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Understanding the heterogeneity of corporate entrepreneurship programs

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1 Entrepreneurial activities in established companies

Established companies are facing many challenges in today's volatile world. Profound developments such as digitalization, globalization, and the shift towards more sustainability are drivers of the dynamic and radical changes that characterize the start of the 21st century. For instance, industries such as automotive or telecommunications industries experience or have experienced fundamental changes. The changes are often caused by innovations that are introduced by new market entrants, e.g., Skype and WhatsApp in the telecommunication industry and Tesla with its electric cars.

It seems that the more radical type of innovation, which shows a broad range of manifestations, e.g., business model innovation (see Foss & Saebi, 2017) and disruptive technological innovation (Christensen et al., 2018; Markides, 2006), pose a fundamental challenge for nearly all established companies. At the same time, startups and other new market entrants (often big tech companies, which can be seen as *digital natives*[1]) benefit from disruptive innovation. Even stronger, they drive the fast and radical changes by many times being the first to introduce the innovations. They form the new disrupting market parameters (e.g., Tesla with its electric and software-centered cars) and create new markets (e.g., Apple with its iPad).

Thus, it is not surprising that the subject of *entrepreneurship* is experiencing increasing interest from various actors, such as politicians, investors, and established companies. While politicians see startups as one key element in creating a digital economy, investors are attracted by the rising number of unicorns[2], i.e., the startups valued more than one billion Euro, without being public yet.

For established companies, three prevailing questions are (1) how to collaborate with startups? (2) How to invest in startups? And (3) how to integrate startup-like structures into their own organization?

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[1] The basic concept behind digital natives comes from social science and describes the generation that has been raised with digital technologies. Transferring this concept to the world of companies, digital natives can be understood as companies, which are "raised" with a digital technology in the core of their organization, e.g., Google with its search engine or Amazon with the online shop and cloud services.

[2] The number of tech-intensive startups that can be classified as unicorns has nearly quadrupled within six years from 30 in 2014 to 112 in 2020 (Casartelli et al., 2020).

As a result, the topic of entrepreneurship within established companies is experiencing an increase of interest from researchers and practitioners (Hill & Georgoulas, 2016). The development can be seen as one *managerial tool* that addresses the challenges that come along with the ongoing digital transformation. The radical changes are taking place in nearly all industries.

Comparing the European industry landscape to the U.S., one key difference can be observed when it comes to digital innovation. It is the digital dominance of American companies. European companies are among the world's leading companies in traditional businesses such as automotive, mechanical engineering, and oil/gas industry. In contrast, many digital businesses in the western world are dominated by U.S. companies such as Google, Apple, Microsoft, Amazon, or Facebook (see Barwise & Watkins, 2018). Moreover, most of these companies have in common that they are still comparably young and have scaled in a short period of time from a small startup to a global player.

Established companies face the challenge that they must excel in their current core business while simultaneously creating new, often digital competencies and businesses in order to ensure their competitiveness in a digitalized future. However, there are several reasons why established companies often emphasize focusing on their core business (see Benner & Tushman, 2003; March, 1991). Two examples are: (1) the perception of the higher urgency of day-to-day business and (2) the high level of uncertainty when investing in more radical innovation projects. This leads to the circumstance that they typically excel in creating *process innovation* and *incremental product innovation*, which are strongly related to their current core business. However, established companies struggle with the development of more radical types of innovation that are fully new to the company. Hence, they come along with a higher level of uncertainty and risk (see, e.g., McDermott & O'Connor, 2002; Chandy & Tellis, 2000).

My study is investigating how established companies can effectively use formalized entrepreneurial activities (a) to support their organizational transformation and (b) to maintain their competitiveness in a highly volatile and digitalized market environment (see Teece, 2016; Kuratko et al., 2015). In summary, they both (a) and (b) deal with entrepreneurial activities within an established company. The structure of this chapter is as follows.

Section 1.1 discusses our motivation for the implementation of *entrepreneurial activities*, followed by the relevance of discontinuous innovations in Section 1.2. Then we formulate our problem statement in Section 1.3 and our research questions in Section 1.4. Subsequently, we describe the intended objectives and research methodology in Section 1.5. Finally, we complete the chapter by giving the structure of the thesis in Section 1.6, the managerial relevance in Section 1.7, and the scientific relevance in Section 1.8.

1.1 Motivation for conducting this research

In my research, I am motivated by the continuous changes and progress in our world today. The digital transformation is, in my opinion, more than "just" the 4th industrial revolution. It is a fundamental renewal of our society, which affects every aspect of the private and professional life (see, e.g., Livari et al., 2020; Vial, 2019; Pappas et al., 2018)

Since the second half of the last century, Europe and Germany, as my home country, have experienced continuous growth of prosperity, education, and largely stable political systems. Much of this progress is rooted in its strong industrial landscape, innovative power[3], and economic strength. However, the last two decades (2000 – 2020), which have been marked by ongoing digitization, seem to be running counter to this development (see, e.g., Ambrosia et al., 2020)

As described at the beginning of this chapter, the majority of the companies are leading the digital transformation, e.g., by creating (a) dominant platforms and (b) highly scalable business models. Nowadays, these are startups (or scale-ups), which are less than 20 years old, are primarily based outside of Europe. This crucial role of entrepreneurship and entrepreneurial behavior fascinates me and drives my interest. In this vein, I aim to understand how entrepreneurship can play a role in our European industrial landscape and how it can support a successful transformation of established companies and hence of the entire economy.

1.2 Managing different types of innovation

Innovation is widely recognized as an essential driver of economic growth and the creation of wealth. For companies, innovation is a prerequisite for long-term success and vital to adapt to changing market conditions. However, innovation has multiple facets, and the different types

[3] For example, "Made in Germany" as a global informal standard for quality and innovativeness.

of innovation require different treatments (see Salerno et al., 2015). Established companies typically have their sweet spot when implementing *process innovation* or incre*mental product innovation*. These types of innovation are strongly related to challenges in the core business, e.g., reducing costs or offering improved products. Therefore, they are often referred to as *continuous innovation* as they build on existing competencies and know-how. For reasons of context, we provide a definition of continuous innovation below.

> **Definition 1.1** *Continuous innovation* is defined as all types of innovation that are mainly building on improving or reconfiguring existing competencies, which is mainly reflected in incremental improvements of products and processes.

Continuous innovations can either take place within the organization (process innovation) or on the product level (incremental innovation). The implementation of these continuous innovations typically comes in hand with an improvement or enhancement of the current competencies of an organization.

Besides innovations that count to the "continuous type", there are several additional innovation manifestations, e.g., *business model* innovation, *disruptive* innovation, and *radical* innovation, which have in common that they are different from the innovation in a companies' core business. In some cases, the innovation shows little or no relatedness to the core business, whereas in other cases, the innovations even have the potential to cannibalize current businesses and threaten the viability of the organization. Examples are digital photography for Kodak and the smartphone for Nokia (see Laamanen et al., 2016; Lucas & Goh, 2009). These so-called *discontinuous innovations* are becoming more important as new technologies are applied in the markets that provide functionalities in an entirely different way. The development demands established companies to develop new capabilities and new ways to address or create new types of innovation.

> **Definition 1.2** *Discontinuous innovation* is defined as covering the types of innovation characterized by a higher level of novelty and uncertainty, which mainly requires developing new competencies for their successful implementation.

In contrast to the continuous type of innovation, discontinuous innovations often do not fit into the existing structures and competencies within the company. Moreover, they require a transformation of the organization (or parts of it) for a successful implementation. This *competence-destroying* characteristic is one of the major challenges in the successful

implementation (see, e.g., Gatignon et al., 2002). However, here we remark that the competence-destroying characteristic is not linked with the radicality of technical innovation per se, since even rather simple digital services, e.g., changing the sales process and hence impacting the business model, can lead to this competence-destroying effect. In some cases, rather radical technological innovations do not affect the current competencies, e.g., Apple's iPhone or Amazon's smart voice assistant Alexa.

In addition to the competence-destroying effects of discontinuous innovation, the *different types of learning* behind continuous and discontinuous innovations are posing another challenge for established companies. The creation of continuous innovation is mainly based on optimizing existing knowledge. In contrast, discontinuous innovations require a much higher level of knowledge to be explored. That level is at least new to the company or even new to the world. On top of this development, the underlying learning modes of exploitation (optimizing existing knowledge) and exploration (creating new knowledge) are mutually incompatible and demand different management styles and organizational environments (see Raisch et al., 2009; Benner & Tushman, 2003). These contrasts make it even more difficult for established companies to implement discontinuous innovation parallel to the innovations in their core business.

In general, established companies are largely confronted with innovation regarding products, services, or business models. To cope with these types of innovation, companies must drive organization innovations to adapt and transform current structures and processes. However, the increasing relevance of discontinuous innovations demands much more from established companies. In the end, established companies should become capable of implementing both continuous and discontinuous innovation simultaneously.

The parallel implementation of two different types of innovation requires different types of management (see Junarsin, 2009; Bessant, 2008). The most convincing reason is that companies need to pursue different, sometimes conflicting ways of working, e.g., trial and error vs. accurate planning. These new ways of *managing and organizing* innovation processes within an established company will be the focus of our study. In particular, we focus on how entrepreneurial activities can be effectively used to (1) explore new knowledge, (2) develop discontinuous innovation, and (3) support the organizational transformation since these aspects seem to be a major challenge for established companies.

1.3 Relevance of corporate entrepreneurship

The difference between the two types of innovation (continuous and discontinuous) motivated me to perform further research about the management of different types of innovation and the role of entrepreneurial behavior. I believe that we live in a fascinating world, which is in the middle of a fundamental transition, and I would like to investigate how companies can use entrepreneurial approaches to create both continuous and discontinuous innovations in order to ensure their competitiveness.

Companies are implementing different types of entrepreneurial activities, *inside* and *outside* their organization, which is frequently discussed using the notion of *Corporate Entrepreneurship (CE)***.** The concept of CE is experiencing increasing interest from practitioners and researchers as it is recognized as one valid managerial tool to handle the challenges that arise with the ongoing globalization and digital transformation. Obviously, globalization and transformation pose fundamental challenges for established companies. Various studies have highlighted the relevance of CE in order to create new businesses or to support organizational transformation (see Kuratko, 2009; Guth & Ginsberg, 1990).

> **Definition 1.3** *Corporate Entrepreneurship* is defined as all formalized activities within an established company with an entrepreneurial focus, aiming to create new businesses or support the organizational transformation.

The definition reflects the understanding that (1) different processes / different organizational designs of CE exist and that (2) a variety of different outputs (either related to the creation of innovation(s) or to the renewal of the core organization) can be pursued through CE. Thus, CE can be seen as a set of managerial tools that can support companies in their transformation and create new, promising businesses.

1.4 Problem statement

With the increasing interest in Corporate Entrepreneurship, it can be observed that an increasing number of companies started to experiment with (a) new types of organizational designs, hereinafter named *CE forms*, and with (b) new fields of application for the various CE forms. Depending on the intended output(s), some CE forms seem to be better suited to achieve them than others. However, with the emergence of new CE forms in practice and the

various application areas of CE, choosing a suited CE form is a major challenge for the management of established companies (see Hill & Georgoulas, 2016; Keil et al., 2009).

> **Definition 1.4** A *CE form* describes CE activities that are bundled in a certain organizational unit. CE forms are characterized by specific design elements and can be distinguished from each other.

As shown in Figure 1.1, research on CE can be divided into (a) the venture level, which focuses on specific corporate ventures (see Definition 1.5), (b) the program-level, focusing on CE programs and their activities (see Definition 1.6), and (c) the firm-level, whereby research focuses on a company's overall activities in CE and high-level impact (Narayanan et al., 2009).

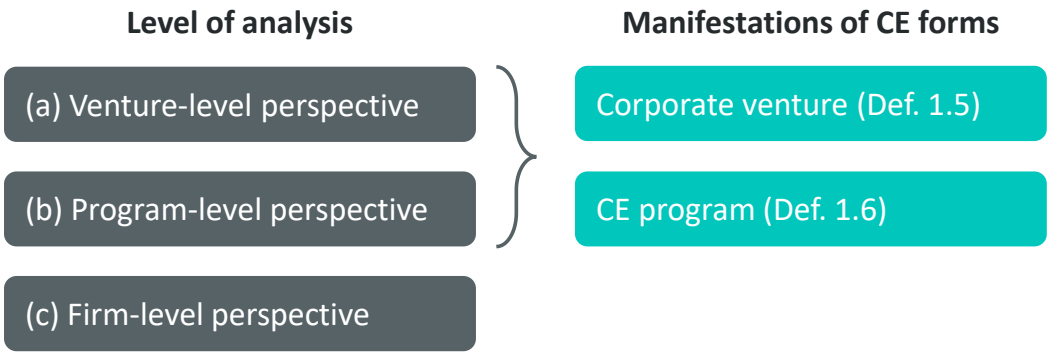

Figure 1.1: Different levels of research & manifestations of CE forms

CE forms can be observed on (a) the venture-level and (b) the program-level. On the venture level, they are defined as follows.

> **Definition 1.5** A *corporate venture* is defined as an organizational unit that an established company creates to pursue a specific innovation idea using entrepreneurial approaches.

Examples for CE forms on the venture-level are internal corporate ventures (see Makarevich, 2017), joint ventures (see Vantrappen & Deneffe, 2016), or spin-offs (see Parhankangas & Arenius, 2003). In contrast, the *organizational designs* that can be observed on a program-level do not focus on a specific innovation idea but follow rather broad objectives (Selig & Baltes, 2019). Therefore, the CE forms on the program-level, henceforth termed *CE programs,* are in the focus of this study and understood as follows.

> **Definition 1.6** A *CE program* is defined as an organizational unit initiated to either support corporate ventures or work with external startups to make use of (developing or integrating) discontinuous types of innovation.

CE programs show a high level of heterogeneity regarding their organizational designs and their value creation (see Section 4.1). Due to the emergence of novel CE program types, this heterogeneity is currently even increasing (see, e.g., Kurpjuweit & Wagner, 2020; Shankar & Shepherd, 2019)

Prior studies in the field of CE have often focused either on (1) investigating CE and its value creation from a firm-level perspective (see, e.g., Kuratko et al., 2015; Narayanan et al., 2009) or on (2) investigating a single CE form, such as corporate venture capital (Maula, 2007) or internal corporate ventures (Keil et al., 2009). However, surprisingly few studies compare the different organizational designs of CE programs and their value creation.

A literature review on the evolution of research on internal corporate venturing has highlighted the importance of deepening the understanding of (a) how the different CE programs create value for the core organization and (b) how those CE programs differ from each other (Hill & Georgoulas, 2016). The lack of understanding leads to certain problems for practitioners and researchers that are described below.

From a *managerial* perspective, the difficulty in choosing a suited CE program to achieve the intended output(s) can lead to wrong management decisions, e.g., by selecting conflicting objectives that shall be pursuit by the CE program (Hill & Birkinshaw, 2008) or by granting the wrong level of autonomy (Gard et al., 2018; Thornhill & Amit, 2001). This is additionally reinforced by the fact that in many cases, the created outputs are either unintended by the corporate management (Keil et al., 2009).

From a *scientific* perspective, the lack of understanding leads to challenges in investigating CE forms on the program-level. Even though a full understanding is not yet achieved, the heterogeneity of the value creation of CE programs is widely accepted. However, at the same time, a major part of the studies in CE focuses on traditional performance measures that do not reflect the variety of possible outputs (see Bierwerth et al., 2015). This leads to the circumstance that differences in the value creation of CE programs are not understood well. In addition, the emergence of new CE program types leads to a certain level of uncertainty regarding the organizational design of CE forms on the program-level, since it is not clear if

and how these novel CE programs are different from the well-known ones. Considering the high relevance of CE, on the one hand, and the high level of uncertainty in selecting CE programs, on the other hand, the following problem statement (PS) is formulated.

PS: How can established companies effectively use CE programs to support their organizational transformation?

To answer the PS, three research questions are defined that are described in Section 1.5.

1.5 Research questions

The first research question (RQ1) is addressing the high heterogeneity of CE programs regarding their organizational designs, which is currently even increasing since novel CE programs are emerging in practice (see, e.g., Kurpjuweit & Wagner, 2020; Peter, 2018).

RQ1: What are the different types of CE programs?

In order to answer this research question, the literature on CE and its three sub-categories (a) corporate venturing, (b) strategic entrepreneurship, and (c) corporate nurturing (see Shankar & Shepherd, 2019; Kuratko et al., 2015; Guth & Ginsberg, 1990) will be reviewed (see Section 2.1). In this section, we use forward references for proper insight and coherence. Prior studies will be analyzed regarding the different organizational designs of CE programs and design elements that are already being used in research (see Section 4.1). In addition to the design elements derived from literature, further ones will be identified by analyzing the data set (consisting of 54 cases, for more details, see Section 3.2) to uncover novel design elements and to develop an approach to define and distinguish CE programs. This approach will contribute to a better understanding of the organizational designs and their differences.

Next, the focus is set on the value creation and the respective outputs that are created by CE programs. While the different types of organizational designs of CE have been the subject of investigations for several decades (e.g., Gutmann, 2018; Burgelman, 1984), we observe that a variety of outputs and value creation have so far not experienced the same level of attention (see, e.g., Hill & Georgoulas, 2016; Bierwerth et al., 2015). However, in our opinion understanding the full range of outputs that can be created by CE programs is crucial for investigating their value creation. Hence, RQ2 of this study will address the variety of outputs that can be created by CE programs.

RQ2: What types of outputs are created by CE programs?

We will focus on analyzing the value creation of various CE programs for the respective core organization. Therefore, two types of distinctions are important. First, *the level of analysis*, which can either focus on firm-level, program-level, or venture-level (Narayanan et al., 2009) and hence provide different results. Second, the distinction between the *objectives* and the *outputs* of CE activities. While there is a broader base of empirical investigations that have focused on *why* the CE activity was initiated (objectives), there are only a few studies focusing on the concrete outputs that were achieved. In particular when it comes to CE programs.

Regarding the level of analysis, most studies that have investigated the impact of CE on the core organization are either from (1) a firm-level perspective or from the perspective of (2) a single CE form, which either is (2a) the program-level or (2b) the venture-level of CE. This results in studies that either use (a) a broad and often purely financial performance measurement, which does not reflect the heterogeneous nature of CE, or (b) the narrowly defined objectives (intended outputs), that are suited to investigate one CE form at a time, which are too specific for comparing outputs across the different organization designs (in our case CE programs).

In this study, we focus on the concrete types of outputs created by CE programs in order to deepen the understanding of their value creation. The data will be analyzed regarding (1) the spill-over effects, (2) the outputs, and (3) the changes that have been created by the various CE programs. As a result, a comprehensive list of CE outputs is composed. The outputs must fulfill the criteria of being applicable for different CE programs and identifiable in interviews.

The CE outputs from RQ2 and the CE programs from RQ1 build the basis for answering RQ3. Having understood the organizational designs and the outputs of CE programs separately, the RQ3 will focus on the relationships between them.

RQ3: Can causal relationships between CE programs and their outputs be identified?

In a later stage, we will address the relationships between the CE programs (from Chapter 5) and the harmonized set of outputs (from Chapter 6). In a first step, the CE outputs are examined with regard to their occurrences in the various CE programs when they identify which CE programs are better suited to achieve certain outputs. In a second step, we focus on

understanding how certain structural or contextual elements may have an impact on the occurrence of the various outputs.

Figure 1.2 provides a graphical overview of how the RQs described in this section are related to each other.

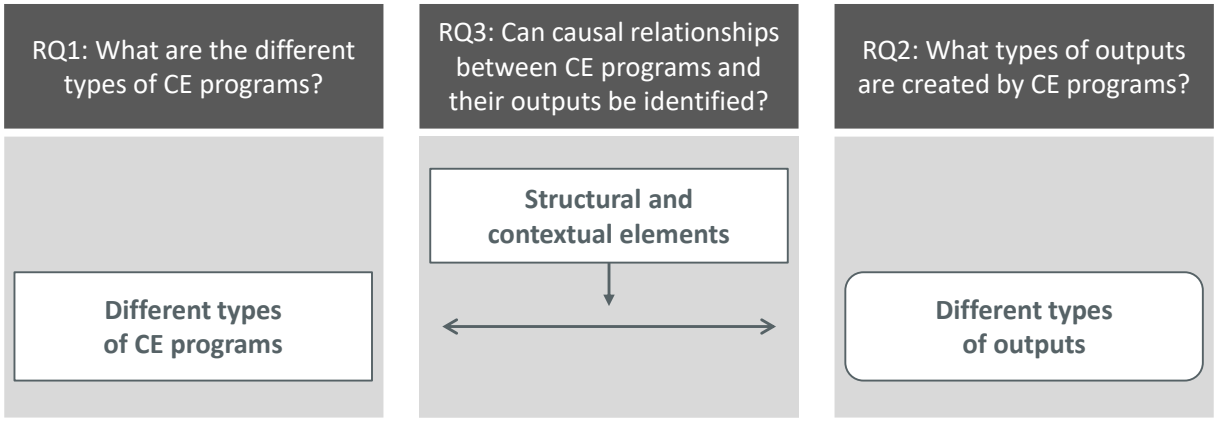

Figure 1.2: Graphical representation of research questions

RQ1 will focus on the various organizational designs that can be found in practice, which are used to foster entrepreneurial activities within established companies. Here, CE programs are covered, which are used to foster either (1) internal innovation ideas or (2) insource external innovation ideas from startups.

Due to the emergence of new CE programs and new fields of application, both are leading to increasing heterogeneity of value creation. Meanwhile, RQ2 is focusing on the different outputs created through CE programs. By providing a harmonized set of CE outputs from a program-level perspective, more comprehensive research on CE programs will be enabled.

Answering RQ3 is building on the results of the first two RQs. Here, relationships and patterns can be identified. They can ultimately serve as a basis for a more effective management of CE programs since the differences regarding their organizational designs, and their value creation will be better understood.

1.6 Research objectives

The RQs described in Section 1.5 form the basis for addressing the overall research objectives of this work. With this study, I aim to gain a deeper understanding of how to better manage CE activities by selecting the appropriate CE programs to achieve the intended outputs. With

this understanding, CE programs can be used more effectively and better aligned with a company's overall strategy. To achieve this, the following three steps will be performed.

1) *Exploring differences* of various organizational designs and offering an updated list with all current types of CE programs.
2) *Investigating outputs* from a program-level perspective and offering a harmonized set of outputs that are created by CE programs.
3) *Exploring casual relationships* between CE programs and outputs and investigating the role (influence) of certain structural or contextual elements on their occurrence.

These three steps go in line with the RQs as mentioned in Section 1.3 and form the basis of our research. Table 1.1 provides an overview of the research steps and the research method.

Research steps		Chap.	Research method	PS	RQ1	RQ2	RQ3
Introduction		1	-	X	X	X	X
Theoretical embedding		2	Literature review on CE and related work	X	X	X	X
Research method		3	-				
Systematic analysis		4	Literature review and data coding to derive design elements CE programs		X		
Step 1	Defining and distinguishing CE program types	5	Coding and morphological analysis of 54 cases to derive CE program types		X		
Step 2	Describing and harmonizing outputs	6	Creating a harmonized set of output categories and outputs (inductive coding)	X		X	
Step 3	Identify relationships between outputs and CE programs	7	Mapping CE programs and outputs to understand relationships between them				
Discussion and conclusion		8	-	X	X	X	X

Table 1.1 Structure of the research

Our data set covers in total 67 semi-structured interviews, whereby eight out of them are follow-up interviews with the same person. The interviews represent 54 cases from 36 companies. For all three research steps, the same data set was used. A detailed overview of the data set is provided in Chapter 3.

1.7 Research methodology

For conducting this explorative study, a qualitative research design was chosen. It is based on a large data set with different CE programs from established companies. The companies are headquartered in Germany, Austria, and Switzerland to reduce cultural differences that may impact the findings. Some of the companies had subsidiaries in other countries.

Based on the following three reasons, I have chosen a purely qualitative research design (see later, Subsections 1.7.1, 1.7.2, and 1.7.3).

1) Novel CE programs are emerging in practice. For example, corporate company builders (Peter, 2018), internal corporate accelerators (Selig et al., 2018), and startup supplier programs (Kurpjuweit & Wagner, 2020). However, they lack a broader base of empirical investigations and thus are neither well described nor clearly distinguished from well-known CE programs. To investigate differences in the value creation of CE programs, we need a clear understanding of their different organizational designs (see Subsection 1.7.1).
2) Regarding CE outputs, there is a higher level of unclarity than it is the case for CE programs. One reason for this high unclarity can be found in the circumstance that most studies focusing on outputs of CE did analyze this from a firm-level or venture-level perspective. The program-level perspective, however, did experience less attention when it comes to research about CE outputs. Furthermore, outputs are mostly reduced to financial performance measurement (Bierwerth et al., 2015), ignoring the variety of outputs that can be created by CE (see Subsection 1.7.2).
3) To the best of my knowledge, there is no research that is focusing on outputs of CE by comparing them across the different internal and external CE programs. Consequently, it is unclear which outputs are created by CE programs and in particular, how the various CE program types are different in their value creation. Further explorative research is required to investigate the variety of outputs and to create a harmonized set of outputs that is valid across all CE program types. Due to this lack of empirical findings, a qualitative approach was chosen (see Subsection 1.7.3).

1.7.1 Identifying and describing CE programs

The first step of this thesis focused on deepening the understanding of the various designs of CE programs. Therefore, a systematic approach to analyze CE programs was developed. This is based on an abductive approach that combines organizational design elements from existing studies and newly identified ones that were unveiled in the coding process. The analysis followed grounded theory principles (Walker & Myrick, 2006; Strauss & Corbin, 1994) to uncover new insights regarding the organizational design of CE programs

After developing the systematic approach, all 54 cases (see Subsection 3.2.2) were described and distinguished. Thereby, rather novel CE programs that still lack a broader base of empirical investigations were identified and compared to well-known ones. RQ1 will be answered by systematically describing and distinguishing the CE programs using a set of organizational design elements.

1.7.2 Exploring CE outputs and proposing a harmonized set

Answering RQ2 will be achieved by identifying and harmonizing the different outputs that are created by CE programs. In contrast to the first RQ, a purely inductive approach was selected, since so far and to the best of my knowledge, the outputs of CE from a program-level perspective have not been in the focus of prior studies.

For analyzing the 54 cases, grounded theory principles were applied, which resulted in a total number of 27 distinct outputs (see Section 6.1). These 27 outputs can be grouped into seven overall categories that are describing the areas of value creation, which can be achieved through the different CE programs.

1.7.3 Mapping CE forms with CE outputs

The last part of the empirical analysis of this study aims at investigating relationships between CE programs and CE outputs. Therefore, the results from Chapter 5 (organizational designs of CE programs) and Chapter 6 (outputs of CE programs) are used as a basis to identify relationships and patterns between both dimensions. For the outcome, read later Section 7.2 – Section 7.4.

Furthermore, this study unveiled various contextual factors that seem to have an impact on the occurrence of certain outputs in relation to CE programs. The results of this study were

analyzed from a configuration theory perspective (see Subsection 2.2.3), which provided a suitable framework to embed and understand the findings from the previous chapters.

Since this empirical study aimed at understanding the heterogeneity of CE programs, a relatively large data set was used to ensure that the full variety of organizational designs is covered. The in-depth interview, on the one hand, allows for understanding how the respective CE programs are designed, while on the other hand, due to the relatively large data set, a comparison across the different CE programs was possible.

1.8 Structure of the research

Below we provide a preview of the research performed.

Chapter 1 – Entrepreneurial activities in established companies: In the first chapter, the motivation for conducting this research is presented. Based on the motivation, I formulate the problem statement and three RQs. They are followed by the research objectives and research methodology. All four together (PS, RQ1, RQ2, and RQ3) clearly explain (1) why this specific research design was selected and (2) how this study can contribute to a deeper understanding of CE programs and their value creation including the scientific and managerial relevance.

Chapter 2 – Related work and theoretical embedding: In Chapter 2, the subject of CE will be described. Reviewing the literature about CE shows that even though the overall value of CE is widely acknowledged and understood, the concrete value creation (outputs), as well as the organizational implementation (CE programs), is not fully understood yet. Furthermore, Chapter 2 is elaborating a suited theoretical framework for conducting this research.

Chapter 3 – Describing the research method: In Chapter 3, the research method and the data set used in this study will be described. This explorative study follows a purely qualitative approach, which requires a clear and transparent description of the research process and the evaluated data in order to ensure the clarity and plausibility of the results.

Chapter 4 – Systematic approach to analyze CE programs: Chapter 4 is aiming to provide the basis for answering RQ1. Therefore, the existing literature on CE programs is reviewed (1) to describe well-known CE programs and (2) to identify design elements that are suited to describe and distinguish CE programs. The design elements derived from the literature are

complemented by additional ones derived from coding our cases. Building on this set of design elements, a systematic approach was developed to analyze CE programs.

Chapter 5 – Exploring the different types of CE programs: Chapter 5 aims to answer the RQ1 by applying the systematic approach from the previous chapter to the 54 cases from our data set. In a first step, the focus is set on defining the different CE program types, followed by the investigation of differences that clearly distinguish them.

Chapter 6 – Exploring outputs of CE programs: Chapter 6 aims at answering RQ2 by investigating the outputs of the various CE programs. In order to evaluate and compare the value creation of CE, the respective CE outputs have been investigated from the program-level. Therefore, the 67 interviews have been analyzed using an inductive approach. They identify the variety of outputs. As a result, a harmonized set of CE outputs that is valid across the various CE programs is presented.

Chapter 7 – Mapping different CE programs and CE outputs: In Chapter 7, RQ3 is answered by mapping CE outputs from RQ2 with the CE programs described in RQ1. Furthermore, relationships and patterns of certain outputs and organizational design elements and/or contextual factors are investigated. Configuration theory perspective is used to embed the finding into a theoretical framework and to better describe the results.

Chapter 8 – Answering the problem statement and concluding on this research: Chapter 8 reflects on how the PS and RQs have been answered. Based on this reflection, the theoretical contributions are highlighted. Relevant insights into the value creation and management of CE on a program-level are provided by (1) understanding the relationships between CE programs and CE outputs as well as (2) the influence of certain contextual and organizational design elements. We conclude our study by a discussion on (a) future research ideas, (b) the limitations of this work, and (c) practical implications for the management of CE programs.

1.9 Scientific relevance

The scientific relevance of this study concerns two topics that so far have received little or no attention in CE research. They are (1) a holistic understanding of the heterogeneity of organizational designs on the program-level and (2) the different types of value creation of CE programs. Furthermore, this study sets the basis for applying a promising theoretical perspective, which so far has only been hardly used in the context of CE.

The first scientific contribution is an *improved understanding of the organizational designs of CE programs*. As described earlier in this chapter, it can be observed in practice that within the past years, new CE programs have emerged. This emergence has led to a certain degree of uncertainty about the various CE programs and their differences (Hill & Georgoulas, 2016). One example is the set of startup supplier programs, which are in some studies acting as a type of external corporate accelerators (Weiblen & Chesbrough, 2015), while other studies are distinguishing them as two different CE programs (Kurpjuweit & Wagner, 2020). This example symbolizes the uncertainty regarding the organizational designs of CE programs.

For conducting comprehensive research that is investigating the various CE programs and their differences, e.g., regarding their value creation or their effective management, it is crucial to deepen the understanding of differences in the organizational designs (Hill & Georgoulas, 2016). In our study, a set of design elements is presented that is suited to define and distinguish the different CE programs. This approach contributes to a more holistic and comprehensive understanding of CE on the program-level. In addition, the set of design elements can be used to describe new types of CE programs that may arise in the future.

The second scientific contribution is *the improved understanding of CE program's value creation and the respective outputs*. The value creation shows an even higher level of uncertainty than the organization designs of CE. Even though the heterogeneity of different types of value that can be created is widely accepted (see Narayanan et al., 2009), a major part of the studies that are investigating the performance of CE did focus mostly on financial objectives (Bierwerth et al., 2015). They do not reflect the various motives and the potential outputs of CE activities (see Bierwerth et al., 2015; Keil et al., 2009). Analyzing and harmonizing the different outputs of CE programs will set a basis for deepening the understanding of the value creation of CE. Building on the results for the value creation, future studies can focus on aligning the value creation with the objectives and the performance measurement of CE programs. In this way, the investigation of the outputs contributes to a better understanding of how the various CE programs differ regarding their value creation.

The third scientific contribution of this study is made *by providing the basis for applying a configuration theory approach in the context of CE programs*. Even though the configuration theory has been widely used in organizational design and management studies, there are only a few studies using this approach in CE (e.g., Kreiser et al., 2019; Hill & Birkinshaw, 2008).

These few studies have acknowledged configuration theory (see Subsection 2.2.3) as a promising perspective to enhance the current knowledge boundaries in research on CE (see Kreiser et al., 2019).

1.10 Managerial relevance

From a managerial perspective, this study has at least two contributions that are addressing current issues in the management of CE programs.

First, there is a *broad range of different CE programs* and even more organizational design options. With the emergence of novel CE programs, the heterogeneity of organizational designs is even more increasing. By providing clearly defined CE program types and a set of design elements that are suited to define and distinguish them, the clarity in selecting a CE program for corporate management is improved. In addition, the design elements provide guidance for what design options must be considered when implementing a CE program.

Second, even though the overall value of CE activities is widely accepted, it is yet not well understood what *type of value creation can be expected*. This can be seen, for example, in the circumstance that either (1) CE programs are initiated with different, sometimes conflicting objectives or even no objective at all, and (2) a part of the value creation is not intended or unrecognized. Hence, it regularly happens that expectations are not met, and CE programs are perceived as not being successful. In general, providing a set of outputs that is reflecting the variety of values created by CE programs will form a basis for understanding (1) which objectives can realistically be achieved and (2) what objectives should be pursued with other means than CE programs.

Third, by *linking the outputs with the CE program types,* the selection of appropriate CE programs to achieve a certain objective is supported. For the corporate management, it becomes clearer (a) what types of outputs (value creation) can be expected and (b) which CE program types are better suited to create certain outputs. In addition to that, a better understanding of the outputs can also lead to more effective management, as the *measurement of the performance* can be better *aligned to the value creation* of the respective CE program.