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Article

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Review

Strategic Objectives of Corporate Venture Capital as a Tool for Open Innovation

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Abstract: Corporations are confronted with challenges adjusting to changing technologies and markets. Seeking innovations externally through open innovation is a possible approach to go beyond the internal development of innovations. One practice of open innovation to assimilate external knowledge is corporate venture capital (CVC), meaning minority investments in entrepreneurial ventures by incumbent firms, whereby the objectives of CVC investments might be purely financial or may pursue strategic goals. CVC has been identified as a possible approach to ambidexterity, since investments in new ventures can allow to explore new technologies and markets, or to improve internal exploitative capabilities. Although literature on the potential strategic benefits of CVC is abundantly available, a systematic conceptualization of strategic objectives is lacking. Therefore, this paper examines strategic objectives of CVC and seeks to enrich, extend and conceptualize existing research through a theoretical framework. The conceptual foundation of this study embeds CVC in the ambidexterity literature, and clusters objectives of CVC investments in view of an ambidextrous organization and the degree of autonomy given to CVC units. The strategic objectives that can be pursued through CVC investments are (a) strengthening the core business, (b) leveraging the ecosystem, and (c) exploring new markets and technologies. This study concludes with a comprehensive overview of the strategic objectives that can be pursued by CVC, illustrates the barriers and limitations of CVC investments, and discusses the role of autonomy and ambidexterity with respect to the individual strategic objectives. Hereby, CVC is identified as a powerful approach to engage in open innovation practices, since it allows one to pursue a range of different strategic objectives through tapping into external knowledge held by new ventures. Often considered an approach for exploring new technologies through external knowledge acquisition, CVC is also identified as an open innovation approach that allows organizations to increase their internal exploitation capabilities.

Keywords: corporate venture capital; CVC; open innovation; ambidexterity; exploration and exploitation; literature review; new technologies; innovation management; framework development; technology entrepreneurship

1. Introduction

Corporations are confronted with increasing environmental dynamics and a market situation characterized by rapid changes and growing complexity [1,2]. The literature suggests that corporations are required to enhance their innovation performance in order to stay profitable in competitive markets [3,4]. On the one hand, increased market dynamics may present competitive advantages to companies that adopt and provoke accompanying changes [5]. On the other hand, established companies are confronted with enormous challenges adjusting to globalization, changing environments and proactive transformation simultaneously [6,7]. To remain competitive, corporations cannot rely on

existing core technologies and business models exclusively [5], hence new product development is seen as fundamental to maintain competitiveness [8]. Competitiveness is determined by competitors' provision, therefore, corporations must innovate at a higher rate [1]. Thus, exploring and exploiting new technologies at a higher pace and lower cost seems like a necessary requirement. However, there are numerous internal limits and barriers in organizations for generating necessary innovations [9–11], and especially the emergence of innovation initiatives, as a fundamental requirement for innovations, is a key challenge for organizations [12].

There are limits inside organizational boundaries to share knowledge, and corporations often find it difficult to extract diverse knowledge sets required for innovation [13]. Especially disruptive, radical innovations are obligated to seek for external incubators [14]. In order to overcome these boundaries, organizations look for knowledge to exploit externally [15]. This is supported, among other things, by the targeted, effective use of different innovation methods. An approach to enhance innovation capacity is opening research and development (R&D) through collaborations and seeking knowledge and innovation externally [16]. Cooperation channels outside the parent company enable a considerably diversified approach to new products and technologies, as well as to internally unavailable resources through knowledge transfer [17]. Chesbrough [18] described this phenomenon, coining the term “open innovation”. External knowledge inflows and outflows can be (i) networks, (ii) labs and (iii) collaborations with other firms, like alliances, mergers or acquisitions [19]. The form of entrepreneurial ventures is outlined as an important source of knowledge with great economic value, as ventures produce highly innovative outcomes [20], and start-ups are recognized as the vanguard of technological change [21].

One way for organizations to access knowledge from entrepreneurial ventures in the context of open innovation is corporate venture capital (CVC) [22]. In relation to the venture capital industry, firms also might be hoping for a high return on investment, rather than absorbing their innovative capacity [23]. Yet, exploring the prospects of CVC led to the examination of the potential value creation in the form of strategic objectives, and that CVC is rather seen as a window into new technologies [23]. Research revealed that CVC can increase the investing firm's innovation rate, since newly acquired external knowledge increases the configuration possibilities of existing and new knowledge, and additionally, the exposure to new technologies and knowledge can increase the absorptive capacity of the investing firm [23]. However, innovations can vary with respect to the newness and type of innovation and thus the objectives to implement CVC may differ. The literature agrees that the alignment of the corporations' objectives with CVC units is essential for achieving financial and strategic success [24]. In order to enable a successful implementation of CVC, it is necessary to distinctly define in advance what kind of goals should to be pursued. In a seminal review on both the strategic and financial objectives of CVC investments, Chesbrough [25] has laid the conceptual foundation for further research. Some objectives of CVC complement each other and are inseparably connected, while others are antagonistic. Unconditionally, it is not only decisive which objectives can be pursued individually, but more specifically which objectives can be pursued simultaneously. In the literature, individual objectives are linked to suitable corporate structures, which makes a distinction inevitable.

Building on the elaborated CVC objectives by Chesbrough [25], this study seeks to enrich and advance the conceptual understanding of these objectives. As of today, numerous articles addressed the outcomes of CVC investments and how organizations can manage and structurally integrate CVC units, e.g., [26,27]. However, the literature is fragmented and thus, an overview and integration of concrete individual objectives into clusters that might be pursued simultaneously is still missing. This fragmentation aggravates a comprehensive identification of strategic objectives of CVC from both an organizational and a scientific perspective, which interrelationships may foster the efficiency of pursuing strategic goals, and which potential barriers hamper the performance of CVC investments. Therefore, the central question remains, which strategic objectives can be pursued through CVC investments contingent on the structural integration of the CVC units, and which objectives can

be pursued simultaneously by a given CVC unit. Therefore, individual objectives of CVC will be identified, categorized and critically reviewed in the course of this work. The goal of this study is to provide information on how CVC is best used as a tool to foster innovation inside an organization. Organizations will be encouraged to identify the type of innovation they can pursue, but it will also be necessary to examine which types of innovation cannot be pursued simultaneously by a specific CVC approach. The following research questions further guide this work: What strategic objectives can be pursued through CVC investments and which way of organizing CVC units allows to pursue these objectives?

2. Theoretical Background

In the following section, an overview of open innovation as the conceptual foundation of this paper will be provided. Subsequently, the various definitions of CVC and related concepts are presented. The need for this approach arises from the wide variety of terms used for the same or similar issues. In particular, the often contradictory or overlapping use of these terms in the literature makes a clear distinction a prerequisite for a conclusive definition and clear semantics in the rhetoric of this paper [28]. At the beginning the terminology applied will be defined to ensure scientific feasibility. There is a triad of interrelated entities: (i) the organization that operates CVC, (ii) the CVC unit and (iii) the companies in which the CVC is invested. These are referred to as “investing organization”, “CVC unit” and “portfolio company”, respectively.

2.1. Open Innovation

Open innovation is defined as a “distributed innovation process based on purposively managed knowledge flows across organizational boundaries” [29] (p. 27). Chesbrough and Bogers [29] hereby refer to the entire innovation process of an organization and not only to a specific phase as initially described by Chesbrough [18]. Organizations can pursue investments in external knowledge, seeking methods to achieve competitive advantage by exploring and exploiting new technologies, business models and markets. These concepts of open innovation are to be seen within the context of an initial opening of R&D departments [30]. Open innovation abandons the traditional idea of initiating an innovation process by internal R&D exclusively and describes it as a multi-layered, open search and solution process that takes place between an organization and external participants [31]. Thereby, open innovation offers a broad range of alternative sources of innovation beyond the traditional closed innovation within the boundaries of an organization [32].

However, sourcing external knowledge to initiate internal innovation processes can lead to organizational conflicts. Organizations must create ways that allow external knowledge to flow into the internal knowledge and innovation funnel [33]. A well-known and central problem that organizations must thereby consider is the not-invented-here syndrome, referring to employees rejecting externally sourced ideas and technologies [34]. While the not-invented-here syndrome primarily emerges on the individual level of employees, there are contextual factors such as the organizational culture, the absorptive capacity or the incentive system that shape and influence the employees’ perceptions on external ideas and technologies [34]. Therefore, organizations can actively create countermeasures to reduce these internal barriers to open innovation. In particular, employees who might reject external sources of innovation must be explicitly considered. Promoting an organizational culture that encourages these employees to be more open, convincing them of the positive value of external knowledge, integrating them into the innovation process and creating cohesiveness are possibilities contributing to overcome the not-invented-here syndrome [35]. In this context, Yun et al. [36] emphasize the central role of the organizational culture for open innovation, and highlight that an entrepreneurial orientation is a requirement to successfully engage in open innovation practices.

Organizations that can successfully address and manage the aforementioned challenges, however, can benefit from open innovation [37]. Firms that primarily seek innovations internally through a local search for solutions risk that they fall behind the technological development of the market [38].

This local search bias leads to solutions that are close to the organization's existing knowledge and thus can limit the overall innovation potential [39]. Open innovation allows to gain access to the knowledge held by external parties, such as other companies, suppliers, or customers. This in turn enables organizations to tap into distant knowledge, eventually resulting in more innovative solutions and increased innovation performance [39].

Open innovation itself occurs in a variety of forms. This process of developing new technologies or using existing ones in collaborations with external partners is split in three knowledge transfer processes: (i) Outside-In, the absorption and integration of external knowledge, (ii) Inside-Out, externalization and representation of internal knowledge and (iii) Coupled, a mixture of Inside-Out and Outside-In [29].

With CVC being the fundamental method of this study, it is necessary to understand the underlying conceptual structures of open innovation to examine the way how CVC fosters innovation. In a broader context, open innovation can be seen from a micro- and a macro-perspective. The macro-dynamics describe the cyclical dynamics of open innovation, whereby social entrepreneurs initiate new combinations between technologies and the society, which subsequently constitutes the source for market open innovation, connecting new these new combinations with the market [32,40]. As a result, established firms integrate this newly created knowledge through diverse open innovation channels [32]. This cyclical nature of the open innovation macro-dynamics contributes to the growth of the economy [32]. The micro-dynamics of open innovation refer to the quadruple helix of open innovation, which constitutes different stakeholders in the open innovation ecosystem, comprising the industry, universities, governments and society [32]. Organizations that engage in CVC investments are embedded in this dynamic perspective, in particular within the industry dimension of the quadruple helix model. By integrating external knowledge from new ventures inside a corporation (Outside-In) and supporting spin-off ventures after separating from a corporation (Coupled), open innovation is the key foundation that incentivizes the need for this approach. Being proposed as an important strategic tool to explore and exploit technologies and foster innovation [41], CVC is widely discussed in the literature [42]. Given the increases in globalization, CVC investments can serve to acquire external knowledge from ventures even distant from the geographical location of investing organizations [43], and thus represents a powerful tool in the context of open innovation. Based on the theoretical groundwork of open innovation, CVC is now characterized as a method to stimulate innovations.

2.2. Corporate Venture Capital

CVC is defined as an equity investment in independent entrepreneurial ventures by incumbent firms [23]. As a form of financing, CVC cannot be discussed separately from the traditional concept of Venture Capital. Rather, these two forms of financing build upon each other. Kortum and Lerner [20] define the concept of Venture Capital by three essential characteristics. Firstly, Venture Capital firms provide investment-like capital for young, high-growth companies. Secondly, the investment does not only consist of the provision of financial resources but is inextricably linked to the provision of management support. Lastly, the long-term perspective of Venture Capital companies is mentioned. CVC units follow these concepts of independent Venture Capital. Both make staged investments in entrepreneurial start-ups, allowing them to absorb information, review their progress and preserve flexibility to vary commitment until technology and the market are explored [44]. On the contrary, an independent Venture Capital firm focuses on the return of investment and is not induced to make financially controversial investments. This focus is where the two concepts of corporate financing differ. Chesbrough and Tucci [45] even exclude investments that are made for purely financial reasons in their conceptual understanding of CVC.

In addition, the definition of CVC excludes investments through external fund managers, even if the investments are intended to pursue the interests of the corporation [25]. CVC is thereby clearly differentiated from Venture Capital. By definition, spin-offs are included, meaning investments into technologies and enterprises that were not suitable or profitable for the core business of a corporation,

leading the firm to halt funding them within the corporation [25]. To keep them in sight for future collaborations and acquisitions with the corporation, they are further developed outside the corporation in order to minimize risk and accelerate entrepreneurial growth potential. Finally, the definition is extended to ventures receiving the investment being separate legal entities [45].

The research focus on CVC increased among researchers [42]. Especially, its cyclical occurrence in corporations, a peculiarity of CVC, opened a controversy [46]. In order to understand the innovation driven implementation of CVC units, the cyclical and volatile history of CVC units needs to be investigated. CVC first arose in the 1960s and was characterized by periods of rapid growth accompanied by periods of precipitous declines [47]. This has led to skepticism towards CVC in the literature by traditional Venture Capital firms and the portfolio companies receiving funding [48]. Birkinshaw and Hill [49] describe the reasons for the cyclical and volatile nature of CVC activity as short-term thinking, which is impaired by economic oscillations. This led to a disadvantage for promising start-ups. In order to counteract these cycles, CVC's focus has changed [46]. Financial goals are identified to have led to market-driven, short-term decisions. Potentially misguided decisions are no longer in the foreground [50]. Corporations have learned that CVC provides more than financial success measured by return on investment. The additional value creation is considered as the underlying reason for implementing CVC and is investigated further. Yet, the difficulties of measuring CVC's versatile strategic objectives have only been elaborated fragmentarily. The precise definition of these strategic objectives is considered a prerequisite for the successful exploitation of CVC's potential to foster innovation [24]. Nevertheless, innovation is not only about exploring new things, but also improving the existing core business and creating new processes with innovations that enable corporations to remain competitive [1]. This consideration leads to CVC being closely related to the concept of ambidexterity [51], defined as the ability of organization to perform both explorative and exploitative capabilities [52].

2.3. Ambidexterity of CVC

The concept of organizational ambidexterity gained popularity since the early 2000s (e.g., [53–55]), and has been found to positively impact firm performance [54]. Ambidexterity is defined as the ability of an organization to perform both exploration and exploitation, referring to the abilities to compete in new technologies and markets and to compete in mature technologies and markets, respectively [56]. Organizations can encourage ambidexterity in a myriad of ways. Research has shown that, for instance, the employed leadership style can foster ambidextrous structures [57,58], establishing explicit organizational structures can support ambidexterity [59], or HR practices including the development of skills and competencies might be beneficial for ambidexterity [60].

Research suggests three ways to establish ambidextrous structures: structural, contextual and sequential ambidexterity [56]. Structural ambidexterity refers to structurally separated business units that either perform exploration or exploitation, contextual ambidexterity refers to a single business unit that performs both exploration and exploitation, whereby single individuals within the business unit pursue either of the tasks, and sequential ambidexterity refers to shifting the focus between exploration and exploitation based on changes in the environment [56,61]. Although these types of ambidextrous structures provide guidance, organizations often find it difficult to implement organizational structures that support ambidexterity, in particular concerning explorative activities [62]. In this context, practices of open innovation have been identified to contribute to ambidextrous activities, and in particular explorative activities can be encouraged by implementing Open innovation [63]. Hereby, CVC units can constitute a solution to implement explorative activities, whereby the need to restructure the organization itself is rather limited. CVC units may thus be a feasible approach for organizations to foster ambidexterity.

Hill and Birkinshaw [26] offer a typology of the CVC strategy to be pursued, exploration or exploitation, and the locus of opportunity, internal or external, thereby explicitly linking CVC to the concepts of ambidexterity and open innovation. In this context, Rothaermel and Alexandre [64]

find that organizations that balance internal and external sourcing of new technologies, understood as a form of ambidexterity, demonstrate increased innovativeness and financial performance. CVC, as a form of external sourcing, thus constitutes a valuable approach to increase an organization's competitive position.

Hereby, CVC units do not only engage in explorative activities by investing in new ventures. Hill and Birkinshaw [65] state that in particular CVC units that are able to perform both explorative and exploitative activities, i.e., which are ambidextrous, exhibit improved strategic performance. This notion, however, counteracts the idea of CVC's being primarily related to structural ambidexterity [51], but suggest that CVC units may best perform under contextual ambidexterity, whereby the CVC unit performs both exploration and exploitation. Connecting to the focus of this study, Rossi et al. [41] highlight that in particular, strategic goals of CVC conceptually link to ambidexterity. Although CVC offers great opportunities to build an ambidextrous organization, Rossi et al. [41] further emphasize that although the seminal article by Hill and Birkinshaw [51] on CVC and ambidexterity found great attention, there is still a need for further research on the ambidexterity of CVC. With this study, we seek to contribute to improving the understanding of how CVC investments and ambidexterity are linked, and which strategic goals can be pursued in consideration of an ambidextrous organization, laying the conceptual groundwork for future research.

2.4. Framework Development

Building on the CVC and ambidexterity literature, it is decisive to identify the different types of strategic goals of CVC and to form clusters in a comprehensive way. Due to the versatility of different objectives of CVC, a clear understanding of its strategic aspects must be established that allows for a targeted implementation of CVC, where mutually exclusive goals are distinguished. This is necessary for corporations to identify the emerging potentials and to enable an optimal alignment and implementation of CVC units. With the help of CVC, an established corporation gains access to the knowledge of new ventures and can thus increase its own innovation activity [66]. Being not too risk-laden and reversable, but enabling personal close integration, CVC is a major organizational vehicle to engage in open innovation [18]. However, in order to understand CVC's potential benefits and importance to corporations, the value creation of CVC must be analyzed beyond its financial purposes.

In the literature, the financial aspect is subordinated to the strategic aspect [47]. As discussed, the financial objective is made accountable for the cycling occurrence of CVC. Thus, the literature agrees on strategic objectives as the sustainable driver of CVC [67]. Furthermore, the question of how a CVC unit should be designed in order to be successful has already been discussed in the literature in recent years [49,66,68,69] and no conclusive, unambiguous recommendation for application has yet emerged, not least in view of the different strategic objectives. To this point, it has become clear that different objectives of CVC programs entail different structures and processes [25,49,67].

Considering the literature on the strategic benefits of CVC is fragmented due to a focus on individual objectives, a comprehensive and systematic collection of individual strategic objectives and an integration into an overarching framework has yet to be established. Combining the knowledge of strategic objectives as main drivers for CVCs' success and a corporations' strategy depending on its objectives, a framework needs to be set in place in order to map strategic objectives that stimulate, foster and generate the innovation outcome of a corporations' CVC unit [67]. From a scientific perspective, a framework that clusters and integrates the existing scattered research on CVC allows to create a uniform understanding of the accompanying strategic benefits. Furthermore, a framework supports the growing stream of CVC research by providing a common basis for future research and the identification of interrelations between different strategic objectives, that have not yet been established due to a lack of a comprehensive perspective on strategic aspects of CVC.

Previous research provides an initial categorization of different objectives based on their similarity [67,68], and a seminal approach of differentiating and mapping objectives is provided by Chesbrough [25]. The framework of Chesbrough [25] differentiates CVC investments on the basis

of two dimensions. The first distinction is made between the different objectives that investments may have for corporations—financial or strategic. The second one distinguishes the degree of linkage from the invested company to the current operational capabilities. Thus, investments are allocated to one of four created classifications.

Chesbrough [25] classifies *driving investments*, which advance the strategy of the current business, and *enabling investments*, which complement the strategy of the current business, within the strategic objectives of CVC. A third type—beyond purely financial investments—are *emergent investments*, as Chesbrough [25] calls them, which aim at exploration of potential new businesses. Emergent investments have been classified as having a financial objective in Chesbrough's [25] framework, however, he mainly discusses strategic aspects of emergent investments, pointing out that strategic goals may play a crucial role for this type of CVC investments as well. We build on the original classification of Chesbrough [25], but consider emergent investments from a purely strategic perspective. For the purpose of avoiding confusion about the terminology, we adopt a different description of the three major strategic objectives of CVC: *Strengthening objectives*, aiming at strengthening the core business of an organization; *complementing objectives*, aiming at enhancing the ecosystem and exploiting complementary assets; and *expanding objectives*, aiming at identifying new technologies and business opportunities. The main goal of this review is to identify a comprehensive list of strategic objectives that can be attributed to the three categories of objectives.

The classification of the objectives can further be related to the linkage between the investing firm and the portfolio company [25]. Chesbrough [25] hereby refers to the degree to which the venture companies are linked to the operational capabilities of the investing company, such as resources and processes. Chesbrough [25] suggests that the objectives invigorating the core business require a tight linkage, whereas objectives concerning investing in complementary assets require a loose linkage. Further, he [25] argues that exploration of new technologies and markets for pursuing financial objectives requires a tight link of the portfolio companies and the investing organization. In contrast, Asel et al. [70] state, in terms of autonomy rather than linkage, that CVC units organized externally—and thus ones which are highly autonomous—are better suited to pursue these exploration activities. Complementing this view of autonomy, Yang et al. [71] find that CVC units with high autonomy can lead to increased CVC portfolio diversification and further, can increase the investing organization's growth opportunities and innovativeness [72]. Building on the findings of Yang et al. [71], Lee et al. [73] explicitly link exploration and exploitation activities to CVC autonomy, and find that the structural autonomy of CVC units positively impacts the investing organization's explorative innovation performance. Hence, we consequently argue that *expanding objectives*, viewed from a strategic perspective, require high autonomy between the investing organization and the CVC unit. Importantly, we want to highlight that we deviate from Chesbrough's [25] framework in that we do not consider the direct linkage between the investing organization and the portfolio companies, but we consider the degree of autonomy between the investing organization and the CVC unit responsible for executing the CVC investments. Figure 1 illustrates the structural configuration of the investing organization, the CVC unit and the portfolio company in view of the given autonomy.

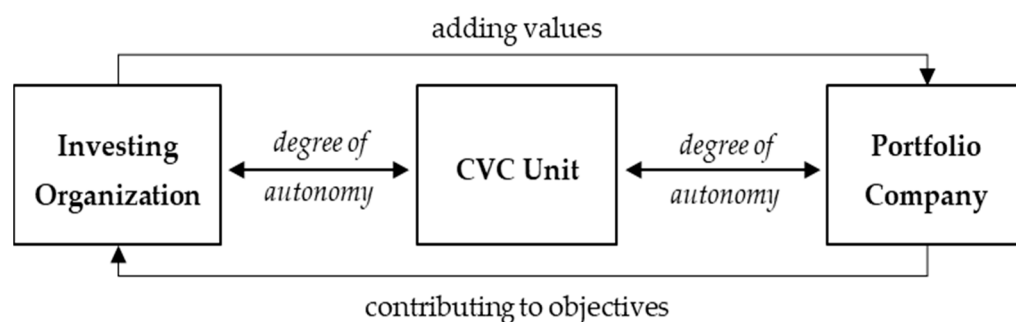


Figure 1. Corporate Venture Capital (CVC) Structure.

Summarizing the relationship between the three categories of strategic objectives, *strengthening*, *complementing*, and *expanding objectives*, and the degree of autonomy, *strengthening* and *expanding objectives* clearly relate to opposite ends of a continuum. *Complementing objectives* are positioned in between, as these objectives comprise investments in the ecosystem, that may not be directly related to the core business and might be distant from the investing organization's knowledge. However, the strategic objective pursued by this strategy is to complement the core business. Thus, we argue that the autonomy given to the CVC unit cannot be as high as for the case of exploring completely new markets and technologies, but given the consideration that these investments are not directly linked to the core business, the autonomy may not be as strict as for *strengthening objectives*. Thus, we conceptually position the autonomy of CVC units pursuing *complementing objectives* between the boundaries of *strengthening* and *expanding objectives*.

Figure 2 provides the conceptual framework developed through synthesizing the reviewed literature on strategic objectives of CVC, ambidexterity-orientation and the level of autonomy between the investing organization and the CVC unit. This framework will guide the following sections, as we seek to enrich the three categories of strategic objectives with concrete strategic goals that can be pursued by the investing organization.

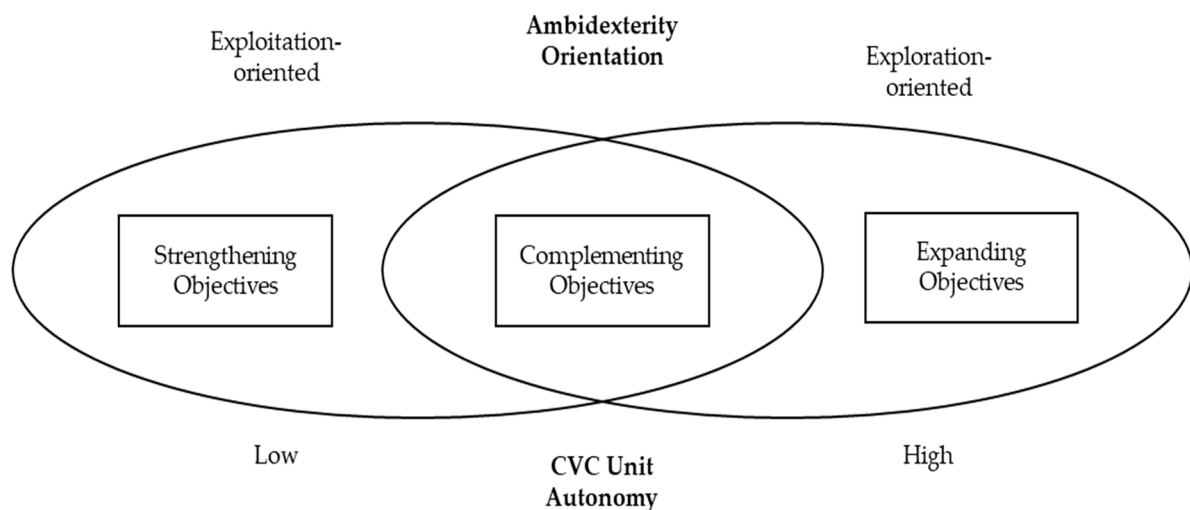


Figure 2. Framework on Strategic Objectives of Corporate Venture Capital, Ambidexterity Orientation and Autonomy of the CVC Unit.

3. Methodology

This review intends to comprehensively examine and review strategic objectives of CVC for innovation purposes. Accordingly, the framework will be used to structure the literature in a way that all innovation-related findings of CVC investments can be assembled and compared. The methodology of an integrative literature review will be used to conduct this research [74]. The aim of this approach is to synthesize different research streams in order to generate a theoretical framework. It is best conducted in differently conceived topics that have been studied by various researchers in different scientific fields [75]. Differentiated research streams resulting from CVC studies include topics across innovation, entrepreneurship, finance, strategy and governance [23,44].

Following previously published literature reviews [76,77], Web of Science (WoS, formerly ISI Web of Knowledge) is used as a database. Only peer-reviewed literature is considered to maintain a minimum quality level. To gather all CVC related literature, the search string “Corporate Venture Capital” was searched for in “Topic”, which includes the search results title, abstract and keywords. This search returned 134 results. Due to different research streams of CVC, only selected literature was analyzed. To balance feasibility and comprehensiveness for the semi-systematic literature review, first, abstracts were read, and the relevant literature was identified. Several aspects led to

exclusion: including a focus on the start-up prospection, governmental analysis, a focus on only financial investigations, differentiation of different cooperation methods, non-scientific studies and not peer-reviewed publications. After exclusion, 39 relevant scientific works were identified. These studies were chosen for the examination of the innovation capabilities of CVC and different kinds of objectives. The articles included in this review were then classified according to the three different types of objectives of CVC: *strengthening objectives*, *complementing objectives*, or *expanding objectives*. Multiple entries of single articles into more than one objective category were accepted, because many articles do not differ explicitly between the targeted objective of CVC investments. Further, the classified literature was compared and examined for identical, complementary or contradictory arguments.

4. Results

Synthesizing the information from the examined articles, the findings can be parsed. The three types of objectives, each of which may create different types of innovation as an output, are divided into *strengthening*, *complementing* and *expanding objectives*. Table 1 provides an overview of the findings for each of the three categories of CVC objectives, and lists specific individual goals that may be pursued within these objectives, as well as potential limitations and barriers.

Table 1. Strategic Objectives of Corporate Venture Capital.

Purpose		Construct	References
Strengthening	Invigorate ongoing strategy by strengthening the core business	Opportunities	Protect the core business [17,25,70,78,79]
			Improve own technology, R&D efficiency or capacity [17,21,25,45,69,79–86]
	Limitations and Barriers		Status quo is less risky than investing in external R&D [44]
			Resource conflicts between internal R&D and external new ventures [17,69]
			Promising new ventures and start-ups operating in the same industry are less likely to seek CVC backing [68,83,87,88]
Complementing	Leverage business by enhancing the ecosystem and exploit complementary assets	Opportunities	Strengthen, improve and extend supply and value chain [25,69,70,78,79,81,83]
			Develop technology standard through the ecosystem through complementarity [25,68–70,79,81,89]
			Complementary knowledge/experience spillovers through external knowledge acquisition [42,79]
			Create market entry barriers [70]
			Facilitate spin-offs [69,90]

Table 1. Cont.

Purpose		Construct	References
Expanding	Limitations and Barriers	Staff of CVC unit lack experience or knowledge diversity in other fields than the core business	[91–93]
		Expose and identify novel and innovative technologies and markets	[21,25,45,49,69,78–80,84,93–97]
	Opportunities	Acquire technical and market knowledge in areas distant from the core business	[25,42,67,70,79,83,85,98,99]
		Support acquisition intentions as real options approach	[31,79,80,84,95,99–103]
	Limitations and Barriers	High internal innovation performance limits the need to explore external sources of new technologies	[44]
		Economic slowdown can lead to a more defensive strategy to protect the core business	[69,70]
		Natural limits of absorptive capacity	[23,79,84,92,96,98,99]
		Staff of CVC unit lack experience or knowledge diversity in other fields than the core business	[69,91–93]
		Restrictions through strategic boundaries	[23,69,70,86,96]

4.1. Strengthening Objectives

The first category, *strengthening objectives*, includes investments made to promote the ongoing strategy and further strengthen the investing organization's core business. These investments encourage the use of current technologies, skills and resources to enhance, test or expand core businesses or find new innovations that maintain current standards. This ensures that the existing strategy is further invigorated and that any new insights are aligned with the company's vision and expected development [25]. CVC investments may therefore pursue to identify ways how the core business can be further exploited [17].

Moreover, CVC investments can also serve to identify new and disruptive technologies and products that can potentially constitute a threat to the core business of the investing organization [70,83]. Hereby, the objective is closely related to *expanding objectives*, which may also serve to identify novel and innovative technologies. However, the goal when pursuing *strengthening objectives* differs by not explicitly aiming to adopt new technologies, but to identify threats such that the investing organization is informed about potential dangers such as substitutes and can take appropriate measures to protect the core business. In this context, Keil et al. [21] mention that investing organizations can thereby identify shortcomings of their own capabilities that are necessary to compete in the future.

Beyond protecting the core business, organizations investing in new ventures may also improve their own technology or increase the internal R&D efficiency. As such, investing organizations can agree on licensing deals with the new ventures they invested in, such that technologies or products created by new ventures can be integrated into the core business and enhance it [79,85]. In particular, CVC investments open up possibilities that may not be detected by the internal R&D department, such that the portfolio companies complement internal R&D efforts [45,84,86]. This can ultimately lead to an increase in internal R&D efficiency when research tasks are outsourced to the portfolio companies [69], especially when the portfolio companies themselves are more efficient [80]. Pursuing CVC investments aiming to fulfill these *strengthening objectives* can therefore increase the investing organization's own innovation performance [82].

Strengthening objectives are, however, limited through a variety of reasons. One of the main criticisms of this type of investment is its limited growth potential. This drawback stems from the findings of previous research: On the one hand, if the innovation performance of the investing organization is already on a high level, there might be only limited benefits from external sources of knowledge for the organization when investing in new ventures through CVC, such that CVC investments are perceived as riskier than the status quo [44], which may lead to resistance towards these investments. On the other hand, in particular highly innovative new ventures are less likely to seek CVC backing [87]. Start-ups may perceive that organizations that operate in the same industry could misappropriate their technologies due to expected opportunistic behavior when they engage in CVC investments [68,88]. This leaves investing organizations with less innovative start-ups, that, according to Dushnitsky and Shaver [87], have only little to lose from a CVC investment. Therefore, organizations pursuing *strengthening objectives* face the challenge to identify innovative new ventures that are willing to engage in a CVC relationship. Since this willingness to cooperate is reduced due to the mentioned fear of misappropriation, imitation or substitution, the growth potential can be limited when only partnerships with less innovative start-ups are possible.

Beyond, close synergies between the corporation and the invested firm in similar markets and technologies can further lead to a competitive mindset [86]. CVC investments that relate to the core business may thus lead to conflicts. When the investing organization and a portfolio firm own substituting technologies, start-ups with superior technologies may render internal R&D obsolete [69]. Thereupon, conflicts may arise that limit the knowledge flow between the investing organization and the new venture [69], counteracting the very goal of CVC investments pursuing *strengthening objectives*.

4.2. Complementing Objectives

The innovation potential emerging from *complementing objectives* can be summarized as a complementary effect, which stimulates demand for the existing products and technologies of the investing organization [25,79]. These investments intend to enhance processes, capabilities and attitudes around the core business. *Complementing objectives* include any investment that aims to create and improve the ecosystem around the core business. Investing in technologies that benefit suppliers, customers or developers, without improving the actual core business, can create growth opportunities, even if the corporation is not able to transfer technology from the start-up or acquire its innovations [69]. Investing in start-ups that operate in complementary markets provides great potential for organizational learning, since a cooperation yields the opportunity of knowledge and skill spillovers into the investing organization [42,79]. Thereby, internal explorative activities can be improved due to the increased knowledge base [79].

Furthermore, CVC investments can allow to create a robust ecosystem around the core business, which contributes to the development of a technology standard or create market entry barriers [70]. For instance, technology standards can be encouraged by investing in new ventures that are able to integrate technologies of the investing organization in their own products [25]. This can lead to synergistic effects between the investing organization and portfolio firms [81], and the new ventures contribute to strengthen the competitive position of the technologies of the investing organization and

may transfer these technologies to new fields of application [25]. This may also inform organizations about potential extensions of their existing business for the future [83].

Building social capital is seen as a further strategic goal. A challenge for organizations can be that particularly innovative and entrepreneurial employees leave a company if they believe that they are unable to develop to their full potential [90]. CVC can serve to improve the entrepreneurial culture within the organization in order to attract and retain talent [69]. Skills learned from CVC for management improves the operation of internal projects and gives employees who are willing to start a business a chance to maintain their loyalty to the corporation [69]. By retaining and encouraging employees within an entrepreneurial environment, innovations are fostered and incentives for potential spin-offs are made [69]. If an idea cannot be further developed in the corporation, CVC units offer a supporting function for external venture development. Spun-out ventures provide the possibility to create social capital links with the investing organization, such that market uncertainty can be reduced and knowledge flows between the investing organization and a spun-off venture can be created [90].

Considering the challenges for CVC investments pursuing *complementary objectives*, little research is available about potential limitations and barriers. One identified barrier addresses the experience of the CVC unit responsible for managing the investments in new ventures. Since *complementary objectives* may pursue opportunities not directly linked to the core competencies of a company, the CVC unit staff may lack experience or knowledge diversity in other fields than the core business [91–93]. Knowledge flows from CVC investments are increased if investing organizations exhibit high knowledge diversity [92]. Thus, insufficient knowledge diversity can limit the potential learning effects that can emerge from investing in the ecosystem around the core business. Moreover, since portfolio companies are not structurally integrated in the investing organization, a lack of contact between internal R&D and the new ventures can limit the technological learning effect [93], such that experience spillovers are limited if knowledge flows are not managed explicitly by the CVC unit.

4.3. Expanding Objectives

The last type of CVC investments pursues *expanding objectives*. These investments are directed to identify new technologies and markets relevant for the investing organization and can allow to acquire knowledge in areas distant from the core business. These investments often have no contribution to the current business operations of the investing organizations [79], but can serve as a tool to identify new technologies and markets before competitors [49,78,84], providing an option to maintain competitive advantage in the future. Thereby, CVC investments can complement internal R&D efforts to spot future technologies and increase the general exploration capabilities of organizations [45,69], serving as a mechanism to overcome organizational inertia [21]. The objective of identifying new technologies and markets is not necessarily equal to the acquisition of knowledge, but can also only provide insights for the management of an investing organization on potential technologies that may become important in the future [97]. Since CVC investments are typically among the least expensive forms of external corporate venturing, the risk involved in these investments is limited such that CVC is a relatively cheap form of technology exploration [93].

Beyond informing an organization about new technologies and markets, CVC investments pursuing *expanding objectives* can—in a second step—also lead to the acquisition of knowledge on these technologies and markets, and be used as inputs for new product development [85]. CVC investments in start-ups creating new technologies can increase the technological diversification of the investing organization [98]. In particular if CVC is employed with additional types of external venturing, such as equity alliances or mergers and acquisitions, the innovation performance of organizations can be increased [42], indicating that organizations acquire important knowledge from these operations. In fact, Weber and Weber [67] found that CVC investments can benefit radical innovation purposes, which requires a clear knowledge transfer process between the CVC unit and the portfolio companies.

Lastly, CVC investments in new ventures can also be viewed from a real options perspective. In accordance with real options reasoning [31], if uncertainty is high, firms prefer to make small initial

investments, while learning about the investment feasibility and delaying large investments until sufficient certainty about the invested venture is obtained [42]. This allows investments to be monitored and evaluated before making more restrictive commitments [101]. Real options are particularly of value for an investing organization if the industry is subject to fast technological change [95]. CVC investments allow organizations to enter licensing agreements to use new technologies [101], or to shift potential acquisition intentions to the future when the uncertainty on the new technology decreases [102].

However, CVC investments aiming to explore new technologies and markets suffer from several limitations and barriers. Firstly, if an organization already exhibits high levels of internal innovation performance, the need to invest in external sources to boost innovation can be perceived as rather low [44]. This consideration is further reinforced in times of economic slowdown, when organizations primarily focus on maintaining core business operations, further decreasing the need to invest in new ventures to pursue new technologies [69,70].

Furthermore, one of the central barriers to *expanding objectives* is the absorptive capacity of an investing organization. Many studies find a U-shaped relationship between CVC investments and positive learning effects [79,92,96]. Increasing CVC investments leads to increased complexity [96], and especially the lack of knowledge in technologically distant areas may limit the absorptive capacity of organizations when investing in new ventures unrelated to the core business [99]. This drawback relates to the knowledge and experience of the CVC unit staff which was already outlined for *complementing objectives*, but can also be a central determinant hindering to pursue *expanding objectives* in consideration of absorptive capacity restrictions.

Lastly, the potential of CVC units can be limited through strategic boundaries imposed by the investing organization. Asel et al. [70] report interviews indicating that organizations may simply pursue financial objectives through CVC investments, and these investments must be clearly tied to the core business, which clearly counteract the idea of *expanding objectives*. A second impediment to pursue *expanding objectives* is potential knowledge redundancy if several instruments (such as technology alliances and CVC simultaneously) are used in the same industry aimed at external knowledge sourcing, which can render the potential knowledge exploration obsolete [96]. Finally, the intellectual property (IP) regime in which the investing organization operates may play a central role for the usefulness of CVC investments considering strategic objectives. Dushnitsky and Lenox [23] point out that their findings only indicate positive effects of CVC investments on innovation performance if investments are made in weak IP regimes, and strong IP regimes may provide less strategic benefits to the investing organization.

5. Discussion

CVC is a mechanism that organizations can use to gain access to the knowledge of new ventures, enabling organizational learning and contributing to maintaining a competitive advantage. CVC investments can be classified as a form of open innovation, as external knowledge flows may trigger internal innovation initiatives in the investing organizations. However, CVC has long been viewed as a tool to primarily gain financial benefits in terms of high returns on investments from the start-ups. Neglecting the potential strategic gains that CVC investments can offer implies that a great opportunity to improve innovation performance is lost. The goal of this study was to identify and categorize strategic objectives that can be pursued through CVC investments, where limitations and barriers can emerge, and suggest a framework based on an ambidextrous view of how organizations should structure CVC units according to the pursued objectives.

We suggest three overarching strategic goals that can be pursued through CVC: (i) *strengthening objectives*, which require low levels of CVC unit autonomy to support the ongoing strategy of the investing organization, such that primarily exploitative activities are strengthened; (ii) *complementing objectives*, which leverage the ecosystem around the core business of the investing organization, and can stimulate both exploitation and exploration; and (iii) *expanding objectives*, which require high levels of CVC unit autonomy with the aim to

identify new technologies and markets (exploration) and potentially integrate them in the portfolio of the investing organization.

5.1. Theoretical Implications

The suggested framework enhances the seminal article by Chesbrough [25] by focusing on the strategic perspective of CVC and enriches the framework with concrete goals based on the findings of recent research. The three categories of strategic objectives are further attributed to the ambidexterity-orientation of the investing organization, complementing the view of CVC as a form to build ambidextrous organizational structures [41,51]. Hereby, CVC units that perform ambidextrous activities themselves have been found to outperform CVC units that focus on single objectives [51]. Relating to our findings, CVC units that are able to pursue both *strengthening* and *expanding objectives* simultaneously are more likely to survive in the long-term and provide benefits to the investing organization [51]. CVC units are traditionally viewed as an approach to structural ambidexterity [51], due to the structural separation from the investing organization [56]. Given the findings that CVC units performing both exploration and exploitation are potentially more beneficial for the investing organization, we argue that CVC units themselves should also be considered a form of contextual ambidexterity. Contextual ambidexterity requires that individuals within CVC units pursue the different goals of exploitation and exploration [56], or *strengthening* and *expanding objectives*, respectively. In this regard, further research is required to determine the implementation options of CVC units aiming to pursue both strategic objectives. In particular, our framework suggests that *strengthening objectives* require a rather low CVC unit autonomy, whereas *expanding objectives* require a high CVC unit autonomy. Future research may investigate whether it is feasible for organizations to provide varying levels of autonomy to individuals within one CVC unit, and whether this approach leads to increased CVC performance compared to structurally implemented CVC units.

For *complementing objectives*, existing research provides relatively little evidence on this approach to CVC investments, as it falls between the continuum of exploration and exploitation and is thus more complex to operationalize. CVC units pursuing these objectives may perform both explorative and exploitative activities, contingent on the available new ventures. We conceptually link *complementing objectives* to another form of ambidexterity—sequential ambidexterity. Sequential ambidexterity is characterized by a shifting perspective and continuous balance between exploration and exploitation [56,104]. As Zimmermann et al. [104] note, their findings suggest that these shifts can emerge from bottom-up initiatives. As such, the CVC unit staff may determine the current focus of its operations, and flexibly shift the focus on exploration or exploitation when required. However, this requires that the given autonomy to the CVC unit must be adapted accordingly, which we perceive as rather complex to implement in practice. However, we see this form of CVC unit strategy as an interesting field for future research. In an open innovation context, it has been found that in particular knowledge sourcing from suppliers constitutes a highly relevant knowledge source to foster innovation ambidexterity [105], which is attributed to *complementing objectives* in our framework. We therefore encourage future research to investigate the applicability—and eventually performance—of CVC units that pursue a sequential approach to ambidexterity with focus on *complementary objectives*.

5.2. Managerial Implications

Although this review study aims to develop a framework based on the existing literature, we believe the results allow one to derive valuable managerial implications from the preceding theoretical considerations. Ernst et al. [69] argue that there are two reasons for the failure of CVC units: Firstly, a missing synergy between the investing organization and portfolio companies, and secondly, an inability or unwillingness to transfer knowledge. Thus, before engaging in CVC investments for strategic purposes, managers should create a well-defined set of goals and understand the implications of pursuing these goals for the implementation of CVC units. Disruptive technologies are often seen to

be the main driver for CVC [66]. However, while CVC can have a positive impact on the exploration of new technologies and innovation capability, CVC can also be highly successful when it comes to enhancing existing businesses [100]. Although the exploration of new technologies and markets may generate substantial strategic returns in the future if the new technologies in which organizations invest through CVC prove to be relevant, the uncertainty of an investment increases when sought exploration is higher [89]. Moreover, the necessity of knowledge transfer is also increasing with an increasing level of exploration [100]. Thus, managers should carefully consider whether CVC is the right tool for their organization to pursue explorative activities.

Our study suggests that CVC units pursuing to strengthen the current core business of an organization and CVC units pursuing to identify new technologies and markets are at the opposite ends of a continuum. When internal R&D is already exhibiting high levels of innovation performance, managers should question the necessity of additionally investing in new ventures to pursue exploration, since this may lead to resource conflicts with internal R&D. This could rather strengthen the not-invented-here syndrome, since employees do not perceive additional value in sourcing external knowledge if their internal innovation performance is already high. In fact, CVC units may in this situation be more useful when they pursue to complement internal R&D and create learning effects beneficial for both the investing organization and the portfolio companies. To overcome internal barriers to open innovation, clearly communicating these learning effects can convince employees of the usefulness of CVC. For organizations that pursue complementarities by investing in the ecosystem around the core business, CVC may enable organization to shift between exploration and exploitation, such that a sequential approach to ambidexterity should be implemented. However, this requires continuous adaptations of the provided CVC unit autonomy, and eventually shifting leadership styles in the form of opening and closing leader behavior [106], which support exploratory behavior and experimentation, or confirmatory behavior and a focus on efficiency, respectively.

If an organization aims at only pursuing either exploitative or explorative activities through CVC, the CVC unit can be structured according to the structural ambidexterity approach, referring to a structural separation from the organization with a clear set of strategic goals. If the investing organization attempts to pursue both exploration and exploitation with a single CVC unit, CVC implementation is rendered a much more complex endeavor. Given that the level of autonomy is suggested to be low for exploitation and high for exploration activities, a contextual approach to ambidexterity should be pursued, with clear dedication of individuals to either explorative or exploitative goals.

5.3. Limitations

Despite the contributions this study provides for research and practice, the study design is limited by the focus on the dyadic relationship between the investing organization and the CVC unit. The relationship between the CVC unit and the portfolio companies has been excluded from the examination of how pursuing strategic objectives can benefit the investing organization. The relationship between the CVC unit and the portfolio company requires great attention in terms of safeguards for both parties, protecting the interests of both the CVC unit and the portfolio company [68]. Moreover, previous research finds that entrepreneurs may want to limit the influence of the investing organization on their start-up [107]. However, if firms want to strategically benefit from CVC investments, they may often search for ways of how to steer the direction of the start-ups they invested in, in particular, in view of *strengthening* and *complementing objectives*. The relationship between the CVC unit and the portfolio companies was, however, excluded in our research design. Future research is encouraged to address this issue and identify ways for the individual strategic objectives which types of CVC unit participation, such as providing resources or managerial consulting to portfolio companies, complement the pursuit of successfully achieving the desired strategic goals.

A second limitation is that we exclusively focus on CVC as a strategy to acquire external knowledge. However, CVC investments are only one way to engage in external technology and knowledge sourcing

and are part of a broader portfolio of possible strategies, such as alliances and acquisitions [42]. As we outlined earlier, the use of CVC besides other strategies can limit the potential learning effect. Therefore, it must be clear to the investing organizations which objectives should be pursued by which mode of external sourcing, such that the different sourcing strategies can complement each other [42], and thus, a portfolio view is necessary to fully understand the potential of CVC in context of other forms of external R&D activities [101]. We suggest future research to extend the suggested framework and its strategic goals by examining which forms of external R&D activities hinder or complement achieving the three identified categories of strategic objectives of CVC.

Lastly, this study primarily focuses on how organizations can access different forms of external knowledge through CVC. While this constitutes a necessary requirement in order to strategically benefit from CVC as a form of open innovation, there is only little evidence on how organizations ultimately implement this knowledge into final products and services. The “paradox of openness” consolidates this central issue—while organizations are required to be open for accessing external knowledge, the commercialization of said knowledge in the form of innovations, requires protection [108]. Since the three categories of the identified strategic objectives of CVC aim at different forms of knowledge from the perspective of the investing organization, the proprietary knowledge involved in each of these strategic objectives is most likely to differ. Consequently, organizations must consider the pursued objectives and the corresponding knowledge protection in an integrative way [109]. Thus, we expect that different protection mechanisms for a successful commercialization are required when pursuing different strategic objectives through CVC. Further research is encouraged to investigate in more detail how an organization can successfully commercialize knowledge gained through CVC, contingent on the type of strategic objective, and which corresponding protection mechanisms are required.

6. Conclusions

This paper addresses the central question of which strategic objectives can be pursued by CVC and which structural integration of CVC units is required for pursuing different strategic objectives. CVC can constitute a powerful tool for organizations to tap into the external knowledge of new ventures, providing more than merely financial benefits. Viewing CVC as a tool for open innovation, a strategic perspective allows organizations to benefit in the long-term and strengthen their competitive position. In addition, CVC investments constitute an approach to establish ambidextrous structures, enabling organizations to perform exploitation and exploration through partnerships with new ventures. Thereby, CVC can enable organizations to pursue incremental innovations by improving internal capabilities and existing products, or to pursue radical innovations by exposing the organization to new technologies and markets. In view of open innovation practices, CVC investments create opportunities to strategically benefit from external knowledge inflows, which ultimately increase the innovation performance of the investing firm.

However, in order to benefit from CVC, organizations must define a clear set of strategic goals that are targeted through this form of external knowledge and technology sourcing. A successful implementation of a CVC unit is contingent on the consistency of the defined objectives, since contradicting objectives render successful investments impossible. This study provides three sets of strategic objectives that can be pursued through CVC, that are consistent within the three individual objective sets, and which limitations and barriers can hinder the realization of benefits from CVC. In particular, through CVC organizations can (a) improve and strengthen the core business and the existing products, (b) strengthen and leverage the ecosystem around the core business, especially through complementarities, and (c) gain access to new technologies and markets unrelated to the core business.

We suggest a framework embedded in ambidexterity that supports organizations to identify a feasible approach of establishing a CVC unit based on which strategic objectives are pursued. Organizations seeking to strengthen their core business and to increase exploitative capabilities, the CVC unit strategy must be closely aligned with the general innovation strategy of the organization,

such that the CVC unit does not require high autonomy. In contrast, when the objective of the CVC unit is to explore new technologies and markets unrelated to the core business, aiming to enhance the portfolio of the investing firm, the CVC unit must be provided with higher levels of autonomy in order to not be restricted through organizational strategic boundaries.

Ultimately, CVC constitutes an approach to engage in open innovation practices allowing to overcome the boundaries that naturally limit the internal R&D ability and performance. External knowledge inflows created through CVC can allow to overcome the local search bias, and thus can contribute to create more innovative ideas and solutions.

While CVC has been identified as a versatile way for organizations to acquire external knowledge, we encourage future research to identify which other external venturing strategies, such as acquisitions or alliances, complement CVC investments and enhance the potential benefits from external technology and knowledge sourcing strategies from a portfolio perspective. Our suggested framework provides a conceptual foundation for future research to extend the knowledge of how organizations can engage in open innovation, which ultimately can enhance the innovation performance of organizations and thus, contribute to the survival of firms.

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