not depend only on past performance, furthermore on past experience and performance attributes. Experience is a fundamental source of learning (Argote & Miron-Spektor, 2011). As a consequence, the hiring structure can affect expertise available and used in CVC.

The resistance of middle management and their fear of new technologies and new business models could impede CVC activity. Lack of corporate commitment caused CVC failure (Sykes, 1990).



Additionally, CVC firms might constantly fight for their resources, as internal politics can hamper CVC processes and activities (Skyes, 1986). Some CVC firms use internal long-term employees as source of CVC staffing (Souitaris & Zerbinati, 2014). Kleinbaum (2012) reports that individuals maintain their existing contacts, when changing jobs. Internal hires can use their established relations to stay linked with strategic issues, which might influence the business practice. The lack of high and comparable open market compensation may lead key personal to leave CVC firms, after gaining track record and experience of investing. Moreover, the action of successful risk-taking of employees was not appropriately compensated, and in return, failure was hardly punished. CVC managers usually are not as highly compensated compared to independent VC managers. The different compensations happen due to organizational pay uniformity (Dushnitsky & Shapira, 2010) and inter-departmental jealousy. Therefore, CVC firms often failed to attract highly skilled and experienced employees. Fang et al. (2014) state that internal hires might positively position outcomes to top management, despite they are negative

Financial return can be assessed by investors through exits, in contrast strategic returns are less explicit to identify, risky and long term focused (Gaba & Bhattacharya, 2012). Abandonment of investments is a decision based on the expected future performance. VC is uncertain with varying outcomes for long periods of time (Gaba & Terlaak, 2013). Kerr et al. (2014a) state that top performing VC firms have the highest proportion of abandoning projects. Their skill is to design experiments and act upon the results, enable them to enter uncertain business fields. CVC add uncertainty through investments in need of future strategic value (Gaba & Bhattacharya, 2012). The resulting investment strategy is thus usually very conservative and weaken CVC performance (Benson & Ziedonis, 2010).

Lastly, CVC firms often fail to knock-off unsuccessful ventures, as reputation for CVC would decrease inside the corporation. In contrast, VC funds directly write off unsuccessful ventures to

bundle their resources to firms with the greatest potential (Gompers and Lerner, 2000). As an investment of a corporation might signal quality of the startup to the market, it can also impede startups' access to corporations' competition or other VC investments. Therefore, accepting CVC investments can put startups into dependency. CVC engagement can influence the acquisition activity of corporations, as Benson and Ziedonis (2009) find that acquirers might be worse off on previously founded firms, through acquisition premia.

Investors cannot directly observe privately held information of startups. In the case of CVC, startups may not be willing to share critical technologies or assets as they fear the dispossession of their innovation (Dushnitzky, 2004). Ivanov and Xie (2010) specify that CVC firms thereby gain access to business strategies, trade secrets and proprietary knowledge of the entrepreneurial firm. In times of financial difficulties, corporations tend to terminate projects with negative profits. Gompers (1998), found that investments of CVC are more volatile than investments of VC.

## **5.5 Corporate Venture Capital in relation to Corporate R&D**

Corporate R&D can be frequently focused on short-term wins, as VC tends to follow the latest hot topic (Lerner, 2013). Babina and Howell (2018) find that high R&D investments in organizations is related to higher investments in startups founded by employees. The corporate R&D focuses and often tries to improve existing technologies and products. The prominent examples of Kodak, Nokia, and Xerox show only small product improvements based on their corporate R&D. Kodak's R&D department developed the first digital camera but did not proceed to market-readiness as Kodak focused on the development of their successful core business, the camera film, and had to file for bankruptcy. Nokia and Xerox are similar examples of not recognizing their great ideas. As Xerox developed the first personal computer but did not invest enough in their new technology,

Nokia was acquired by Microsoft after they missed the smartphone wave, focusing on their strong position in low-end phones (Burkus, 2013).

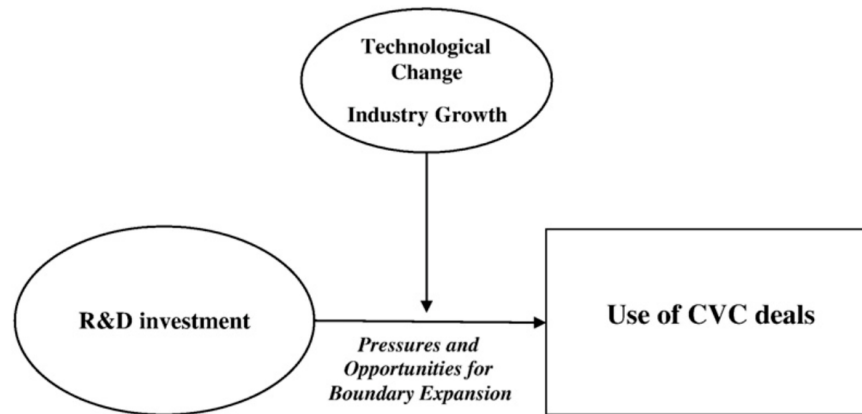
VC is of great importance for startups; however, they appear to have particular specializations on technologies, industries, or geographies. In relation to the findings of Kaplan and Lerner (2000), VC is more powerful than corporate R&D. As VC funding has increased in recent years, central R&D facilities of large corporations redirected towards more applied problems. CVC and corporate R&D are different ways and strategies to develop new products, processes, and businesses for corporations. Access to new technologies can be gained through both CVC and R&D activities. Literature prevails a consensus of internal R&D supporting the use of CVC (Cassiman & Veuglers, 2002; Dushnitsky & Lenox, 2002). The R&D departments could build the foundation and awareness to filter, identify, and exploit CVC targets. Firms with higher levels of R&D investments stimulate CVC deals with stronger relationships in technology-intensive industries (Sahaym et al., 2010). Investing in external startups is of diverse importance for corporations as different strategic orientations, and business environments might influence their involvement. innovations and growth (Folta & Miller, 2002).

Gompers and Lerner (2001) state that it is challenging to build a satisfactory portfolio of new technologies and innovations only by internal R&D activity, as the process is often inflexible and relatively slow. External innovations can be more advanced and be accessed through CVC investments and be able to improve their capabilities to attain a competitive advantage. CVC investments positively impact the company's innovation, both in terms of patents and other industry-specific innovation measures (Paik & Woo, 2017). Also, corporate R&D activities and discoveries are often relevant and contribute to the knowledge pool and advancement of the whole industry (Cockburn & Henderson, 1996). Vanhaverbeke and Roijakkers (2013) express that

internal cooperation along the value chain not only lead to competitive options, it further defines firm's know-how in need from external partners. Napp and Minshall (2011) state that CVC programs contribute to the creation and dissemination of knowledge. Consequently, collaboration with partners along the value chain does not only offer new competitive options, it also forces a firm to define what type of knowledge it needs to source from external partners and what internal knowledge might be licensed out or sold (Vanhaverbeke & Roijakkers, 2013).

Investments in corporate R&D should develop or improve products, that should be offered to the market. Here knowledge and product specifications are free to access for competition, resulting in requisition of the profit invested in. The overall concept leads to a reluctant willingness to invest in R&D in the economy (Arrow, 1962). However, imitation of innovation is not costless. Levin et al. (1987) discover that imitation costs could rise to 50-75% of the costs of the invention. To encourage innovations, governments support R&D with tax incentives, intellectual property systems, and research partnerships (Hall, 2002).

A characteristic of R&D in an investment context is that around 50% percent of the costs associated with R&D accounts for the wages of employees. Those resources and outcomes produced are human capital, with lots of knowledge losses in cases of terminations of work contracts.



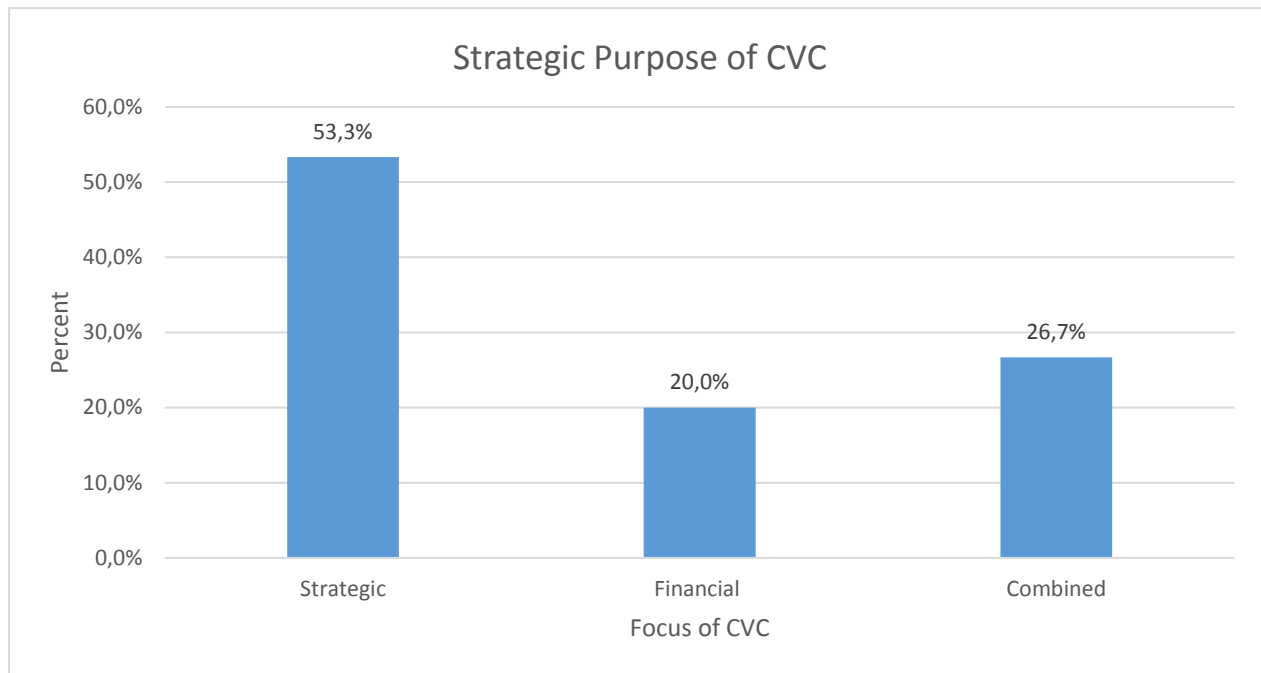
**Figure 10.** Forces driving the use of CVC by Sahaym et al. (2010)

Fig. 10 shows that R&D and the technological change impact the use of CVC deals and influence each other. Therefore, firms must evaluate their options. In real options theory, firms have choices regarding their investment possibilities. It is a financial theory to assess contracts of financial options (Black & Scholes, 1973). The argument is to transfer sophisticated option pricing models to the valuation of firms R&D projects (Roll, 1994). The cost of different options gives managers the flexibility and the opportunity to act quickly in fast-changing technological environments. As a result, they can track and can improve their commitment to resources under a high level of uncertainty (Tong and Reuer, 2007). Lerner (2012) suggests a "hybrid" model, of a CVC program that combines features of corporate research labs and VC backed start-ups to strive innovation.

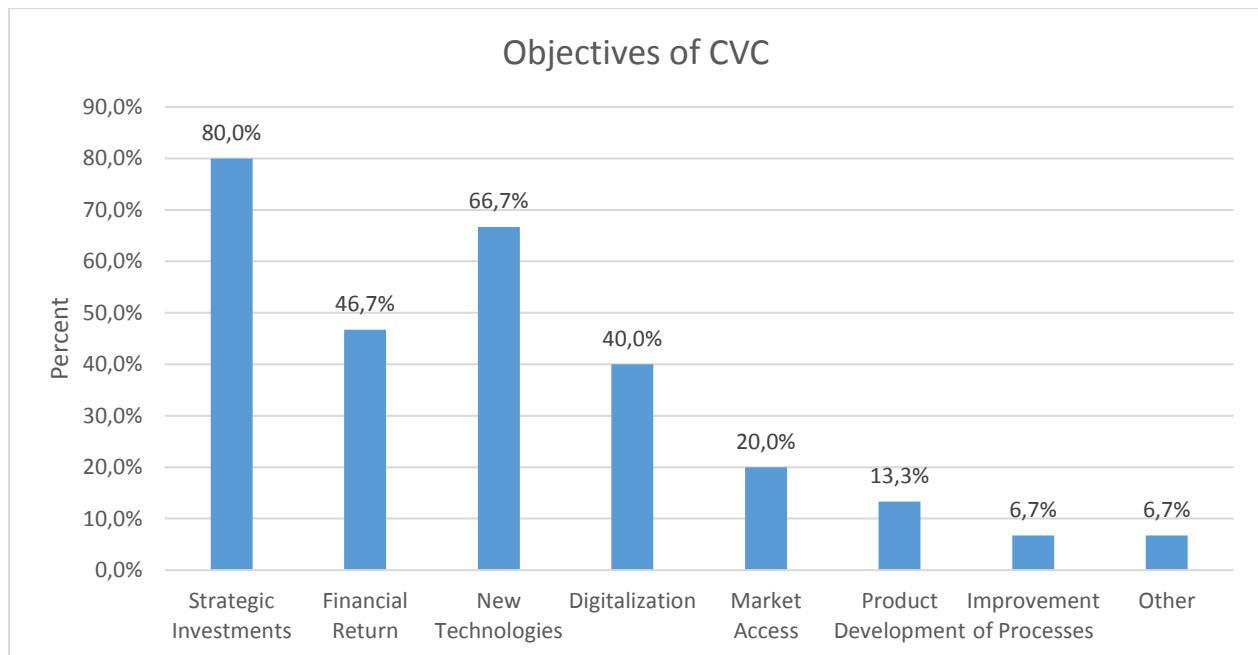
## Chapter 6

### 6.1 Analysis of the German Corporate Venture Capital Structure

Out of the 15 CVC firms investigated, 26.7% seem to follow a combined strategy of financial return and strategic investments. Resulting in 53.3% solely strategic oriented CVC firms and 20% financial oriented CVC firms.

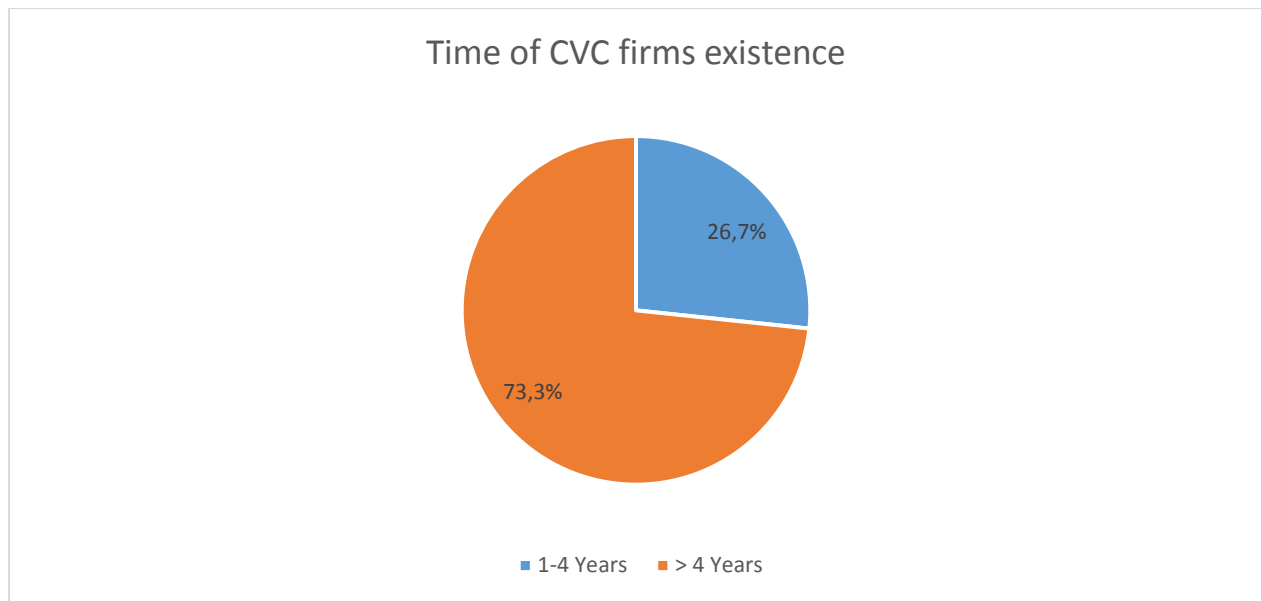


**Figure 11.** Strategic Orientation of CVC



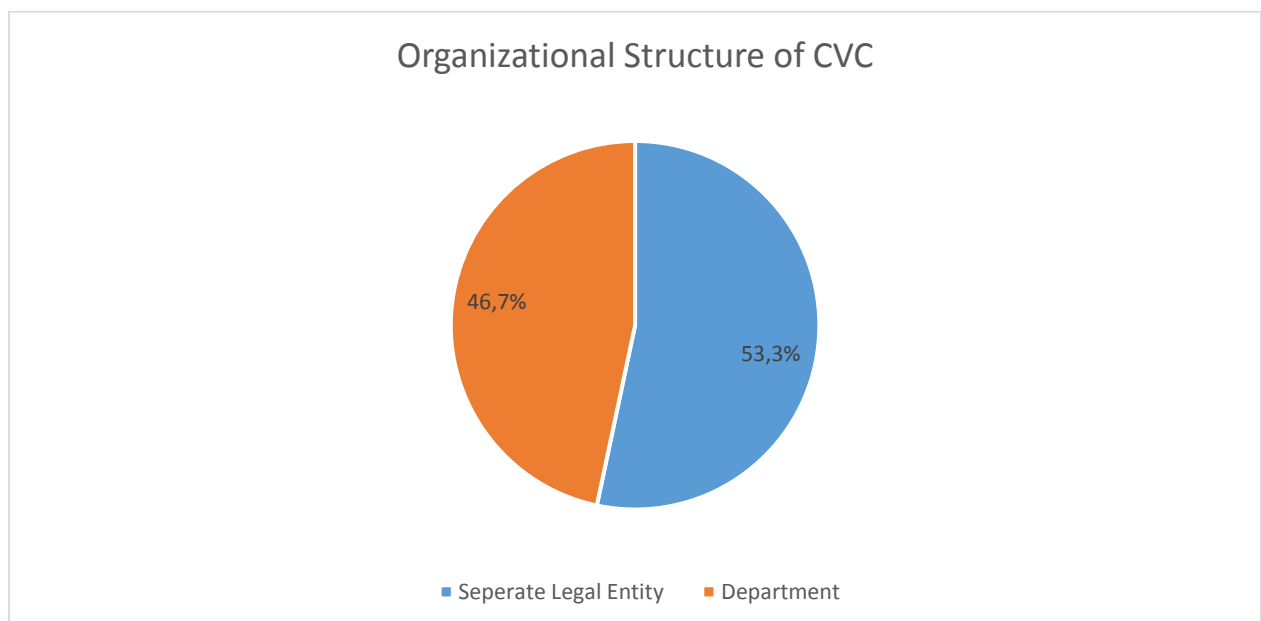
**Figure 12.** Objectives of CVC

In Fig. 12 different objectives of CVC capital are reported. It's a multiple response question, so the case percentages are given. From all respondents, 80% of CVC firms have strategic objectives, and 46.7% have financial return as objectives. Interestingly for strategic purpose, CVC firms are mainly aiming for new technologies 66.7%, digitalization 40%.



**Figure 13.** Time of CVC Existence

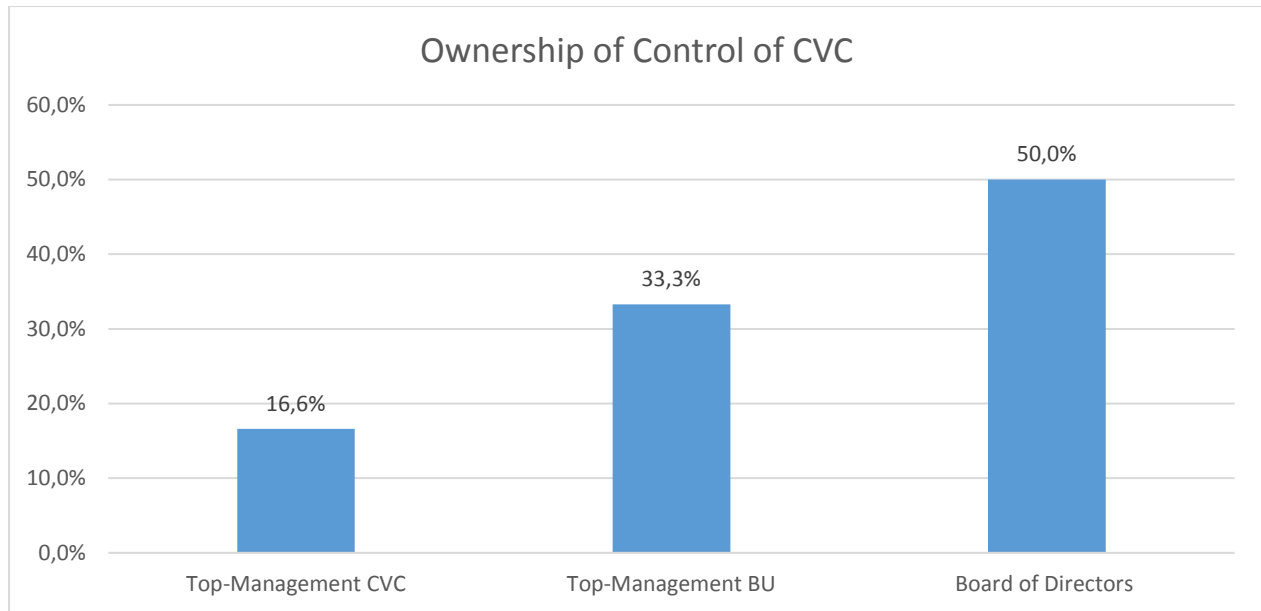
In Fig. 13 the existence of CVC firms shows that the majority of 73.3% exists longer than 4 years, and 26.6% between 1-4 years.



**Figure 14.** Organizational Structure of CVC

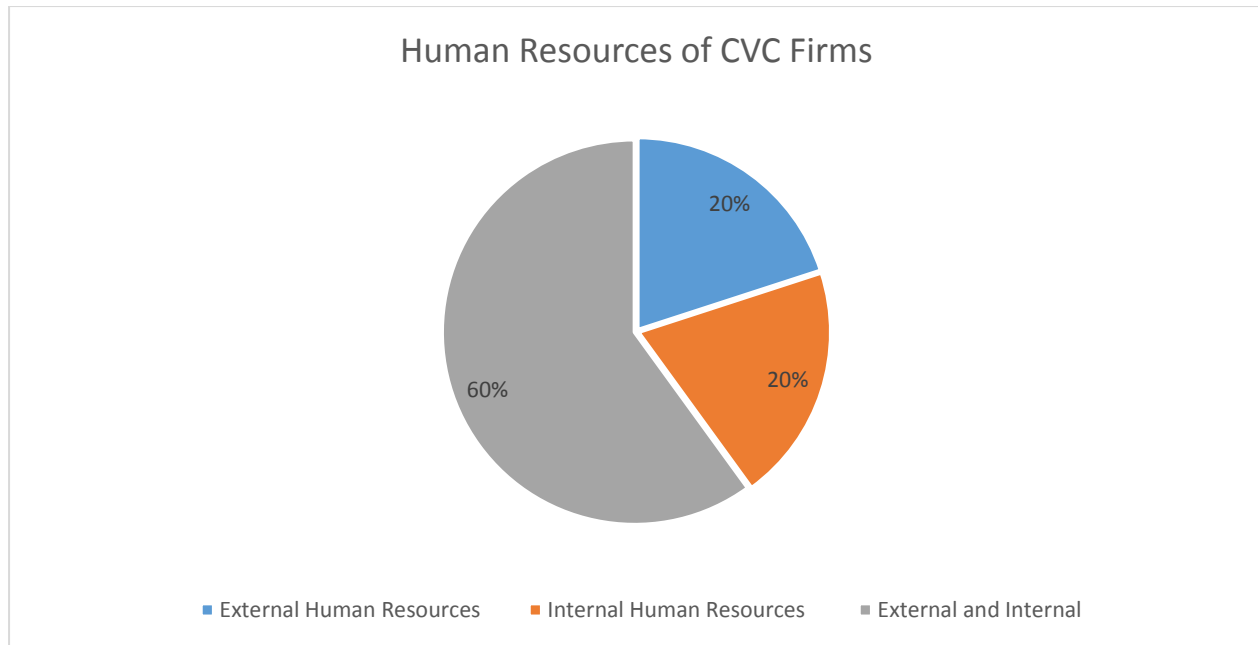


The organizational structure is differentiated by CVC firms operating as separate legal entities, 53.3% and departments under organizational structure 46.6%. All separate legal entities in this study report to corporation's board of directors. The autonomy and level of ownership are essential for CVC operating as departments under organizational structure.



**Figure 15.** Ownership Structure of CVC Firms

Fig 15 shows the ownership structure of CVC departments. The results show that the board of directors guarantees high ownership of control in 50% of the cases. The 33.3% relates to the top management of the business unit, where the CVC department is located in. The top management of CVC has in 16.6% the ownership of control.



**Figure 16.** Human Resources of CVC Firms

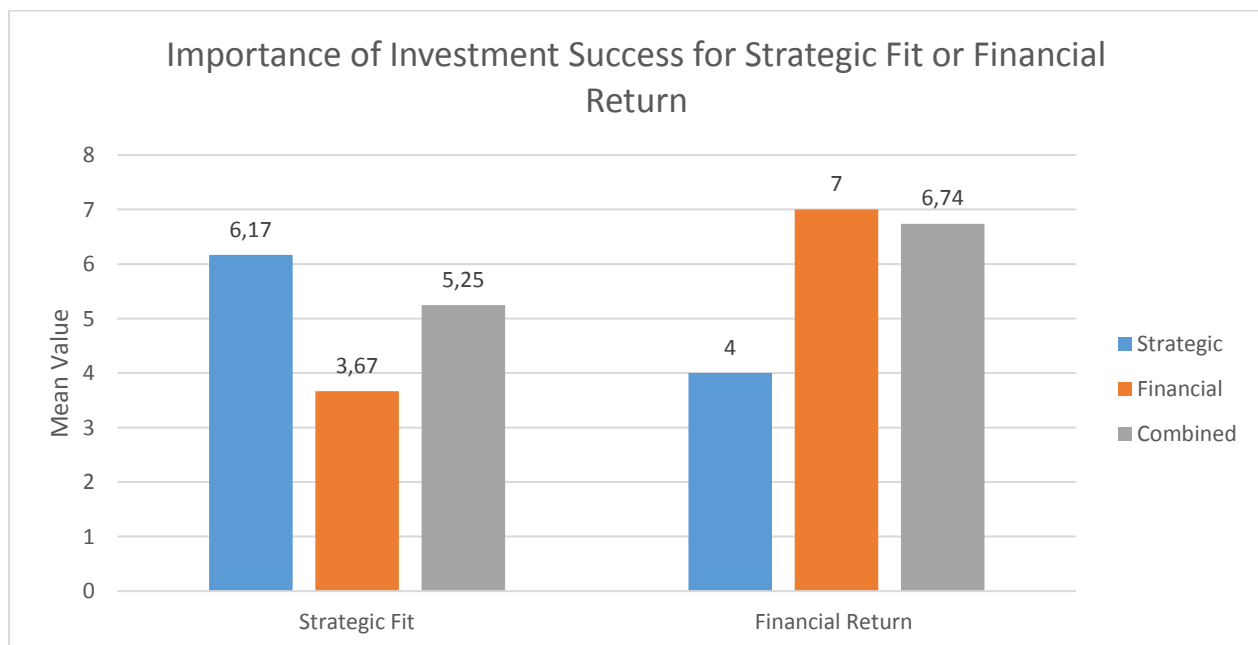
The different origins of human resources are shown in Fig. 16. As the previous experience of investing in VC and CVC should enhance CVC performance for strategic benefits, external and internal human resources are distinguished. The different team compositions are divided by the focus of CVC units. Five of the strategic, focused CVC firms hired their team based on external and internal resources and only three based on internal resources. The financial focused CVC firms hired their teams by one external and two external and internal teams. The CVC firms that follow a combined focus equally hired their teams based on external resources.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
[Financial Return]	13	2	7	5,54	1,664
[Media Attention]	13	1	4	2,77	1,235
[Market Access]	13	2	6	4,54	1,391

[New Technology]	13	2	7	5,15	1,463
[Talent Attraction]	13	2	6	4,00	1,414
[New Products]	13	2	7	5,46	1,450
[Strategic Fit]	13	2	7	5,31	1,653
Valid N (listwise)	13				

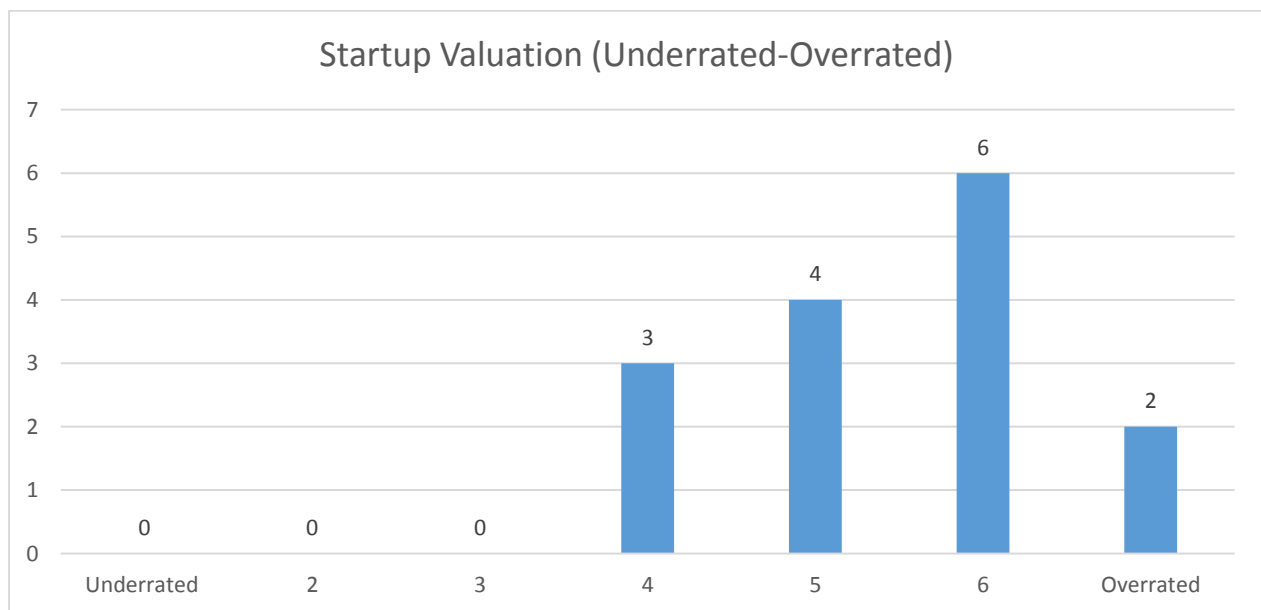
**Table 3.** Criteria to perceive Investment as Success

The criteria of investment success are based on a Likert-Scale from 1 (not important at all) to 7 (very important). The mean value expresses the relative importance of investment outcomes for CVC firms. The financial return has the highest perceived mean value of 5.54 and is regarded as most important to consider investments as a success. New products 5.46, strategic fit 5.31, and new technology 5.15 are perceived as important factors for investments. Market access 4.54 and talent attraction 4.00 show importance for CVC firms. The only criteria which is below the mean value of 3.5 of the Likert-Scale is media attention with a value of 2.77. Therefore, media attention is not valued as important success criteria of CVC investment.

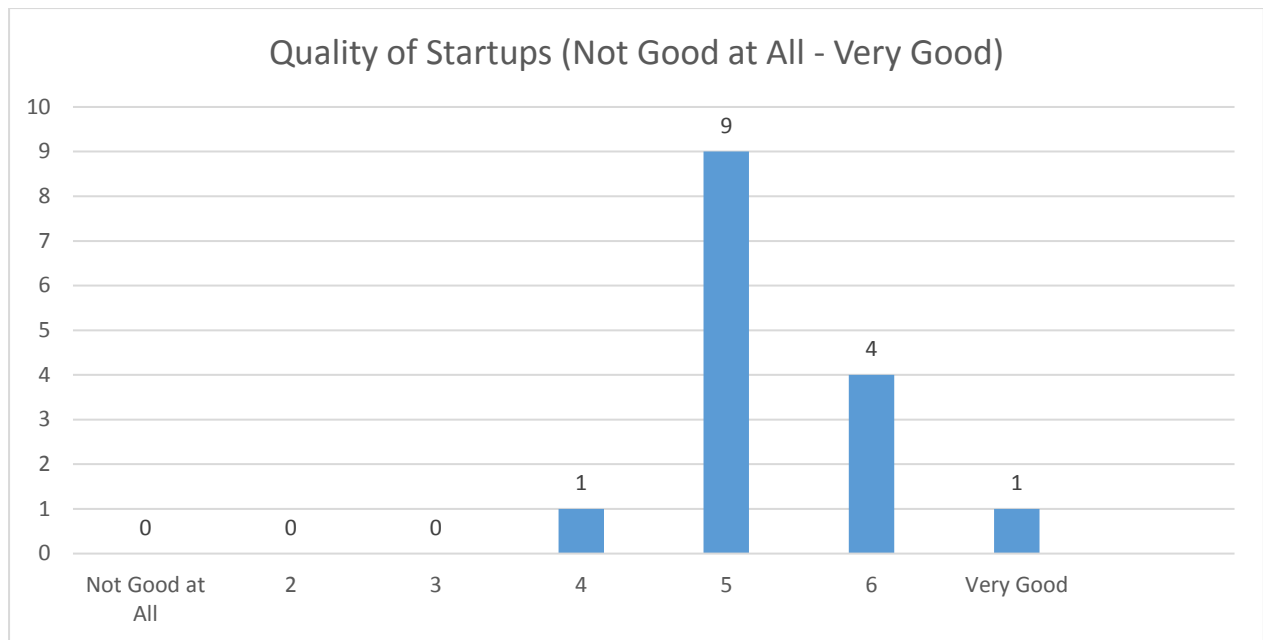


**Figure 17.** Importance of Investment Success for Strategic Fit or Financial Return

The mean values in Fig. 17 of strategic fit and financial return of investments show a clear difference of valuation in importance. The different importance of individual CVC focus are considered separately. The strategic fit has a mean importance of 6.17 for CVC firms with strategic focus, 3.67 for financially focus and 5.25 for combined focus. The mean importance for financial return investment is 4 for strategic, 7 for financial, and 6.74 for combined focus.

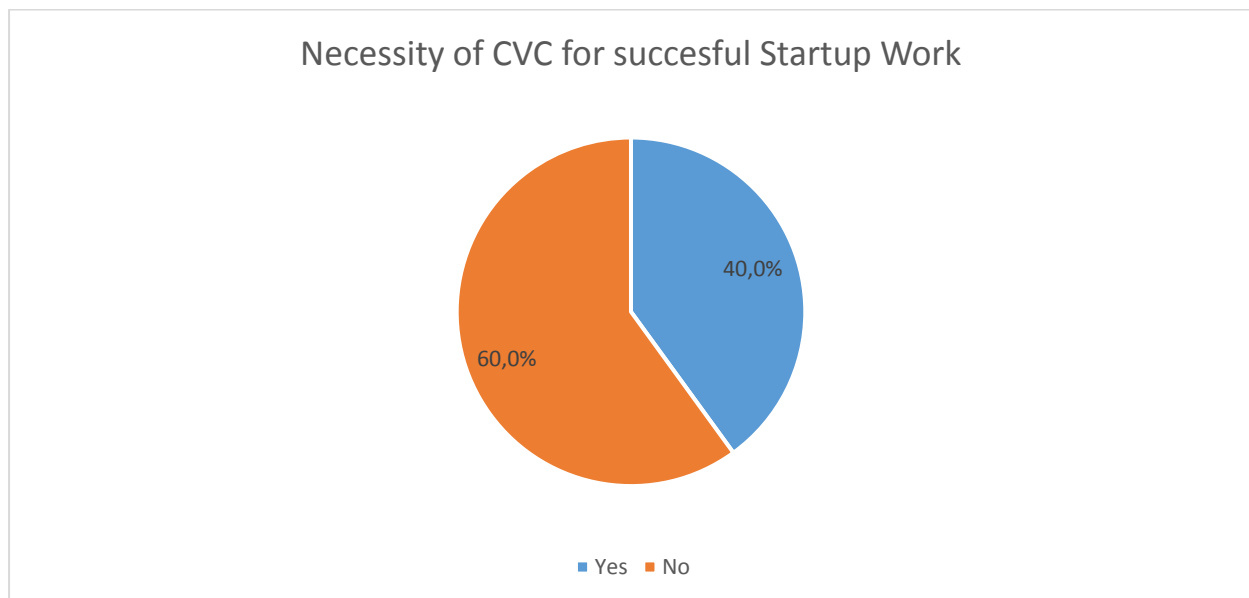


**Figure 18.** Startup valuation (underrated-overrated)



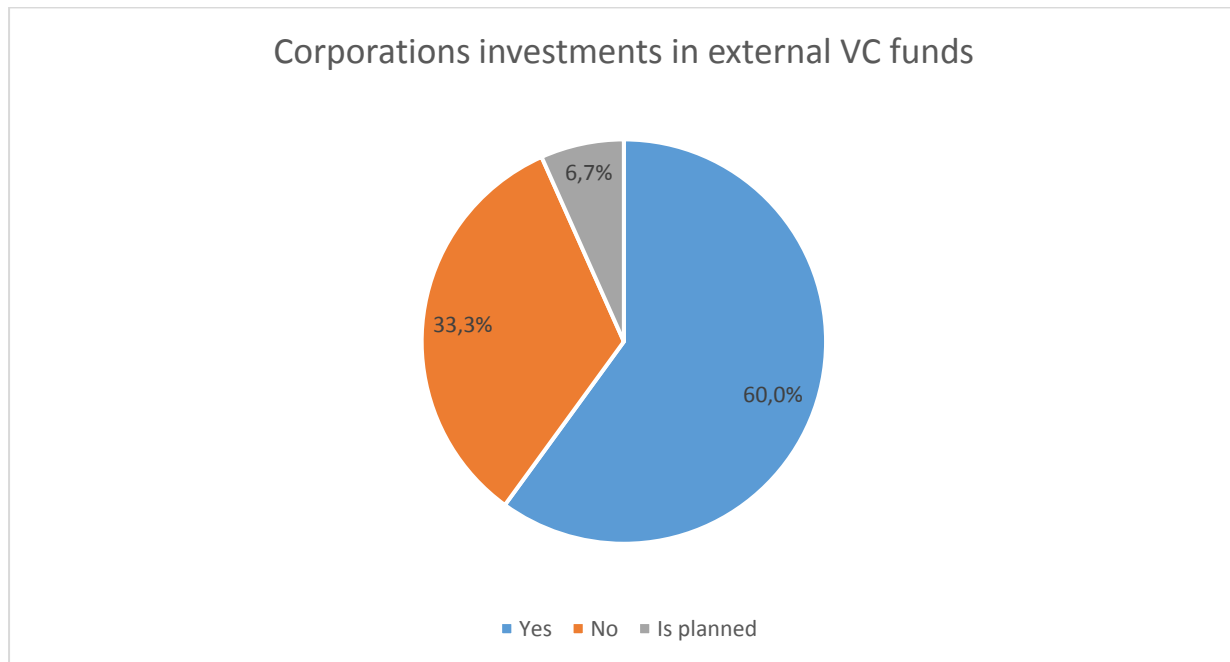
**Figure 19.** Quality of Startups (not good at all-very good)

The perceived startup valuation in Fig. 18 shows a mean value of 5.47, indicating that CVC firms recognize the valuation of startups as overrated. The quality of startups is perceived positively with a mean value of 5.33.



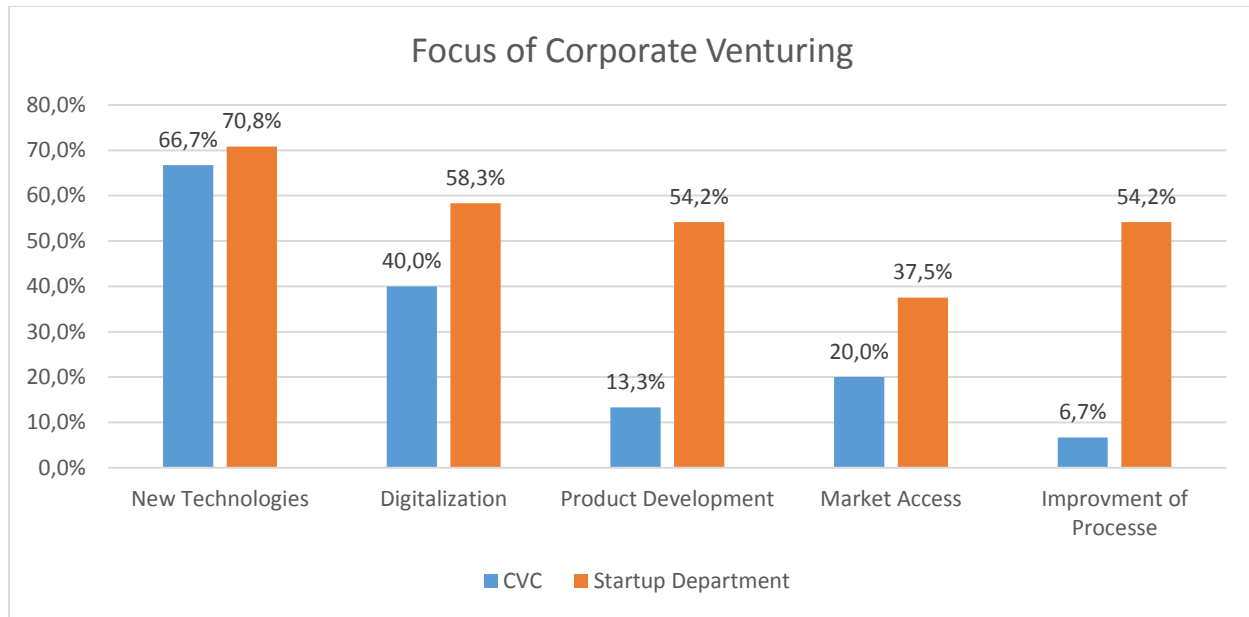
**Figure 20.** Necessity of CVC for successful Startup Work

The CVC firms in the study were investigated whether they perceive CVC necessary for successful startup cooperation, resulting in 40% regarding CVC as essential for successful startup work. In contrast, the majority of 60% do not.



**Figure 21.** Corporations investments in external VC funds

The majority of 60% of corporations invest in external VC funds in addition to CVC. From the three financial focused CVC firms, one additionally invests in external VC funds. From the strategic oriented CVC firms, 50% invest in external VC funds, and 100% of the firms following a combined strategy.



**Figure 22.** Focus of Corporate Venturing

Fig. 22 shows the focus in percent of cases of corporate-startup departments and CVC in relation to new technologies, digitalization, product development, market access, and improvement of processes. CVC focuses more on new technologies and digitalization products than on product development, market access, and improvement of processes. In addition to a strong focus on new technologies and digitalization, corporate-startup departments are searching more for advancements through startup cooperation through product development and improvement of processes.

## 6.2 Discussion

The results shown describe the strategic focus, organizational characteristics, and investment evaluation criteria of CVC firms in Germany. The assessment of post-investment valuation and the perceived quality of startups and their valuation criteria is provided. The German CVC firms are

mainly strategically oriented, 53.3% followed by a combined focus of 26.6% and 20% financial return focus. In relation to previous studies, the results of a study of Ernst and Young (2002) finds that globally, 67% of CVC firms invest in new ventures for strategic reasons. The survey results of Siegel et al. (1988) confirm that the majority of CVC in the United States (U.S.) aims for indirect strategic benefit rather than direct financial return. A BCG study (2016) finds that 24% CVC firms are more financial return focused, whereas 66% focus on strategic benefits (Brigl et al. 2016). Weber and Weber (2005) find that a balanced combination of strategic and financial focus in the German CVC market is associated with comparatively less success. CVC might primarily focus on financial objectives as strategic benefits can interfere with sound financial decision making, leading to a less effective VC process (Siegel et al., 1988). These findings are contradicted by more recent studies of Chesbrough (2002), Dushnitsky and Lenox (2006) and Covin and Miles (2007), advising a rather strategic focus. Fast (1978) and Siegel and MacMillan (1988) find that difficulties of earlier CVC capital programs were related to not well-defined strategies. Not clearly defined strategies of financial and strategic goals led to not desirable outcomes.

Gompers and Lerner (2000) investigate the U.S. market analyzing over 30.000 transactions, finding that CVC appear as successful as VC backed organizations, stating CVC programs should follow a clear strategic orientation, as the lack of focus tends to stop CVC activities after few investments. The different results and conclusions of previous literature show that there are different outcomes and strategies of success or failure of CVC. The dynamic economic situation might influence the focus and performance of CVC. Asel et al. (2015) state that different objectives influence the role of corporate investors, leading to different organizational structures, investments strategy and employee incentives. Besides, different aims and resources of corporations may define, whether CVC is the right medium and adequate strategy for their purposes to justify investments in startups or solely consider non-investment startup cooperation.



The classical VC is a major source of financing radical innovation (Kortum & Lerner, 2001). Corporations want to be part of and profit from radical innovation and new business opportunities. The different strategic aims of corporations have to be considered, and results show that 60% of CVC does not see the necessity of CVC for successful startup work. The results may indicate that CVC is questionable concerning startup cooperation, especially for exploitation strategic focus. The benefits of investing in startup cooperation for exploitation strategy without financial focus are scarce, as startups of quality might have access to VC financing. Adventitiously corporations may be able to offer project-based funding for their startup projects. The objectives of German CVC show that orientations are mainly aiming for new technologies and digitalization and focus less on product development and improvement of processes. The actual access and strategic benefit of investments need to be explored and set in relation to the costs associated with it.

Nevertheless, if decisions in favor of CVC activities are made, the adequate organizational structure, resources, and operational freedom might grant and ensure successful investments. The study of Siegel et al. (1988), based on the independence of structure and performance of CVC, claimed that strong focus and persistence of the strategic fit of corporations could lead to difficulties of CVC operation. The corporation may consider accepting a limited role and commit sufficient resources to grant CVC the necessary freedom of action. If corporations are not willing to accept a limited role, the alternative might be to consider an investment into a classical VC fund. The ownership structure of German CVC shows that nearly 50% are operating as departments under the organizational structure. If the CVC is under the organizational structure of the parent corporation, it may be of great importance that the ownership of control is high. High ownership of control might lead to more trust and decision autonomy in the organization. The degree of organizational trust and operational freedom may enable CVC to successfully concentrate on their tasks and align their investments to their predefined strategy. The investment success factors show

that financial return is an important factor for all strategic orientations of CVC. Strategic fit is hard to measure (Asel et al., 2015) as a consequence strategic oriented CVC may need to consider financial return to justify their investments made. Especially when success and results of strategic investments cannot be clearly proven, as Sahlman (2010) finds that 85% of returns for VC firms are achieved from 10% of investments. The attraction to talent seems to be at least an important factor for some CVC firms. The startup valuations in the current market are regarded as overrated by a perceived good overall quality of startups. That may indicate that too much capital is in the markets for funding and raises the question of whether CVC is a suitable tool for startup cooperation.

## **Chapter 7**

### **Importance of Cooperation for Startups**

Corporations and startups have different structures, resources, routines and scale to run their business (Weiblen & Chesbrough, 2015). A cooperation involves startups and corporations and should in the best cases combine their interest. The alignment of interest and needs are crucial and of great importance for every corporate-startup cooperation. The different startup characteristics can shape the cooperation endeavor. The previous sections analyzed corporate-startup departments and CVC units and in order to provide a comprehensive understanding of cooperation's characteristics concerning startup cooperation. This section deals with the characteristics of startups and their interest and obstacles of cooperation with corporations.

Startups tend to be small and flexible; as a consequence, they can react on market changes, trends, and innovation more easily. However, necessary resources as capital, production facilities, and

human resources are often missing. They have the ability to generate valuable innovation but need the necessary resources for their development and market entry (Neyens et al., 2010). Especially, startups in high technological areas are typically in need of extensive resources for R&D, the market entry and technological legitimation. The capabilities of startups in comparison to established firms are that they face fewer regulations and more freedom of decisions. As a consequence, startups have more innovative capabilities, facing the challenge of implementing or bring innovation to the market (Khilji et al., 2006). Usman and Vanhaverbeke (2017) state that startups face the liability of newness and smallness. Startups are often confronted with the lack of necessary resources (Alvarez & Barney, 2001).

Through their smallness, new ventures tend to be not able to stay in business during periods of poor performance (Aldrich & Auster, 1986). Startups strive to overcome the liability of newness and smallness by cooperation with the suitable organization (Partanen et al., 2014). Cooperation with large corporations can overcome the liability of newness and smallness (Bouncken et al., 2015). Bogers (2011) states that engaging in open innovation is necessary to overcome their liability of newness and smallness. The limited financial, physical, human resources and the lack of reputation hamper startups capabilities to establish and scale their products. Startups often lack employee commitment, knowledge of their environment and working relationships with customers and suppliers (Baum & Silverman, 2014). As competition and time is important for innovation, startups do not necessarily have the time to build up a reputation and to grow by themselves. They struggle to develop from technological driven customers who enjoy their products, to real customers using the products due to economic aspects (Peres et al., 2010). They face the challenge to bring innovations successful into the market (Gaba & Bhattacharya, 2012). Every new entrepreneurial company has to cover their normal financial requirements, additional to the R&D and product development expenditure (Manigart & Struyf, 1997), which is an essential requirement of success

(Tech, 2018). This might be especially the case in areas where intensive R&D is necessary. Moore (1993) states that one of the significant problems is the absence of financial resources of startups. In addition to VC and CVC, startups can be financed by personal savings from entrepreneurs (bootstrapping), bank loans, business angels, sponsorships, and crowdfunding. Bank loans, in general, are costly due to limited track records and are scarce for early-stage startups (Schramm & Carstens, 2014).

Business angels are mostly wealthy individuals providing financing at the early stages of startups (Sudek, 2006). The angel investors begin to start to syndicate in investor groups and networks (Sohl, 2016). Complementary, startups can apply for sponsorships, e.g., from universities and governmental entities who might offer free office space, monthly salary, research facilities, and funding. Startups also finance their activities through bootstrapping. Bootstrapping is used frequently by German startups (Kollmann, 2016). Lastly, crowdfunding can be used by startups, where entrepreneurs raise external financing from a larger group of people providing many small amounts of investment (Belleflamme et al., 2014; Vulkan et al., 2016). The source of financing influences startups' strategic freedom, as external equity is connected to reporting and responsibilities to investors (Neumann et al., 2019). The funding amount and the interconnected obligations are crucial for startups and can decide over the success and failure of their business. Therefore, a good capital supply for industries and markets, should promote entrepreneurial activity and increase the number of startups. The obligation of reporting and alignment of interest of startups and investors need to be considered when choosing to finance. The startups need to consider carefully what source of funding suits their needs and whether potential investor shares a common interest (Tech, 2018). In addition to financial resources, startups can gain access to networks, production, and distribution facilities through cooperation with corporations (De Groote & Backmann, 2020). In order to validate their products startups might need to gain access to

production facilities. Furthermore, they might need increasing their sales and scale their business. Moreover, startups have to grow and acquire customers from scratch, similar to their business relationships. As startups face different challenges depending on their maturity stage, products, and resources, various forms of cooperation are possible and have to be anticipated. Ideally, the cooperation contributes to the generation of synergies by bundling complementary resources (Gassmann et al., 2010).

Along with financial and strategic resources, startups can profit from media attention through cooperation. Through cooperation with established partners, trust, and reputation in the startup are signalized. Paying customers legitimate startups helping them to gain additional customers (Kurpjuweit & Wagner, 2020). Stuart et al. (1999) state that investments and non-investment cooperation with startups can signal the market a certain degree of trust and positively impact their reputation. Therefore, startups can increase their market visibility through reputable investors and cooperation partners. The cooperation can be a chance for startups to overcome liabilities and enable them to improve their products and to commercialize them. Hogenhuis et al. (2016) declare that different motives, challenges and risks can be associated to cooperation.

As cooperation and funding can offer opportunities for startups, the awareness of possible threats of cooperation should be considered. Cooperation can lead to purloin of intellectual property (Alvarez & Barney, 2001). The fear and discussions about intellectual property rights can lead to asymmetries and delays of cooperation (Minshall et al., 2010).

The startup might be used for inputs and idea generation by their cooperation partner, who is acting only in his self-interest. Furthermore, the anticipated synergies can turn out not to be beneficial for both parties and use up essential resources for the startups. Startups challenge is to assess the true motives of established organizations, initiating a cooperation (Katila et al., 2008), often failing to state their customer value proposition (Wouters et al., 2018). Additionally, cultural differences and

organizational processes can prevent successful cooperation. The corporations are sometimes restrictive by their organizational structures, which could be related to administrations and regulations of corporations hindering cooperation activity.

Corporations purchasing processes are often very demanding, leading startups to face difficulties to meet all the requirements (Zaremba et al., 2017). Forrest (1990) states that startups could lose control of their operations caused by cooperation. The cooperation possibilities should be carefully considered by startups, as financial or strategic partnerships can be beneficial or negatively afflicted, as cooperation bear risks of failure and require a substantial amount of startups resources. The different forms and ways to cooperate influence innovation performance. Baum et al. (2000) find a positive relationship between innovation and the diversity of cooperation in the biotechnology industry. This finding argues in favor of more cooperation partnerships, as it might grant access to different technologies and resources.

Startups might choose cooperation partners based on their needs as they fulfill different requirements. Universities tend to be suitable for more research-driven and explorative innovation (March, 1991). In contrast, exploitative innovation is more connected to operating corporation partners (Shaw, 1994), to scale, improve, and launch products.

The perspective and challenges of corporate-startup departments and CVC are described. Consequently, the survey shows the perspective of startups regarding their aims for cooperation with corporations. The corporate-startup programs increased over the years, and the following statistics give insights into startups operating in Germany.

## Chapter 8

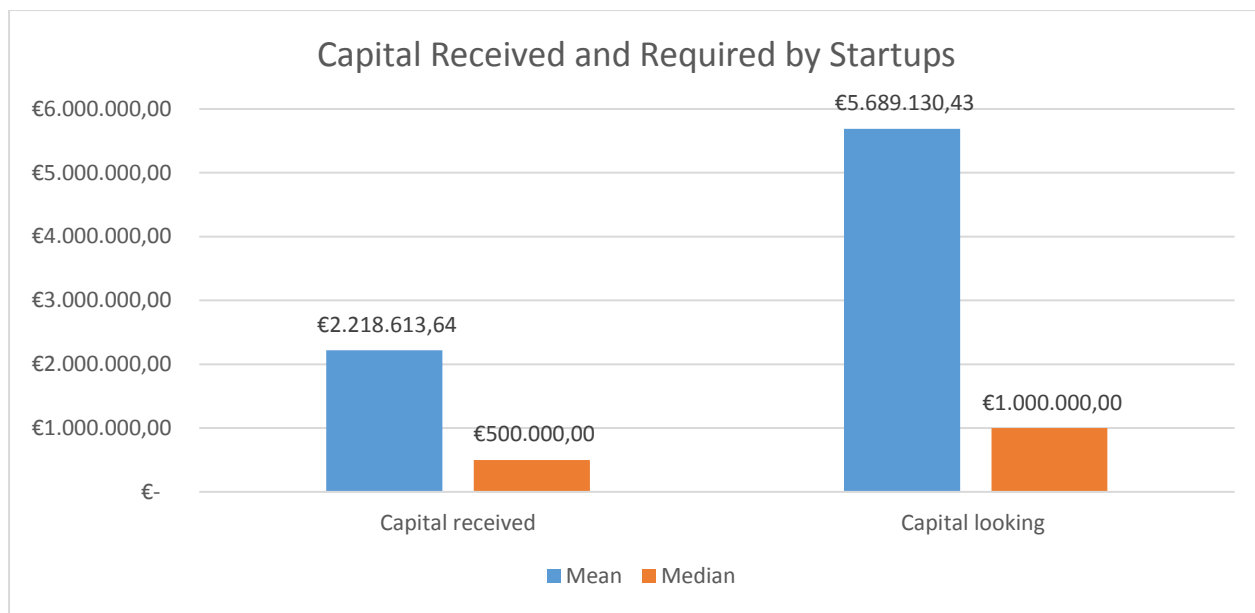
### 8.1 Analysis of Startups operating in Germany

**Source of Startup Financing Frequencies**

		Responses		Percent of Cases
		N	Percent	
Source of Financing	Business Angel	51	27.4%	51.5%
	Bootstrap	45	24.2%	45.5%
	VC	29	15.6%	29.3%
	Sponsorship	20	10.8%	20.2%
	Other	18	9.7%	18.2%
	CVC	10	5.4%	10.1%
	Bank Credit	7	3.8%	7.1%
	Crowdfunding	6	3.2%	6.1%
Total		186	100.0%	187.9%

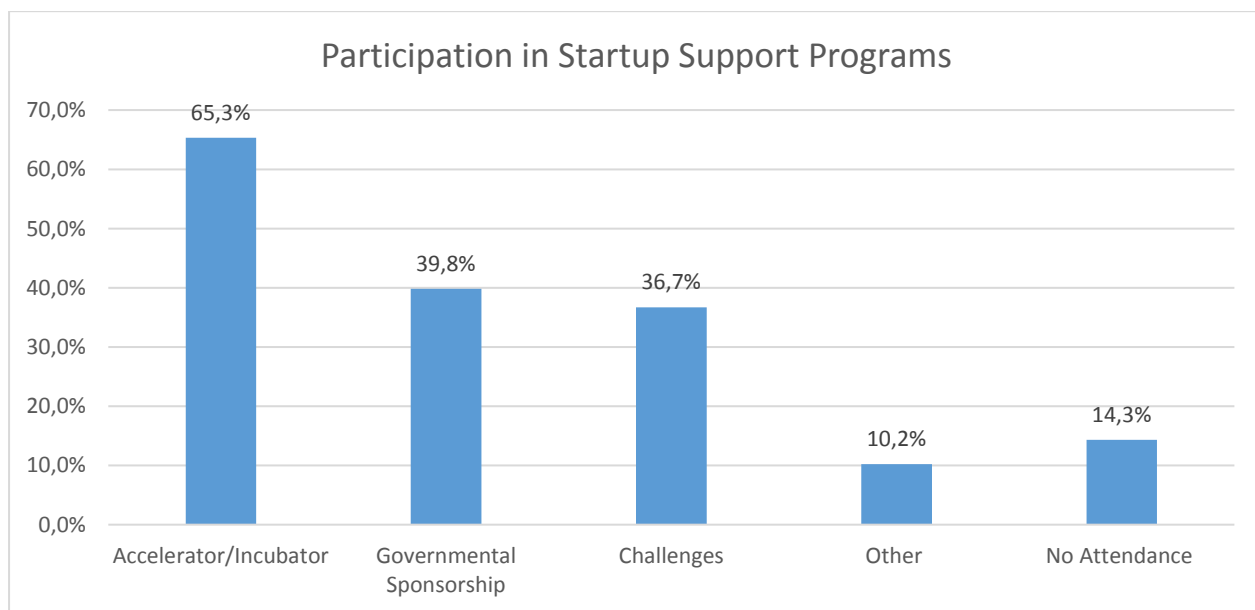
**Table 4.** Source of Startup Financing

In Table 4 the distribution of startup financing is shown. The question was structured as multiple response questions, because startups often use more than one financing method. We can observe that business angels finance the largest part of startups with 51.5 %. Bootstrapping is the second largest fraction of financing, accounting for 45.5%, followed by VC 29.3%, sponsorships 20.2%, other 18.2%, CVC 10.1%, bank credit 7.1%, and crowdfunding 6.1%.



**Figure 23.** Capital received and required by Startups

The capital received and capital required is shown in Fig 23. The mean and median are distinguished as large outliers of investments received, highly influence the mean value. Therefore, the median might be more representative concerning capital requirements. The median capital received is €500,00.00 and capital looking for €1,000,000.00.





**Figure 24.** Participation in Startup Support Programs

Fig 24 shows that over 65.3% of the startups participate in accelerator programs, 39.8% make use of sponsorships, 36.7% attended challenges, 10.2% other, and only 14.3% did not take part in any startup support programs. It is observable that the percentages do not sum up as individual startups attend more than one support program. Notably, large fractions of startups take part in startup support programs.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Network	99	1	7	5.60	1.659
Funding	99	1	7	5.37	1.614
Reputation	99	1	7	4.70	1.699
Gain a large customer	99	1	7	4.43	2.016
Brand Awareness	99	1	7	3.80	1.660
Access to facilities	99	1	7	3.79	1.662
Technical Knowledge and Expertise	99	1	7	3.48	1.680
Operational Involvement	99	1	7	3.36	1.460
Valid N (listwise)	99				

**Table 5.** Importance of Factors to attend Startup Support Programs

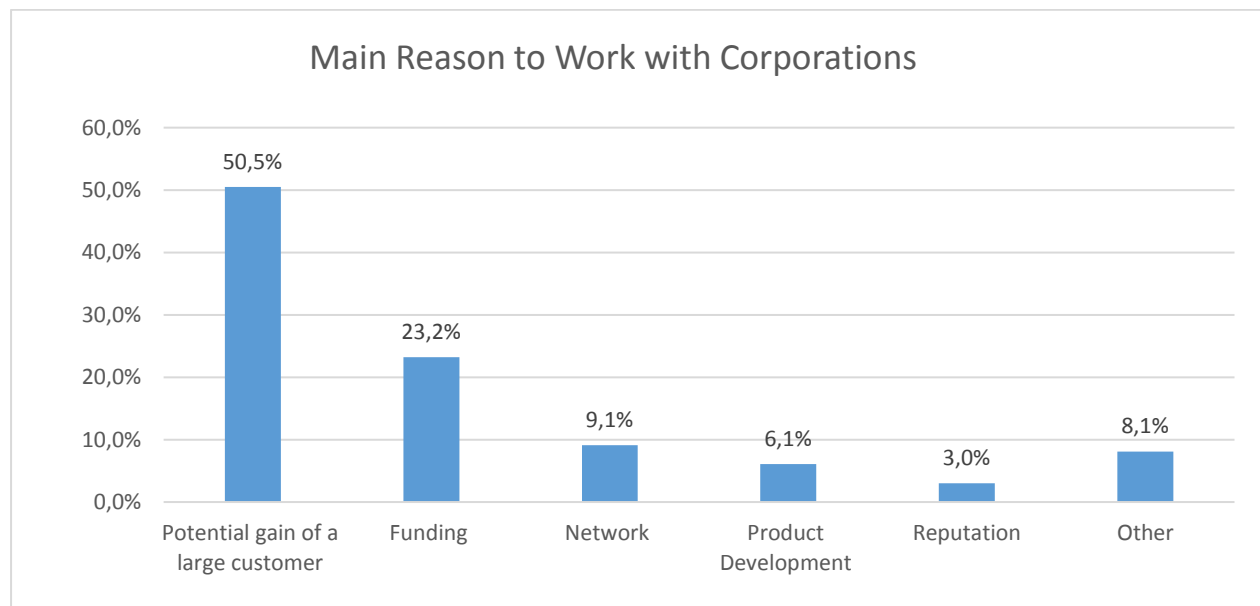
Table 5 shows the relative mean importance of startups concerning support programs. The highest mean value is associated with the network with 5.60, followed by funding 5.37, reputation 4.70, gain a large customer 4.43, brand awareness 3.80, access to facilities 3.79, technical knowledge, and expertise 3.48, operational involvement 3.36.

### Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Operational Support of Investors	99	1	7	3.92	1.589
Keep the majority of shares	99	1	7	5.51	1.637
Investors Network	99	2	7	5.61	1.276
Investors Reputation	99	1	7	5.03	1.508
Strategic Synergies	99	2	7	5.08	1.462
Valid N (listwise)	99				

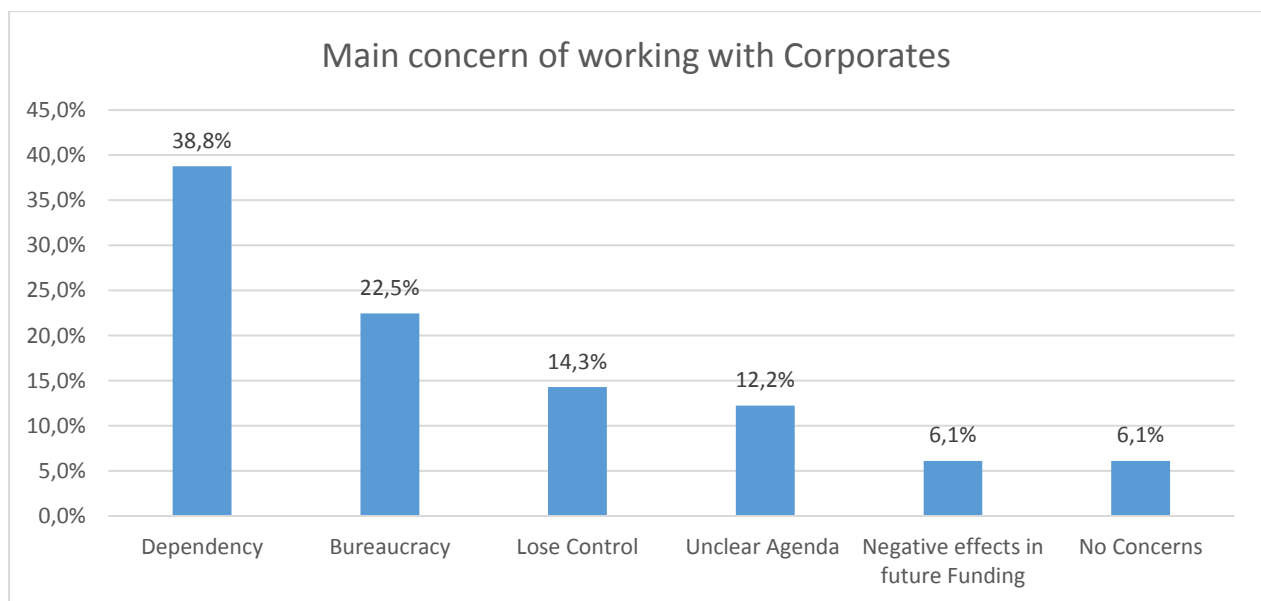
**Table 6.** Importance placed by Startups when accepting CVC Investments

The most important requirement for startups when accepting an investment from CVC is the network provided by investors showing a mean value of 5.61. The other factors perceived to be important are to maintain the majority of shares of 5.51, strategic synergies 5.08, and investor reputation 5.03. The operational support is not perceived as important, showing a mean value of 3.92.



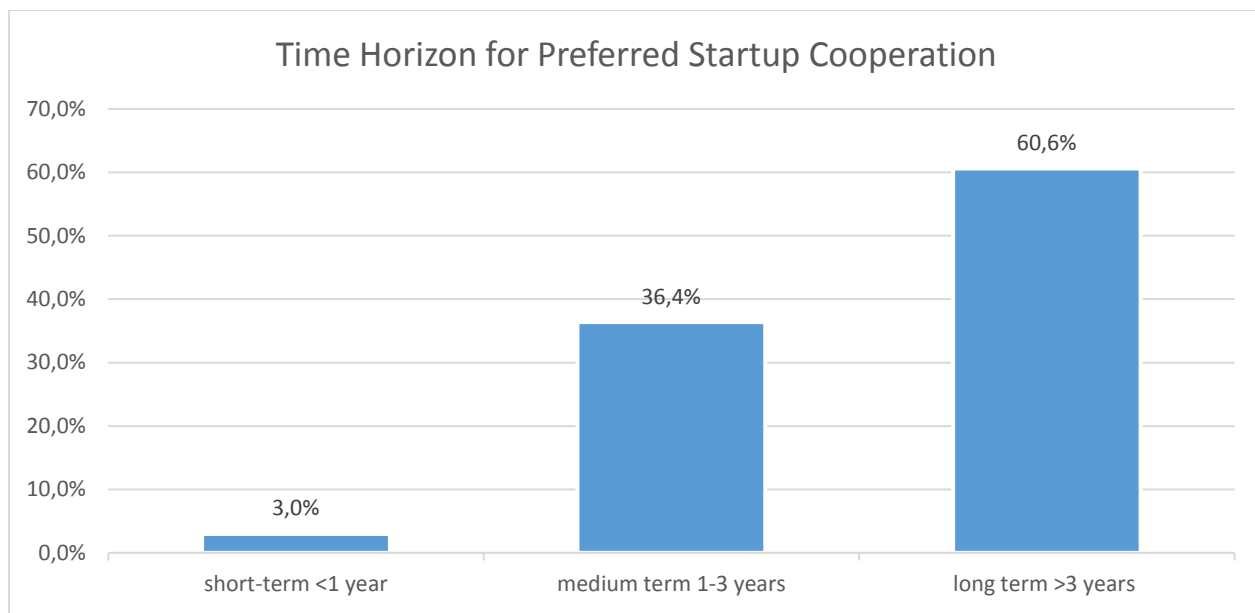
**Figure 25.** Main Reason to work with Corporations

The main reason for startups to work with corporations is the potential to gain a large customer. In total, 50.5% regard that as their main reason to engage and work with corporations, followed by funding 23.2%, network 9.1%, product development 6.1%, reputation 3.0%, and other 8.1%.



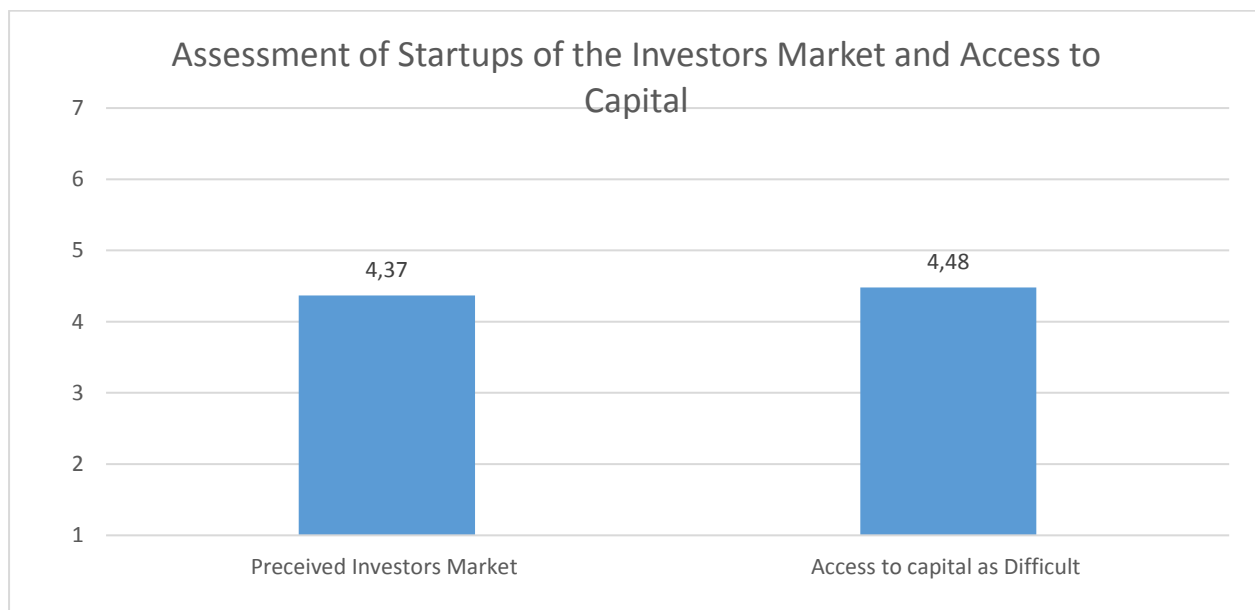
**Figure 26.** Main Concern to work with Corporations

The greatest concerns for 38.8% of startups to work with corporations is dependency, followed by bureaucracy 22.5%, lose control 14.3%, unclear agenda 12.2%, negative effects on future funding 6.1%. There are 6.1% of the startups indicating that they have no concerns about working with corporations.



**Figure 27.** Time Horizon for preferred Startup Cooperation

Fig. 27 shows the preferred time horizons from startups concerning corporate-startup cooperation. In 60.6% of the cases, startups prefer long-term startup cooperation's over three years, 36.4% medium-term from 1-3 years, and 3% short term.



**Figure 28.** Assessment of Startups of the Investors market and access to Capital

Startups assessed the current investors market in Germany for startups on a Likert-Scale for 1-7. The resulted mean value for the perceived investors market is 4.37, which indicates that startups perceive the current investors market as good. However, surprisingly, even though there should be sufficient capital in the markets, the access to capital remains difficult for the most startups indicated by the mean value of 4.48.

## **8.2 Discussion**

Startups often make use of more than one source of financing and might explain the large fraction of bootstrapping as source of financing in Table 3. Startups, in particular at the beginning of the founding process, might use their savings to start their entrepreneurial activity. Cotei and Fahrat (2017) describe that startups with innovative products tend to use and need more external capital financing, like VC or angel investors. The responded startups are financed by 29.3% by VC and 10.1% by CVC investments, implying and underlining a larger share of VC presence compared to CVC.

Corresponding startups value their different importance of support factors of CVC investments, resulting in the lowest mean value of importance associated with operational support. The results indicate that startups might want to profit from investors' reputation, network, and synergies but keep the majority of shares and remain operational independent.

The main reasons, indicated by 50.5% of startups, to cooperate with corporations is the potential to gain a large customer, 23.2% to receive funding, and 9.1% is to use corporations' network. A study of KPMG (2015), in comparison to startups in the Netherlands, reports that 65% want to gain access to the market, 54% aim for capital funding, and 54% want to expand their sales network

when cooperating with corporations (Lindgreen et al., 2015). Amongst access to market and expand sales network, capital funding seems to be an important factor for startups. The results based on a multiple response question and therefore distributes the individual importance differently. These results may suggest that investments in startups are not urgently necessary for startup cooperation, as the majority seem to be mainly driven by other factors. The factors about the perceived importance for startup support programs are the provided network and funding, which is contradicting the results regarding the primary purpose of cooperation with corporations. One explanation might be that funding is important as it shows a certain degree of corporate commitment. Besides, corporate-startup programs might be used to gain access to resources without clear business propositions. However, to create an attractive startup support program, those factors might be necessary for corporations when designing their startup program.

George (2018) states that established firms are more likely to engage in opportunistic behavior when cooperating with small and new firms. The cultural differences might prevent cooperation from realizing their full potential (Doz, 1988) or even be successful. This fear might be reflected by the greatest concerns of startups during cooperation. They are mainly concerned about dependency, increased bureaucracy, and the loss of control due to cooperation. Dushnitsky and Shaver (2009) express that startups should be cautious before entering cooperation with corporations.

The investors' market is perceived as good, with a mean value of 4.37. However, access to capital is regarded as difficult, with a mean value of 4.48. The synergies between corporations and startups exist in theory. Weiblen and Chesbrough (2015) claim that corporations are hard to target by startups, and cultural differences, as well as different working behaviors, can complicate cooperation.

## **Chapter 9**

### **CVC necessity for Startup Cooperation**

The different startup cooperation modes are described, following different corporate strategies to cooperate with startups. The question arises whether investments of corporations in startups are necessary; the survey examined whether startups prefer CVC or corporate cooperation without investment.

CVC investments can enable important insights into the development of a new technologies and impact corporation's awareness and thinking (Maula et al., 2013) The number of different startup programs and initiatives increases, and engage in open innovation by screening competition and market development (Brigle et al., 2016)

The investment in startups has different implications. The startup receives capital from corporations in return of shares, so ownership is transferred. This ownership transfer shall lead to share information and set up work relations, to make use of or develop synergies. High costs, as the cost of capital, organizational effort and monitoring are associated with investments.

Investments can enable access to startups in need of funding, which are not operationally ready. The ownership transfer can serve as collateral for corporations to grant startups access to their resources (Park & Steensma, 2012).

However, value-adding startups should have access to sufficient funds of capital through traditional VC financing, especially in times of economic well-being with plentiful VC supply. The financial focus cannot be substituted by corporate-startup initiatives, as CVC firms act as a VC fund aiming for ROI. An alternative to setting up a financial focused CVC is corporations investing in external VC funds.

On the one hand, corporations can profit from experienced autonomous investment entities, where investments are undertaken without costs to own organizational structure and human resources. The VC market offers field-oriented funds specialized in certain areas. On the other hand, corporations have less control over investment decisions and need to compensate VC funds through management and investment fees. There has to be a trade-off between corporate's capabilities and resources available to invest in external VC funds or establish an own CVC unit. VC funds spend considerable effort and time to filter quality and promising signals from startups (Knockaert & Vanacker, 2013) and can ensure some degree of quality. Startups that are not able to get access through VC funding should be carefully considered as a potential cooperation partner. The VC funded startups could be used as one source of potential cooperation partners.

Based on the definition of Chesbrough (2002), strategic CVC focus should increase sales and profitability of corporations, arising the question of whether investments are necessary, as corporate-startup programs exist. Several corporate-startup initiatives as incubators, accelerators exist, which can substitute CVC through specified startup cooperation. Cooperation on a project base can verify quality and value generation. The corporations, as a large customer for startups, could and should be able to ensure project-based financing through process generating turnover. Napp and Minshall (2011) express that the highest synergy potential exists between the portfolio company and the corresponding business unit of the company and not between the CVC firms or the company as a whole. Startups with established customers can show turnover and business progress. These is observable by VC and possible generate access to funding.

The strategic investment focus was differentiated in Chapter 3 by the exploitation and exploration of strategic focuses. Primarily the focus on exploitation strategy by corporations might be substituted by startup initiatives. If a startup proves itself as a valuable partner in operations and quality, corporations could still consider buying it.



Necessarily, minority investment does not give any control over startups and access to technologies. In relation, VC funds use stage investments to get some control, enabling them to request new information and monitor firm performance (Lauterbach et al., 2013), with the ability to discontinue projects.

The explorative focus should give CVC firms early insights into the development stages of new technologies and unfamiliar business fields. Again, minority investments must not necessarily grant corporate access to technology and the critical capabilities of startups. Moreover, investments with explorative focus might not relate to core businesses and exceed industry knowledge of CVC firms. CVC firms invest in startups to favorably acquire new technologies with the potential to substitute corporations core business (Dushnitsky, 2002). In contrast, CVC firms should invest in startups that are operationally related to corporation's business (Ernst et al., 2005). The corporations might be able to offer technology, infrastructure, and capabilities that classical VC funds cannot. VC and CVC compete about investments with the funding amounts offered and their degree of support (Hellmann, 2002). CVC investments are especially beneficial for new firms that need specialized complementary assets (Park & Steensma, 2012). Furthermore, startups may not accept investments from CVC firms as they fear the loss of independence, as corporations may pursue their goals on the costs of the venture. Investments in startups without strategic or operational linkage of corporations do not add any value for shareholders, as they can diversify their portfolio by themselves (Chesbrough, 2002).

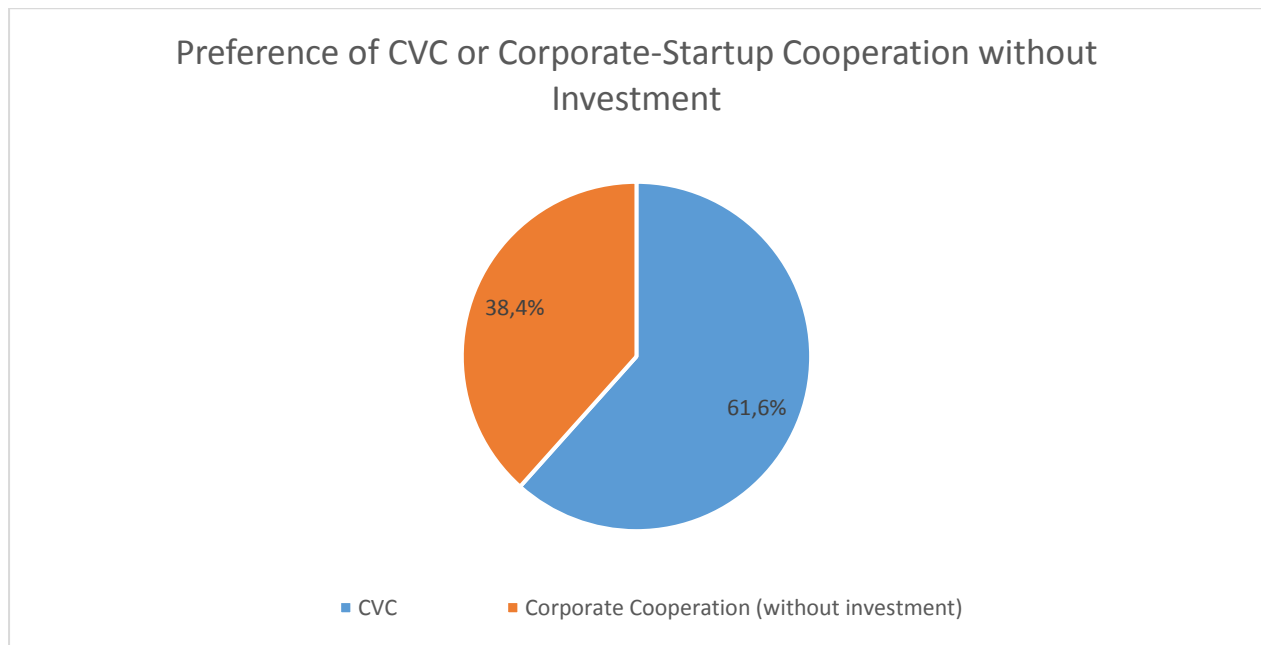
Also, investments in startups often consist of more funding rounds, which need to be considered by investors. New funding rounds are based on the current evaluation of startups. Davila et al. (2003) find that the duration of financing round declines in later stages, whereas the amount of financing increases. Moreover, as VC raises more capital, the investment amounts increases per

round. Dushnitsky and Shapira (2010) indicate that CVC investments focus on later development stages of startups. Gompers and Lerner (2002) find that CVC pay higher valuations than VC firms. Attention and dedication to VC and funding size may encourage the entry of inexperienced VC funds or CVC firms. Sufficient funds have to be available, which could be capital intensive for CVC to reinvest in later funding rounds. The investment in startups might be useful, engaging in intensive R&D for critical technologies of corporations, where project-based financing is not possible. But, as CVC investments are not guaranteeing any control over technologies and capabilities, the benefits are mainly making sense for financial driven goals, as control over a given technology is not guaranteed. Notably, in case of the involvement of public research institutions, where intellectual property rights are inherently problematic. As the study of Meissner et al. (2018) shows, these partnerships are often doomed to fail with negative outcomes and consequences on both sides.

A binary logistic regression was used to find possible factors that influence the decision and general preferences of startups to choose between CVC and corporate-startup cooperation without investments. The different factors tested are the perceived importance of strategic synergies, the importance of reputation gained through cooperation for the startups, whether startups are already CVC or VC funded and whether startups already cooperate with corporates. In addition, the market readiness of startups is a tested factor, which might influence startups decision between CVC or startup cooperation without investment.

The perceived importance of strategic synergies of startups might differentiate the preference of CVC and corporate-startup cooperation without investment, as an investment in startups might create greater commitment of corporates and therefore might enable greater strategic synergies between corporations and the startups. As investments might signaling more commitment to startups and may therefore positively influence the reputation of startups receiving an investment.

The development of products can be costly and especially startups in the development stage, might need access to capital and infrastructure to test and develop their product. Therefore, startups with low market readiness might tend to choose CVC, due to high development cost and greater uncertainty. Startups who received CVC investments have made their experience with CVC investments. Positive experiences with CVC of startups may increase the preference of choosing CVC over corporate-startup cooperation. The binary regression tries to explain the impact of these factors on the probability of choosing CVC over corporate-startup cooperation without investment.



**Figure 29.** Preference of CVC or Corporate-Startup Cooperation without Investment

The question of whether startups prefer CVC or startup cooperation without investments is indicated in Fig. 29. In total, 61.6% of the startups prefer CVC to 38.4% who prefer corporate-startup cooperation without investments.

The selected factors that might impact the decisions of startups are tested in the following with a binary logistic regression. The dependent variable is binary, so whether startups prefer CVC are coded as 1 and corporate cooperation without investment as 0. The different factors which might

influence startups' decisions were tested for correlation. The factors included in the model are: the perceived importance of strategic synergies (*ImpStrategicSyn*) and of reputation (*ImpReputation*) of the startups originated to cooperation, startups that are already VC or CVC funded (*VCorCVCfunded*), startups that already cooperate with corporations (*CooperatewithCorporations*) and startups with a product stage that is market-ready (*MarketReady*). In order to run the regression, all variables were coded as dummy variables (0-1).

### Block 0: Beginning Block

Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.473	.207	5.245	1	.022	1.605

**Table 7.** Variables in the Equation Block 0: Beginning Block

Table 7 shows the coefficient of the constant  $B_0$ , showing that the constant is a significant predictor of the outcome, on the accuracy rate of 61.6% with the p-value of 0.022.

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	18.923	5	.002
	Block	18.923	5	.002
	Model	18.923	5	.002

**Table 8.** Omnibus Tests of Model Coefficients

### Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	112.927 <sup>a</sup>	.174	.236

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

**Table 9.** Model Summary

Hosmer and Lemeshow Test			
Step	Chi-square	df	Sig.
1	3.016	8	.933

**Table 10.** Hosmer and Lemeshow Test

The Omnibus test shows a p-value 0.002, indicating that the model fits the data significantly better than the 0 Model with no predictors. Table 10. shows a p-value of 0.933, indicating that the model fits the data.

Variables in the Equation							
							95% C.I. for EXP(B)
		B	S.E.	Wald	df	Sig.	Exp(B) Lower
Step 1 <sup>a</sup>	VCorCVC funded	1.536	.553	7.712	1	.005	4.648 1.572
	ImpStrategicSyn	-1.316	.483	7.428	1	.006	.268 .104
	ImpReputation	.470	.491	.915	1	.339	1.600 .611
	CooperatewithCorporations	-1.100	.651	2.859	1	.091	.333 .093
	MarketReady	-.697	.471	2.192	1	.139	.498 .198
	Constant	1.663	.706	5.554	1	.018	5.274

**Table 11.** Variables in the Equation

Table 11 shows the coefficients of the explanatory variables, which indicates the changes in the predicted log-odds for a one-unit change in the explanatory variable when all other explanatory variables remain unchanged. The variable *VCorCVCfunded* has a positive coefficient of 1.536 with a corresponding p-value of 0.005, *ImpStrategicSyn* -1.316 with a p-value of 0.006, *ImpReputation* 0.470 with a p-value of 0.339, *CooperatewithCorporations* -1.100 and p-value of 0.091 and *MarkeReady* -0.697 and a p-value of 0.139.

The results show that *VCorCVCfunded* and *ImpStrategicSyn* are significant, with a p-value below 0.05. This is indicating that if a startup has used VC or CVC financing, it is more likely that they prefer CVC over startup cooperation without investments. Startups who value strategic synergies as important concerning cooperation with corporations, tend to decrease the probability of choosing CVC over corporate-startup cooperation without investment. Startups already cooperating with corporations, reduce the likelihood of startups to select CVC, at a significance level of 90% with a p-value below 0.1. The other variables are not significant.

## **Chapter 10**

### **10.1 Startup Selection Criteria**

VC funds search for potential entrepreneurs and investment opportunities and support them with experience, knowledge, and their network as venture partners (Baum & Silverman, 2004). Bertoni et al. (2016) argue that VC funds are the primary source of selection of high-tech entrepreneurial ventures. The startups selected for investments by VC funds, may develop other capabilities and ensure competitive advantage (Hellmann & Puri, 2002). The support and expertise of VC funds are determining and necessary for startups' support. Gompers et al. (2009) state that the success of

VC funds is related to specialization and knowledge about industries. There are different attributes which can be evaluated for startup investments. Fried and Hisrich (1994) argue that VC funds have their particular way to structure their investment decision-making process.

The success of investments is based on the performance and financial return of their portfolio startups. The pre-investment stage, finding and selecting startups, and the post-investments stage. During the post-investment phase, startups are monitored and supported by VC funds. Baum and Silverman (2004) discuss whether VC funds are picking winners or building them. Different strengths and skills are characterizing various VC funds, leading to a diverse and extensive heterogeneous VC environment. Therefore, selection criteria and mentoring abilities and strategies are distinctive among VC funds. Nanda et al. (2020) suggest that performance persistence of VC is not based on the superior selection process, but instead to the initial success of the VC company.

The geographical distance might be of importance for selecting startups, if, e.g., excellent management expertise and support are necessary and need to be provided by VC funds. The skills and qualities of VC funds, required by startups, depending on the development, maturity stage, management skills, industry specification, and many other characteristics influencing the performance of startups and therefore define individual challenges. Aldrich and Auster (1986) describe obstacles often faced by young companies, such as lack of employee commitment, industry knowledge, missing working relationships, and little funds to sustain periods of poor performance. Those obstacles and difficulties make it hard to assess and to evaluate startups.

In the case of no records of accomplishment and performance data, investors try to assess the value and the potential of future performance (DiMaggio & Powell, 1983). Duisters et al. (2011) argue that the selection process is conducive to the success of cooperation. The attractiveness of the

industry, quality of founders, and top management and external network positively influence the valuation of startups in early development stages (Miloud et al., 2012).

The basis of successful startup selection and their evaluation by corporations, should be necessary market knowledge and technical expertise of corporate employees, with the right network enabling to scout and identify the right startups.

Startup cooperation's vary as corporate goals and aims differ and need to be considered for their startup selection. The investment selection and allocation of startups are based on the decision of external resource holders (Aldrich, 1999). The investment selection of VC funds is known for good selection expertise and might attract other investors (Megginson & Weiß, 1991). VC backed startups tend to outperform non-VC backed ones (Sandberg, 1987). The support and monitoring of VC funds can assist startups in their development to a great extent. This section focuses on the selection criteria of startups of corporate-startup initiatives.

Anderson (1999) expresses that VC investment is commonly regarded as the most critical form of capital. Due to the lack of working experience, startups face several challenges, such as industry knowledge and customer relationship (Baum & Silverman, 2004). Hoenig and Henkel (2015) describe that due to limited assets observable at time of valuation, alliances and team experience can be signals of startups quality. High information asymmetry and risk associated with limited information about startups' business performance, selection criteria and evaluation build the foundation of successful cooperation. Hall and Hofer (1993) find startup selection criteria important, as VC backed ventures show higher valuations than new ventures in general.

Based on the experience at Volkswagen and the valuation of startups, different parameters are identified for corporations' startup selection criteria.

The assessment of quality and the perceived potential of success is dependent on different criteria evaluated by corporate departments and CVC. The different importance of the selection criteria of



CVC firms and corporate-startup departments are shown. The valuation of startups' economic situation is challenging for investors and entrepreneurs (Quindlen, 2000). Additionally, firms' assets are often highly specific and intangible (Gompers & Lerner, 2001). Valuations based on different assumptions can vary considerably by various experts (Waldron & Hubbard, 1991).

The founding team is an essential indicator for the success of a startup based on their academic background, work-experience, founding experience, and their level of seniority. Based on the experience made of the founding team, a personal track record can be evaluated. Those factors indicate the specific potential and capabilities of operating startups successfully. In privately funded ventures, the general ability and execution skills of CEOs are related to the performance (Kaplan et al., 2012). Startups might often be at an early stage of their business; therefore, changes in their orientation and business model are not rare. The arising challenges during the startups' development process can be various and founding experiences or educational backgrounds can be of great value to solve and overcome those challenging tasks. MacMillian et al. (1985) find that VC funds valuing and considering the founding team in their evaluation process, as their characteristics offer insights into the quality of the startup. Previous entrepreneurial success is an important criterion on which VC firms focus when sourcing potential new investments (Gompers et al., 2010). The background of the founders can impact the search orientation and knowledge transfer of a company by transforming ideas into innovative options, which can affect the innovation outcome of the company (Hsu & Lim, 2013; Le et al., 2013). The size and composition of the founding team, industry experience and level of education can increase startup valuation (Wasserman, 2017).

Prior founding experience, with high financial returns of previous startups, is assigned to higher valuations for their new venture (Hsu, 2007). Wasserman (2017) find a positive relation of

founding experience associated with a higher valuation. In contrast, Gompers et al. (2010) find no relationship of higher valuation related to successful serial entrepreneurs.

The valuation criteria can be classified into two segments, the firm-specific capabilities market and industry specifications the startup is operating. The identified valuation criteria are based, amongst other things, on the practical experience of the author.

<b>Descriptive Statistics</b>					
	N	Min.	Maxi.	Mean	Std. Deviation
Founding Experience	25	1	7	4.84	1.491
Academic Background	25	1	7	3.44	1.446
Working Experience	25	3	7	4.80	1.118
Personal relationship	25	1	7	3.84	1.864
References of the Startup	25	2	7	4.72	1.400
Seniority level	25	1	7	3.52	1.558
Market readiness	25	2	7	4.96	1.369
Media Attention	25	1	7	3.56	1.660
Market Access	25	2	7	4.72	1.815
Financial Return	25	2	7	4.20	1.443
New Technology	25	3	7	5.76	1.300
New Products	25	1	7	5.80	1.500
Talent Attraction	25	1	7	3.56	1.685
Regional distance (proximity)	25	1	7	2.80	1.633
Concrete Use Cases	25	4	7	6.28	.891
Valid N (listwise)	25				

**Table 12.** Importance of Startup Selection Criteria of Corporate-Startup Departments

For CVC and corporate-startup departments, the importance of startup selection criteria is developed on a 7-point Likert-Scale. The mean value of the importance of startup selection characteristics for corporate-startup departments is shown in Table 12. and for CVC in Table 13.

The importance of team characteristics is investigated by different importance measures related to the founding team by academic background, founding experience, working experience, and personal relationship to the founders.

The lowest value of corporate-startup departments associated with team characteristics is academic background, with a mean value of 3.44, followed by the personal relationship to the founders 3.84. Substantially more importance is associated with work-experience 4.80 and founding experience 4.84. There are several different development stages of startups and therefore the study distinguished between market-ready and not market-ready. The term market-ready defines a product, ready to integrate. The correspondent mean value of importance is 4.96. The geographical distance shows with 2.8 the lowest amount of corporate concern.

The values of corporations focus and targets of startup cooperation, in this study include, financial return 4.2, media attention 3.56, market access, 4.72, new technology 5.76, new products 5.8, and talent attraction 3.56.

There is a clear tendency of corporate-startup departments placing great importance to find new technologies, new products, and gain access to markets. Concrete use cases for corporations show the highest overall mean value of 6.28 and is the perceived most crucial characteristic of startups for corporate-startup departments in this study. This can imply that for corporate departments, acute problems, and challenges of corporations should be solved by startups, with new products and technology. Moreover, concrete use cases might be of great importance to get the necessary organizational encouragement by functional departments and establish a positive reputation associated with startup work.

Descriptive Statistics					
	N	Min.	Maxi.	Mean	Std. Deviation
Founding Experience	14	4	7	5.64	.842
Academic Background	14	1	7	4.14	1.460
Work Experience	14	4	6	5.36	.842
Personal Relationship	14	2	7	5.64	1.499
Reference of the Startup	14	3	6	5.21	.975
Interpersonal Chemistry	14	2	7	5.29	1.267
Market Readiness	13	2	7	5.23	1.423
Possible Market Size	14	2	7	5.21	1.672
Market Competition	14	1	7	4.86	1.562
Scalability of Product	14	4	7	6.29	.914
Innovativeness of Product	14	4	7	5.57	1.158
Quality of Product	14	4	7	5.57	.852
Profitability of Startup	14	1	5	2.57	1.284
Growth Potential of Startup	14	4	7	6.07	1.072
Potential of Return on Investment	14	2	7	5.57	1.604
Strategic-Fit	14	1	7	5.29	1.978
Venture Capital Support Startup	14	2	7	5.29	1.437
Referrals	13	4	7	5.38	.870
Valid N (listwise)	13				

**Table 13.** Importance of Startup Selection Criteria of CVC

The criteria investigated and shown in Table 13 slightly differ for CVC and corporate-startup departments. The different selection criteria have different objectives due to the investment and the more project-based focus. However, there are several intersectional criteria for CVC and corporate-startup departments.

The team characteristics are comparable with the corporate-startups' departments with the resulted mean values of 4.14 for academic background, founding experience 5.64, work-experience 5.36,

and personal relationship with the startup 5.64. The CVC firms value team characteristics comparable to corporate-startup departments with the differences of greater importance on personal relationships to the startups and overall higher mean values for team characteristics. The importance of the references to the startup shows a mean of 5.21 and market readiness of 5.23. The relative importance of product characteristics is divided into scalability 6.29, quality of product 5.57, and the degree of innovativeness 5.62. The relative importance of product characteristics may give insights into factors, which may attract CVC investment. The degree of scalability might be of great importance enabling high growth and return potential of investments.

The market size 5.21, market competition 4.86, profitability 2.62, growth potential 6.07. In relation to strategic fit 5.29 and the potential of return on investment 5.57 show comparable mean importance.

Interestingly, the profitability of the startup is not of great importance to potential investments. This may be the case as for strategic value generation nor financial return, the profitability is considered in the pre-evaluation of investments and therefore paid by the investors. As the different characteristics of CVC and corporate-startup departments differ, there might be additional differences of corporate-startup departments and CVC dependent on their focus and startup programs used.

CVC firms were additionally requested to rank seven characteristics by their importance of startups from 1-7, where one is not so important and seven very important.

Each value could only be assigned to one category. The results are shown in Tables 14-16. The values indicate that for CVC firms, the team of the startup is the most important factor in their evaluation process with a mean of 5.93. Followed by market potential 4.5, unique opportunity 4.43, product 4.21, gut feeling 3.21, financial situation 3.14, trusted referral 2.57. The ranking results of

the Friedman test are significant, with a value of 0.001 and reject the null hypothesis that there is no difference in ranking investment criteria.

## 10.2 Friedman Test

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Team of the Startup	14	5.93	1.072	3	7
Market Potential	14	4.50	1.951	2	7
Unique Opportunity	14	4.43	1.651	1	7
Product	14	4.21	1.888	2	7
Gut feeling	14	3.21	1.626	1	7
Financial Situation	14	3.14	2.381	1	7
Trusted Referral	14	2.57	1.555	1	6

**Table 14.** Friedman Test of Startup Selection Characteristics

Ranks	
	Mean Rank
Team of the Startup	5.93
Market Potential	4.50
Unique Opportunity	4.43
Product	4.21
Gut feeling	3.21
Financial Situation	3.14
Trusted Referral	2.57

**Table 15.** Mean Ranks of Startup Selection Characteristics

Test Statistics <sup>a</sup>	
N	14
Chi-Square	22.776
df	6
Asymp. Sig.	.001

a. Friedman Test

**Table 16.** Test-Statistics Friedman Test

The results might indicate that an outstanding team and market potential, are the most critical factors, and could be essential to receive investments from CVC.

Interestingly, gut feeling is more important for German CVC firms than the financial situation of the startup and as a trusted referral. That indicates that the emotions and feelings of investors influence investments. May and Simmons (2001) express that the truth of startup valuation is often guessing.

Ge et al., (2005) find that startups experience higher valuations when (1) startup is operating in high product differentiation and growth industry; (2) the founding team has startup or top management experience; (3) the startup is founded by a team; (4) the startup has external partners. The results are similar to Hill and Power (2001), who report the importance of valuations of VC firms on a rating of five the most important and one the least important. The most important factor was for VC firms the quality of management (4.5), market size (3.8), product quality (3.7), market growth (3.5), competition (3.5), barriers to entry (3.4), companies development stage (3.2) and industry (3.0)

The selection and evaluation of startups are individually different and influenced by many various factors, related to the purpose of startup selection through CVC or corporate-startup departments and their mission. The mean values give insights about the importance placed by corporate-startup departments and CVC firms on startup evaluation and selection criteria. The following conclusion

considers the statistics shown in the dissertation and combines them with the experience made by the author.

## **Conclusion**

Apart from describing the practical experience at Volkswagen, the cooperation between startups and corporations in the German market was investigated. Many past attempts of bringing the corporate and the startup world together had not fulfilled their expectations and were discarded (Weiblen & Chesbrough, 2015). To bring both worlds together, there are several obstacles for corporations and startups to overcome and account for. The challenges from corporate-startup cooperation were described from the corporation and startup perspective.

In the last years, corporations increased their involvement in startup cooperation, as the push of external innovation in corporations makes the interface of startup programs and is a crucial point for organizational success (Weiblen & Chesbrough, 2015).

The departments strategy was described and set in an organizational context. The procedure of establishing startup cooperation including identification, selection, dispatching, and imparting startups was connected to several obstacles.

The sizeable organizational structure made it hard to assess different responsibilities and competencies of functional departments. In addition to that, the commitment of potential internal startup cooperation partners was hard to establish. Moreover, those functional departments were not aware of the tasks and aims that need to be fulfilled for startup cooperation. Therefore, our department struggled to promote and encourage external innovation through startup cooperation in the organization. Promoting startups internally and convincing relevant decision-makers of



Volkswagen took a substantial amount of our departmental resources. A clear strategy of startup cooperation should be necessary for corporations to enhance internal learning and build up expertise.

From the authors' point of view, an essential condition for successful startup cooperation is to create internal alignment and incentives to cooperate with startups. The challenge is to encourage functional departments to actively think about possible innovation and pain points, that might be solved by startups. The functional departments should be open-minded and willing to invest effort and resources into promising startup cooperation.

In addition to internal commitment, the corporations need to gain market knowledge about the startup ecosystem, to be able to differentiate market standards and the assess quality of startups. As the startup ecosystem is growing and competing globally, corporations have to screen and identify substantial amounts of startups (Weiblen & Chesbrough, 2015). Moreover, the organizational design and management incentive structures do not positively affect startup cooperation. The resources spend in startup projects with risky and uncertain outcomes are accounted to the managers initiating those projects. As a result, failing startup cooperation might influence a manager's personal career perspectives. The chances and opportunities related to startup cooperation may not be worth the risk associated to the cooperation attempt. It appears that managers have more to lose with regards to their future career paths. Decision-makers need to establish organizational structure around startup cooperation and decide how innovation will be integrated into the organization.

The corporate governance structure imposes obligations to departments and employees. The innovation process and outcome are uncertain, which leads to incomplete internal contracts. Incentive structures might contradict to a common startup cooperation encouragement and monitoring is difficult, as people tend to have unclear tasks and typically work in team structures.

Radical innovation is very challenging and requires substantial resources and is associated with a high level of risk. This could introduce inefficiency as managers try to preserve resources to follow their responsibilities (Cyert & March, 1963). As a consequence, a high degree of ownership of innovation might be of great importance, so that failures of cooperation are not negatively affecting management careers. Proper incentive and expectation management is essential to avoid unrealistic expectations and insufficient governance structures.

Apart from incentive structures, another reason for not commitment by functional departments could be due to being indifferent, as they were no costs associated to startup solutions. A free service might be used, but not pursued with the necessary commitment. Overall, not requested startup solutions for functional departments showed no real commitment and were not successful at the Ideation:Hub. Consequently, our team for the most part started to work on projects on the request of functional departments and charged them for our services. However, costs prevented functional departments with tight budgets from engaging with startup cooperation.

From the perspective of functional departments, that are facing day to day business challenges, no real incentive or obligation to engage in startup cooperation were set by the top management. Moreover, the opportunity for functional departments was often missing, as necessary resources to react and utilize had to be available. Startup cooperation usually needs human resources and additional budget available.

The budgets for departments are yearly planned, and expenses need to be considered in the planning rounds, which usually take place at the end of the previous year. As a consequence, functional departments typically do not have any budget leftover for unplanned startup projects.

Startups presented to functional departments, who often had no incentives, budget, or human resources led to correspondingly low response rates, questioning the effort invested. The push

of startups into the organization was not successful, as organizational structure and incentives hamper startup cooperation. Besides, startups registered and found by our department got disappointed, as considerable time and little progress with potential functional departments were obtained.

The targeted research by assignments from functional departments was more successful. Based on specific needs, functional departments formulated criteria for possible startup cooperation. The experience and knowledge about startups and our network in the startup ecosystem enabled us to provide customized startup solutions. The research was customized, where search fields and requirements, e.g., geographical distance, maturity stage, and other conditions, were determined. The results were presented to functional departments, with additional support provided during startup cooperation. The cooperation should align startups' and corporations' interests. In the best-case, corporations should define a clear business challenge, cooperation programs, and corporate-startup initiatives with clearly defined responsibilities and targets for the different stakeholders. Early dismissal of not promising startup cooperation saves resources and enables new projects and attempts.

The organizational regulations concerning onboarding, data protection, project relevance need to be considered and fulfilled. In the sense that planning and regulatory hurdles exist and organizational speed to initiate or overcome such obstacles takes time, where startups facing planning insecurity. In general, startups have limited resources and have to consider those in relation to possible outcomes. Therefore, the commitment that justifies their effort should be guaranteed in order to start cooperation.

In the retrospective, a clear mission statement from the top management should have justified the extra effort and risk associated with startup cooperation. With time, Volkswagen established several initiatives of startup cooperation and programs that promote external innovation.

Organizational incentive structure to promote or at least enable startup cooperation has to be set, in order to prevent that managers predominantly act in their self-interest in relation to their career perspectives. Moreover, internal collaboration lacks efficiency, as intradepartmental communication is often missing and different startup programs seem to secretly compete. As a consequence, different initiatives often do not coordinate their activities. Several different stakeholders in large organizations need to be involved and high ownership of innovation is of importance for startup cooperation, the author would bundle startup activities in the organization with a high degree of managerial ownership

From the authors perspective functional departments, which requested startup solutions fell in one of following categories. Firstly, facing extreme challenges desperate functional departments thought startups as the last possible solution. Secondly, they spend the remainder of the annual budgets to secure a similar budget allowance the following year. Thirdly, functional departments want to create value for the cooperation, which was very rare.

The studies of German corporate-startup departments, German CVC, and startups operating in the German market showed different implications for corporate-startup cooperation.

German corporate-startup departments offer a variety of startup channels, where the vast majority place importance on incubator and accelerator programs. Over 50% of corporations attend startup events, employ startup scouts, and make use of VC. Around 20% employ external agencies to engage with startups. The main purposes of corporate-startup departments are to discover new technologies, product development, and digitalization.

The ownership of startup work is allocated at top management level 48% and middle management 32% and only 8% at the management board. The number of startup projects initiated by corporate-startup departments varies from 0 to more than 12 projects. The lifespan shows that most corporate-

startup departments exist between 1-4 years. Time and organizational visibility might be crucial in setting up corporate-startup initiatives.

The majority of corporate-startup departments perceive, higher startup budgets, higher ownership of innovation, lower hierarchies, lower administrative hurdles, and a lower resistance of their workforce as important. The majority, 72%, regard their startup work as successful.

The German CVC market shows different strategic orientations. There are different ownership structures among CVC units, with a small majority structured as separate legal entities. The objectives are to find new technologies and digitalization. This is connected to the high perceived importance of new technologies in the investment evaluation criteria. The investments are regarded as a success based on financial return and strategic fit, with the aim to find new technologies, products, and gain access to markets. Consequently, German CVC objectives are driven to buy access to new products and technology, compared to developing new products or improve processes with the help of investments. The lifespan shows that most CVC entities exist longer than four years, thereby assuming some degree of operational experience and learning. Time is necessary for success, as VC funds take around eight years to show outputs from their investments (Gompers & Lerner, 2000). As CEO alternation is occurring, the strategic orientation of corporations might change more frequently and impact CVC activity. The question of how corporations measure the strategic fit of their investment remains open for further research. There are CVC success stories, like Google and Intel (Rahal, 2014); however, lots of capabilities have to be developed by corporations. The necessity of startup investment has to be considered as investments especially focused on strategic benefits might be obtained by non-equity startup cooperation.

Startups operating in the German market use various sources of financing. The largest proportion of financing is provided by business angels, bootstrapping and VC. The majority of startups

surveyed attended startup support programs, with 65% participating in accelerator or incubator program. The range of programs offered seems to be large and different programs are accepted by startups. To accept an investment, startups placed great importance on investors' network, to keep the majority of shares, strategic synergies, and investors' reputation. The main reasons to work with corporations are the potential to gain a large customer and to receive funding. On the other side, the greatest concerns regarding corporate cooperation are dependency, bureaucracy, and to lose control. Most of the startups prefer and strive for long term business relationships with corporations, defined as greater than three years. The startups assessed the current investors market as good but indicated that access to capital was still difficult.

The startups prefer CVC with 61.6% over 38.4% corporate cooperation without investments. The binary logistic regression showed that if startups are VC or CVC financed, it increases the likelihood of preferring CVC, whereas high perceived importance on strategic synergies from cooperation decreases the likelihood of choosing CVC. The different startup selection and evaluation criteria of corporate-startup departments and CVC are shown. The Friedman-Test shows that CVC firms rank the startup team as the essential factor concerning selection, followed by the market potential.

This dissertation elaborated on the challenges and experiences made at Volkswagen and shows descriptive statistics of the German corporate-startup departments, the German CVC market, startups operating in Germany and their objectives and organizational structure. The central aim of this study was to give new insights into German corporate-startup cooperation with their focuses, structures, and challenges.

## **Limitations**

The dissertation has some weak points. Firstly, the data is obtained by questionnaires and answers are self-reported by respondents. Therefore, biases of reality and self-perception with its desirable responses could occur. Moreover, the accuracy of the data provided could be biased as information is gathered ex post facto. The obtained datasets are rather small, which could lead to biases based on leverage on individual respondents. The different performances from corporate-startup departments should be more closely analyzed, the success of startup projects should be defined and investigated in more detail. Furthermore, CVC investments for corporations should be further investigated. Reasons to invest in startups should be identified and set in relation to non-investment startup cooperation. In addition, more empirical studies, might consider longitudinal research designs and country comparison much more in-depth. As the study from van Veen and Kratzer (2011) show the settlements of corporations made them distinguishable between cooperative ones and competitive ones, even in Europe.

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## Appendix

### Logistic Regression

Case Processing Summary			
Unweighted Cases <sup>a</sup>		N	Percent
Selected Cases	Included in Analysis	99	100,0
	Missing Cases	0	,0
	Total	99	100,0
Unselected Cases		0	,0
Total		99	100,0

a. If weight is in effect, see classification table for the total number of cases.

<b>Dependent Variable Encoding</b>	
Original Value	Internal Value
Cooperation without Investment	0
Corporate Venture Capital	1

## Block 0: Beginning Block

<b>Classification Table<sup>a,b</sup></b>				
		Predicted		
		What do you generally prefer for your startup?		
Observed		Cooperation without Investment	Corporate Venture Capital	Percentage Correct
Step 0	What do you generally prefer for your startup?	Cooperation without Investment	0	38,0
		Corporate Venture Capital	0	61,0
Overall Percentage				61,6

a. Constant is included in the model.

b. The cut value is ,500

Variables in the Equation						
		B	S.E.	Wald	df	Sig.
Step 0	Constant	,473	,207	5,245	1	,022
						Exp(B)
						1,605

Variables not in the Equation					
			Score	df	Sig.
Step 0	Variables	VCorCVCfunded	6,934	1	,008
		ImpStrategicSyn	6,043	1	,014
		ImpReputation	,885	1	,347
		Cooperatewithcorporations	,460	1	,497
		MarketReady	1,082	1	,298
	Overall Statistics		16,744	5	,005

## Block 1: Method = Enter

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	18,923	5	,002
	Block	18,923	5	,002
	Model	18,923	5	,002

Model Summary			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	112,927 <sup>a</sup>	,174	,236

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than ,001.

**Contingency Table for Hosmer and Lemeshow Test**

		What do you generally prefer for your startup? = Cooperation without Investment		What do you generally prefer for your startup? = Corporate Venture Capital		Total
		Observed	Expected	Observed	Expected	
Step 1	1	9	9,241	4	3,759	13
	2	5	6,356	6	4,644	11
	3	6	5,335	4	4,665	10
	4	5	4,060	4	4,940	9
	5	2	1,971	3	3,029	5
	6	4	3,993	7	7,007	11
	7	3	3,367	9	8,633	12
	8	3	1,775	6	7,225	9
	9	1	1,478	11	10,522	12
	10	0	,423	7	6,577	7

**Hosmer and Lemeshow Test**

Step	Chi-square	df	Sig.
1	3,016	8	,933

**Classification Table<sup>a</sup>**

			Predicted		
			What do you generally prefer for your startup?		
	Observed		Cooperaton without Investment	Corporate Venture Capital	Percentag e Correct
Step 1	What do you generally prefer for your startup?	Cooperation without Investment	20	18	52,6
		Corporate Venture Capital	14	47	77,0
Overall Percentage					67,7

a. The cut value is ,500

### Variables in the Equation

								95% C.I. for EXP(B)
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower
Step 1 <sup>a</sup>	VCorCVCfunded	1,536	,553	7,712	1	,005	4,648	1,572
	ImpStrategicSyn	-1,316	,483	7,428	1	,006	,268	,104
	ImpReputation	,470	,491	,915	1	,339	1,600	,611
	Cooperatewithcorporations	-1,100	,651	2,859	1	,091	,333	,093
	MarketReady	-,697	,471	2,192	1	,139	,498	,198
	Constant	1,663	,706	5,554	1	,018	5,274	

### Variables in the Equation

		95% C.I. for EXP(B)
		Upper
Step 1 <sup>a</sup>	VCorCVCfunded	13,747
	ImpStrategicSyn	,691
	ImpReputation	4,191
	Cooperatewithcorporations	1,191
	MarketReady	1,253
	Constant	

a. Variable(s) entered on step 1: VEntureCVC, ImportanceStrategicSyn, ImpReputation, Corporatewithcorporations, MarketReady.



