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Harmonizing corporate venturing dimensions and its characteristics: a systematic analysis

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Abstract
The research literature on Corporate Venturing (CV) has increased over the last few years. While research mainly focuses on analyzing one single CV dimension (e.g. Ambidexterity, etc.) or the interplay between selected dimensions, rarely does research cover and explain all CV dimensions and their characteristics holistically. This paper analyzes the status quo of different CV dimensions and their characteristics. To do so, we identified 100 studies we first used to perform a bibliometric analysis. After that, we executed a conceptual systematic literature review (SLR), updating and extending an existing research paper written by Gutmann (Manag Rev Q 69(2):121–157, 2018). The bibliometric analysis results help objectively evaluate and describe the research landscape and point out leading countries, main keywords, main cited papers, and main research clusters of our CV research. We discovered three new dimensions within our SLR: Relatedness, Time Horizon, and Development Stage. In addition, we show new findings within the 7 CV dimensions described by the existing research paper. Even though the characteristics within each dimension have, to some extent, developed significantly over time, each of the dimensions described in this paper contains substantial new knowledge. e.g. previously the dimension "Link to the corporate firm" mainly covered operational and structural linkages. However, we distinguish these linkages between operational and strategic autonomy.

Keywords Corporate venturing · Corporate venturing dimensions · Innovation management · Entrepreneurship · Systematic literature review · Bibliometric analysis

JEL Classification G24 · L1 · L21 · L26 · M10

Extended author information available on the last page of the article

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1 Introduction

Successful companies can often fail or get disrupted by innovative technologies or business models (Christensen 1997). Therefore, the importance of innovation for established companies is a well-recognized and necessary strategic objective (Drover et al. 2017; Dushnitsky and Lenox 2006) to stay relevant and competitive (Fenwick and Vermeulen 2015). To overcome internal rigidity and benefit strategically and financially from collaboration with and support of startups, corporate venturing (CV) and its modes have emerged as a core activity (Haslanger et al. 2022). Early CV research has primarily focused on individual dimensions and partial phenomena such as ambidexterity (March 1991) or the origin of the venture (Thornhill and Amit 2001; Miles and Covin 2002; Hill and Birkinshaw 2008; Johnson 2012) and different CV modes. The heterogeneity of these CV modes has always been at the core of CV literature and motivated researchers to develop classifications and identify differences between modes such as CVC, strategic alliances, spin-offs, joint ventures, acquisitions, and incubation programs (Roberts and Berry 1985; Schildt et al. 2005; Weiblen and Chesbrough 2015; Enkel and Sagmeister 2020). Because early research was still fragmented and practitioners needed a holistic understanding for their decision-making, Narayanan et al. (2009) synthesized, linked, and integrated prior key findings. Later, Gutmann (2018) extended the work by comprehensively categorizing the heterogeneity of different CV modes.

However, in recent years, the discussion on corporate venturing and its dimensions and characteristics is ongoing, and the research area is evolving. Many new characteristics that have not been considered and included in Gutmann's (2018) publication have been found, so his paper is missing out on new critical empirical findings. As an example, some researchers focused on the organizational set-up and the parent firm's boundaries (Waldkirch et al. 2021), the program duration (Kurpjuweit and Wagner 2020) or the performance effects of individual CV modes (Haslanger et al. 2022). Other authors continue to further develop ongoing discussions on ambidexterity (Weiss and Kanbach 2022) or focus on CV strategies for individual markets (Ohara and Mefford 2023). Because of new findings like these, there remains great interest in the characteristics and research streams of corporate venturing to better understand when and how firms successfully implement CV (Cock et al. 2020) and to help practitioners make decisions that include the latest CV findings in their CV considerations.

Therefore, the purpose of this paper is to fully and comprehensively characterize the dimensions of CVs that established corporations use to create and integrate new business creations. It should include the latest discussion on the CV dimensions and include and discuss newly found dimensions and their characteristics, extending Gutmann's (2018) discussion. Our study identifies and explains 10 CV dimensions and their characteristics included in the newly introduced framework that represents the different levels of decision-making and relevance: CV strategy, organizational profile, and venture focus. Those 10 dimensions synthesize the current understanding of how we view CV. The different dimensions and their characteristics deepen

the scientific understanding of the domain. They can serve as a basis for practitioners' decision-making, helping to consider all essential aspects before deciding how to proceed with their CV project.

Before discussing the detailed research question, we think it is beneficial to make two remarks to avoid confusion about CV and the different distinct CV modes. This should help to gain more clarity when discussing CV.

1.1 CV as a subcategory of the corporate entrepreneurship (CE) literature

Our research ranges in the research area of Corporate Entrepreneurship. The definition and demarcation of CE has led to some confusion in the past (Covin and Miles 1999), which is why the label entrepreneurial can be reserved for innovative firms (Covin and Miles 1999). Covin and Miles (1999) state that "innovation is the single common theme underlying all forms of corporate entrepreneurship". This aligns with other authors who have seen innovation as the"heart of entrepreneurship" (Stevenson and Gumpert 1985). While focusing on innovation, Kuratko et al. (2015) summarize different purposes of established organizations for CE, such as profitability (Vozikis et al. 1999), strategic renewal (Guth and Ginsberg 1990), innovativeness (Baden-Fuller 1995), development of future revenue streams (Mcgrath et al. 2006) and developing competitive advantage (Covin and Miles 1999). Especially the creation of competitive advantage and its impact on performance and wealth creation has been the research subject lately (Hitt et al. 2001; Ireland et al. 2003; Ireland and Webb 2007).

Early research was done by Sharma and Chrisman (1999), which has gained acceptance among the scholarly community (Narayanan et al. 2009; Reimsbach and Hauschild 2012; Gutmann 2018; Urbano et al. 2022) interpretates that CE encompasses the activities of individuals within established corporations that "create a new organization or instigate renewal or innovation within that organization". This definition emphasizes the entrepreneurial nature of these activities and their potential to bring organizational change. While Sharma and Chrisman (1999) only differentiated between two distinct categories, namely strategic renewal (changes in corporations' business activities, structures, or strategies, which impact existing relationships within the corporation or with external parties) and corporate venturing (entrepreneurial activities that create new businesses for the corporation by establishing internal or external ventures), Morris et al. (2011) suggested a broader differentiation of CE between corporate venturing and strategic entrepreneurship. While Morris et al. (2011) follow Sharma and Chrisman's (1999) definition of CV as an individual category, the authors add two subcategories, namely internal CV (innovation created within the firm) and external CV (innovation created outside the firm). The initial category from Sharma and Chrisman (1999) "strategic renewal" is considered one out of five strategic entrepreneurship sub-categories, which are strategic renewal, sustained regeneration, domain redefinition, organizational rejuvenation, and business model reconstruction (Covin and Miles 1999; Hitt et al. 2001; Ireland et al. 2003; Ireland and Webb 2007; Morris et al. 2011). This paper mainly focuses on external corporate venturing as a means of new business creation.

1.2 CV consists of different distinct CV modes

In corporate venturing, various modes exist, each representing a distinct category of organizational collaborations (Roberts and Berry 1985; Schildt et al. 2005). These modes encompass various activities and exhibit variations within their categories, challenging their differentiation. The primary modes include corporate venture capital (CVC), joint ventures, acquisitions, alliances, spin-offs, and startup programs. These modes are analyzed towards similar characteristics, describing the CV mode. Clustering similar characteristics in one super-category results in the individual dimensions that can be shown in a typology.

CVC is the most extensively researched mode due to its heterogeneity (Narayanan et al. 2009) and availability of secondary data for analysis (Garrett and Covin 2015). CVC involves "equity investments in entrepreneurial ventures by incumbent firms" (Dushnitsky and Lenox 2005), and it is sometimes used synonymously with CV, e.g. (Miles and Covin 2002; Weiblen and Chesbrough 2015).

Alliances are characterized by cooperation agreements that enable access to partner resources and foster joint knowledge creation (Keil et al. 2008). These contracts don't involve equity and vary between buyer–supplier relationships, licensing, and strategic alliances (Simon et al. 2019). However, alliances are often combined with CVC or become its strategic objective (Gonzales and Ohara 2019; Enkel and Sagmeister 2020), making distinguishing them as individual modes challenging. Moreover, alliances are not necessarily pursued within the context of CV but in collaboration with other established corporations, which vastly reduces the relevant literature (Narayanan et al. 2009).

Joint ventures involve collaborations between two or more corporations, jointly creating a new venture where each partner retains an equity stake in the company (Titus et al. 2017). On the other hand, spin-offs are ventures that originate within the corporation, i.e., the knowledge and competencies were developed internally and subsequently became separate legal entities (Parhankangas and Arenius 2003; Clarysse et al. 2011).

Acquisitions, also known as mergers and acquisitions (M&A) (Puranam et al. 2006), entail corporations making substantial commitments by acquiring a majority stake in startups (Schildt et al. 2005; Titus et al. 2017). Similarly to alliances, it is crucial to distinguish between acquisitions of young ventures and established corporations (Benson and Ziedonis 2009; Titus et al. 2017).

Lastly, the most recent mode of CV is represented by startup programs, which involve supporting a cohort of startups with services and resources (Becker and Gassmann 2006; Weiblen and Chesbrough 2015; Kohler 2016). These programs encompass various initiatives such as incubators (Weiblen and Chesbrough 2015), accelerators (Kohler 2016), and startup-supplier programs (Kurpjuweit and Wagner 2020).

While all these CV modes exhibit distinct organizational characteristics, the need for a harmonization based on a comprehensive set of dimensions is crucial. Existing typologies of CV modes often focus on limited dimensions and lack a conclusive analysis of all, e.g. (Miles and Covin 2002; Becker and Gassmann 2006; Weiblen and Chesbrough 2015). Therefore, the harmonization will

enable researchers and practitioners to understand the similarities and differences between the modes, identify common objectives, strategies, and outcomes, and uncover the underlying mechanisms that drive successful CV activities.

1.3 Research questions (RQ)

The first research question (RQ) will be answered by a bibliometric analysis approach to give an overview of the current literature landscape. The following two research questions will be answered by a systematic literature review. While our work is based on a publication from Gutmann (2018), he uses conceptual and empirical papers simultaneously. We exclusively focus on empirical studies to look at the scientific evidence and profound knowledge approved by the research community. This also supports our future goal mentioned in the introduction, that we see the dimensions and characteristics developed in the SLR as a basis for future taxonomy development. Solely focusing on empirical papers is quite common and has also been used by other researchers (Dushnitsky and Lavie 2010; Narayanan et al. 2009).

First, we want to clarify if the current research front represents the knowledge base of CV literature, leading to our first research question:

RQ1: How is the CV research community structured?

As mentioned, we want to build on and extend the existing research. Our goal is to identify the characteristics that describe the different CV modes collectively exhaustive because the existing research streams are fragmented (Narayanan et al. 2009). This leads to the second and third research questions:

RQ2: Which of the dimensions from Gutmann (2018) can be confirmed from an empirical point of view?

RQ3: What are the dimensions of corporate venturing that established corporations use to create and integrate new business creation, and how can those be characterized?

2 Previous research

This section gives an overview of the existing research in harmonizing different corporate venturing dimensions and their characteristics. It aims to provide the basis for our further work and explains why an update on this highly complex topic is necessary.

2.1 Existing SLRs in literature

Before conducting an SLR on the characteristics that describe the dimensions for CV, we did an initial search to understand the existing research landscape and identify if the planned research will be a new contribution to the research community or if the research already exists. We conducted a systematic analysis using the Web of Science and Scopus databases. We used the following search parameters and their' synonyms to look for existing literature reviews that could be in our scope:

- Systematic Literature Review (SLR) as publication type
- Corporate Venturing as research field

Most of the SLRs were either too specific or did not focus on the dimensions used to classify corporate venturing and its modes and were therefore excluded. Only four publications written by Miles and Covin (2002), Narayanan et al. (2009), Reimsbach and Hauschild (2012) and Gutmann (2018) could be considered, as they holistically analyzed the modes of CV. All four met our initial idea of creating a framework for corporate venturing that distinguishes the dimensions of all CV modes, providing a comprehensive understanding for researchers and practitioners. Although the reviews by Miles and Covin (2002), Narayanan et al. (2009) and Reimsbach and Hauschild (2012) provide valuable insights, Gutmann's (2018) work is the most recent and exhaustive one. It represents the former status quo of the CV literature, including the previously published papers, while no further reviews have been published since. In addition, we identified that there has been a research gap since the publication from Gutmann (2018), showing new knowledge that is not yet included in the existing categories. Thus, we decided to set Gutmann's (2018) research as a foundation for our work. To mention only one example out of many, the research on ambidexterity was previously only distinguishing between exploration and exploitation, while Shuwaikh et al. (2022a) realized in 2022 that CV units can also achieve ambidexterity across periods by first exploring or exploiting and subsequently pursuing the complement.

2.2 Review from Gutmann (2018)

The existing SLR, "Harmonizing corporate venturing modes: an integrative review and research agenda" was written by Gutmann (2018). The author only included research papers with at least a "C" rating according to JOURNAL 3, a rating from the German Academic Association for Business Research (VHB). A "C" or higher rating is considered a relevant academic contribution. The research considered publications between 1995 and 2017, analyzing a preliminary sample of 349 papers, resulting in a final sample of 32 papers. In Table 1, we summarized the key message of Gutmann's (2018) seven corporate venturing dimensions:

Table 1 CV dimensions and key message according to Gutmann (2018)

Dimension	Key message
Locus of opportunity (internal/external)	Differentiation between the internal and external nature of the new business opportunity Ambiguity between the origination of the idea or the resulting legal entity Organizational support might also play a role, as well as (former) employees' initiatives and the degree of using internal vs. external resources
Prioritization of objectives (strategic/financial)	Differentiation between financial (risk diversification and financial returns) and strategic aims (accelerating pace of business innovation, a window on emerging technologies, fostering opportunities) Balanced/hybrid approach possible
Ambidexterity (explore/exploit)	Differentiation between exploration (need for adaptation) and exploitation (need for alignment) To achieve both is referred to as an ambidextrous organization resulting in long-term performance
Link to the corporate firm (tight/loose)	Finds description of scholars "somehow ambiguous" Focus either on operational links between startup and corporation or structural links between CV unit and corporation It is also referred to by the extent of innovation, relatedness (Sharma and Chrisman 1999), and degree of (in-)dependence on organizational structures and processes (Weber and Weber 2005) The relationship is either described as tight or loose
Level of investment intermediation (direct/indirect)	Status quo exclusively on financial investments Differentiation between direct (parent company directly invests in the company) and indirect (parent company invests through a financial intermediary) investment Direct investments preferred for strategic objectives and indirect ones for financial objectives
Equity involvement yes/no)	Differentiation of whether or not the corporation takes an equity position CVC (equity) potentially fails to leverage complementarities Novel non-equity collaboration models are emerging, such as CAs (Kohler 2016; Pauwels et al. 2016) or models described by Weiblen and Chesbrough (2015)
Direction of innovation flow (outside-in/inside-out)	Describes the way of innovation flow from inside the company to outside the company or vice versa (inside-out and outside-in) Innovation flow between both parties (parent corporation and venture) can lead to a win–win situation (Kohler 2016) In-sourcing entrepreneurial innovations is understood as outside-in innovation flow (CVC, CA, etc.) Pushing inventions to the market is understood as inside-out (licensing, incubation, and spin-off)

2.3 Update of existing research paper

Even though Gutmann (2018) pointed out many essential dimensions and explained the different characteristics of those dimensions, an update of the existing paper is necessary for the following reasons.

First, we were curious about the development of the current CV research front over the last six years since Gutmann (2018) published his work. While Gutmann (2018) found a preliminary sample of 349 papers, we found that in the last six years between 2018 and January 2024 in the database Web of Science alone, another 160 articles were published. Taken together with Gutmann's (2018) sample, the last six years represent a third of the total CV literature. When analyzing the newer research, we find that not only the amount of publications has increased but also the new developments that have not all been included in the existing SLR. Here, Gutmann (2018) is missing out on new developments that complement various of his dimensions. Therefore, a new perspective emerged. One example has been made in Chapter 2.1 already regarding ambidexterity. Also, the development of the knowledge indicated that newer research cannot always be clustered in the existing dimensions, and therefore, additional dimensions are conceivable. This extension of its work also aligns with the author, encouraging further researchers to extend his work by discovering more characteristics for the dimensions and even more dimensions in the first place. Gutmann (2018) further explains that, to some extent, there are still inconsistencies between the different authors and dimensions (e.g., 'locus of opportunity') and that some categories couldn't be included in his framework. The new publications might solve these issues.

Second, we wanted to include a comprehensive forward and backward search in our work, which was only partially included in the previous work. Gutmann (2018) only mentions that the sources are "carefully revised and checked for cross-references, by which two additional articles were identified and added to the final list". However, it is not transparent if a complete forward and backward search was included in the previous paper, so we included one in our new study to avoid missing out on essential studies. Fisch and Block (2018) point out that writing a high-quality literature review takes a deep understanding of all processes and skills. According to Webster and Watson (2002), one crucial process is a forward and backward search, which is essential to not miss out on important publications and to achieve scientific rigor.

Our analysis will help academic researchers to get an overview of the dimensions and help practitioners to gain more insights to help them in their decision-making.

3 Methodology

This literature review identifies corporate venturing dimensions and their characteristics, which is why we use tips from Fisch and Block (2018) and Clark et al. (2021) to focus on concepts and not just studies. In addition, we use the well-known and often-used methodologies from Webster and Watson (2002), Kitchenham and Charters (2007), and Kitchenham et al. (2009) as a base for our analysis.

We wanted to be as close as possible to the original search criteria because we see the previous work as a basis that should be extended. This is why we used the same search stream using Boolean operators (AND; OR) and wildcard characters (*). The search for our paper was defined as follows: ("corporate venturing" OR ("corporate vent*" AND ("activities" OR "framework" OR "typology" OR "characteristics" OR "dimensions" OR "model" OR "mode"))) (Gutmann 2018). We also continued the restriction to only include studies written in English from journals with a minimum rating of "C" or higher, according to the JOURQUAL 3 (VHB).

We used the databanks Web of Science, Scopus, and Ebsco for our analysis. After filtering out duplicates between 2018 and January 2024, we found an initial sample of 144 papers. Two authors have analyzed each study for inclusion or exclusion to assure replicability. For this, each researcher analyzed the title and abstract of the individual paper in a first step. If there was a mismatch of the inclusion or exclusion, potential concerns were discussed until a common understanding was achieved. As mentioned above, studies not written in English and with a minimum rating below "C" according to the JOURNAL 3 (VHB) are excluded. Furthermore, the data had to be collected empirically, while conceptual papers were excluded. According to Brereton et al. (2007), we excluded studies where no title and/or abstract was found or the title and/or abstract provided insufficient information. Our analysis included a study to determine if it contains information that describes, classifies, or categorizes CV or its different modes. We were especially interested in papers focusing on innovation and/or financial performance.

This initial review of the current research front allowed us to assess whether the dimensions considered by Gutmann (2018) are still used in the scientific literature and if developments have been made or even new ones have emerged. Based on a qualitative review and comparison, we found indications of multiple new characteristics and dimensions that are relevant and distinct from those described by Gutmann (2018) in his framework, as well as advances that account for existing characteristics. Furthermore, at this point, we also highlight that Gutmann (2018) found the description of 'locus of opportunity' ambiguous. We aim to clarify and complement this and the other dimensions in more detail.

Therefore, the 37 studies were used to perform a forward and backward search in an open timespan, as the previous work by Gutmann (2018) was limited to a keyword search. Furthermore, this is a necessary step to fully capture the knowledge base of the CV literature, as our aim is not only to cover the recent research front but, overall, to create a systematic and exhaustive review. In addition, the forward and backward searches find the most relevant literature considered by the research front and identify significant works that would not have been found using the

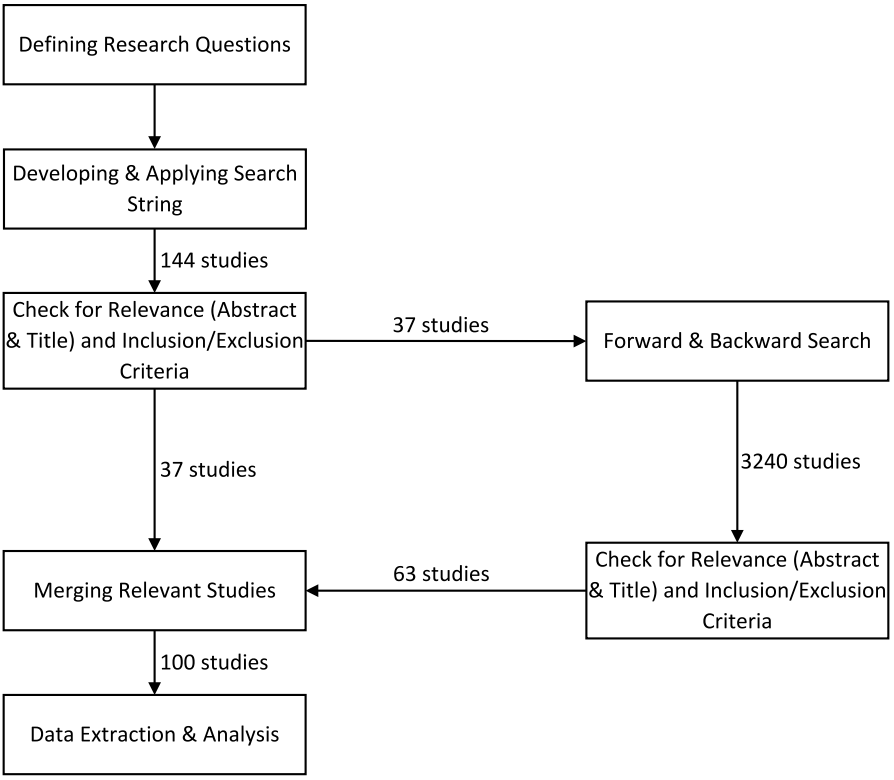

Fig. 1 Symbolized search process on CV dimensions

keyword search (Webster and Watson 2002). This led to another preliminary sample of 3240 studies. The titles and abstracts of these studies have been analyzed the same way by two researchers, resulting in another 63 relevant studies and giving 100 final studies to work on. Figure 1 symbolizes the overall search process.

The preliminary review of the recent publications from 2018 to January 2024 further enabled us to identify the most relevant dimensions of the CV literature, which we adopted to summarize the publications of the entire sample based on Webster and Watson's (2002) concept-based approach. This also follows Fisch and Block's (2018) suggestion to focus on concepts rather than studies, which we could then summarize. In doing so, we have ensured that all relevant works and topics are included to represent the literature landscape as precisely as possible while maintaining clarity and comprehensibility and finding meaningful conclusions (Clark et al. 2021).

To answer RQ1, we also performed a bibliometric analysis. For this, we used all of our 100 identified studies, representing the research landscape towards corporate venturing dimensions over the last 38 years (the first study was done in 1985), as can be seen in Fig. 2. We performed a bibliographic coupling analysis, visualizing the connections of all documents and their geographical origin, highlighted by the year

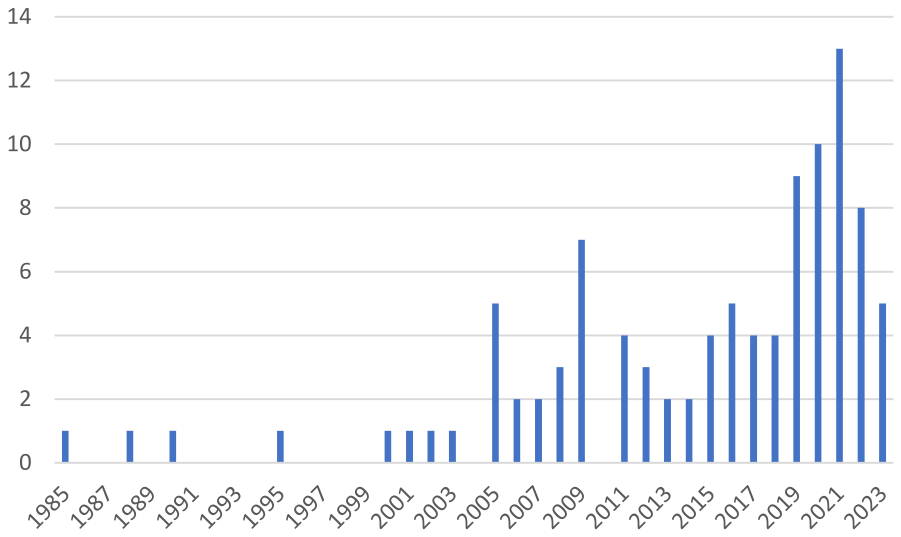

Fig. 2 Articles of SLR sample (100 studies) published by year

of publication and the number of citations. This approach utilizes the thematical connections between papers based on their similarity of references and is especially meaningful for more recent publications because it is time-independent (Donthu et al. 2021). In addition, a co-citation analysis shows the 93 most co-cited documents from our initial sample (5492 papers), which was applied with a minimum threshold of 5 co-citations. The minimum threshold helped us maintain clarity and comprehensibility regarding the visualization. The complete list of papers is in the appendix. We found that 17 out of the 93 papers are included in our sample for the SLR. This approach shows the connections of jointly cited publications and, thus, is likely to be different from the initial sample. However, in contrast to bibliographic coupling, the co-citation analysis depends on the number of citations, thus revealing the intellectual structure of the field and disregarding topics that are niche or recently published (Donthu et al. 2021). Therefore, both approaches are used complementary to gather an extensive overview of the literature. Finally, a co-occurrence analysis of the author's keywords visualizes context-specific clusters and relationships of the most frequently occurring topics, adding a more in-depth analysis (Zupic and Čater 2015). Overall, the bibliometric analysis, including a bibliographic coupling, co-citation, and co-word analysis, is meaningful based on the broad scope of CV (Donthu et al. 2021) and will increase scientific rigor, mitigate researchers' bias, and improve the objectivity of the systematic review (Zupic and Čater 2015).

All bibliometric analyses are carried out using the Visualization of Similarities (VOS) approach developed by Waltman et al. (2010). Their software tool, the VOSviewer, has been suggested and applied by many researchers before to visualize multiple bibliometric networks, such as bibliographic coupling and co-citation analysis, via a distance-based approach (Donthu et al. 2021; Röhm 2018). Prior to the analyses, the VOSviewer implements by default a normalization process called

association strength normalization (van Eck and Waltman 2009). Followingly, the positioning of the nodes in a two-dimensional space is selected by locating strongly related nodes close to each other and weakly related ones more distant. This is implemented through the VOS mapping technique (van Eck et al. 2010). Furthermore, the VOSviewer applies an intelligent local moving algorithm for assigning closely related nodes to a cluster, in which the number of clusters depends on a resolution parameter (Waltman et al. 2010; Waltman and van Eck 2013).

The necessary information regarding the bibliometric data was primarily gathered through the SCOPUS database. However, four out of the 100 papers were not included in the database, e.g. (Miles and Covin 2002), three had incomplete information, e.g. (Hill et al. 2008), and another three papers had inconsistent data, e.g. (Sorrentino and Williams 1995). The missing information for these papers was gathered manually. Additionally, the phrasing of references from SCOPUS is not harmonized, which is a necessary condition for matching citations within the bibliographic analysis. We have, therefore, standardized inconsistencies between references, whether they were due to misspellings or different versions of publications, by taking into account the author's initials (e.g., Spender J.-C. to Spender J.C. or Chesbrough H. to Chesbrough H.W.) and other publication details such as year, source title, number of pages, volume, and issue.

4 Results

In this chapter, based on newer research, we show that the characteristics of Gutmann's (2018) dimensions must be extended, and even new dimensions must be named. The bibliometric analysis shows the extension of already existing research clusters.

4.1 Bibliometric analysis

The first part of the bibliometric coupling analysis considers the researcher countries, with the color of the nodes representing the average year of publication and its size visualizing the relative number of publications (Fig. 3). In total, the bibliometric data from SCOPUS revealed 29 countries. One paper from Thailand (Gerdsri and Manotungvorapun 2021) is not included in the network due to missing linkages with other publications based on its references. The highest distribution of research comes from the United States (39), followed by Germany (22), the UK (13), Italy (9), and Switzerland (7). While publications from the US, UK, and Switzerland are relatively old, with an average of 2013, Germany and Italy contributed, on average, more recent papers from 2017 and 2016. These results regarding the frequency and

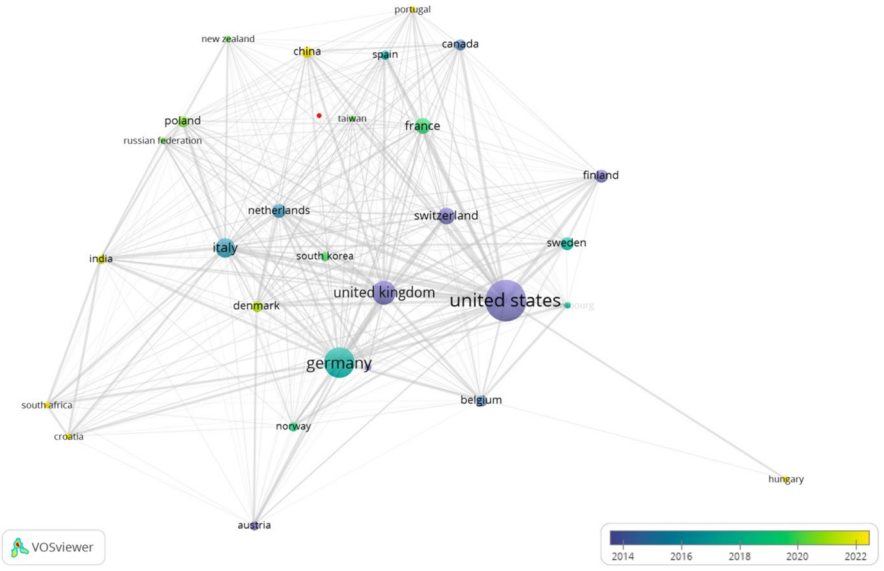

Fig. 3 Bibliographic coupling of countries (clustered by year)

timespan are consistent with the findings of Narayanan et al. (2009), who placed a strong emphasis on the US in their review of CV from 1995 to 2004. Countries with just a few publications have been primarily published in the last five years, showing researchers' increased interest in CV. The only exceptions are Finland and Australia (2009). Furthermore, while the earlier literature was dominated by European and American research, the more recently published papers also frequently come from Asia, including China, India, Taiwan, and South Korea.

The relationships based on the bibliographic coupling of the 100 documents from the literature review are shown in Fig. 4. The development of the literature over time is displayed by the nodes marked by the year of publication. Most highly cited publications are from before 2005, drawn in a purple color and oriented at the left side of the network, which established the knowledge base of CV. These include papers such as Roberts and Berry (1985), Siegel et al. (1988), Sorrentino and Williams (1995), and Miles and Covin (2002). It is also evident that based on the bibliographic coupling analysis, these papers are the least connected and, therefore, not central in the network due to their focus of analysis and time disparity. From 2005 onwards, the focus of research shifted to analyzing CV outcomes, whether in terms of strategic benefits such as patenting or financial performance (Dushnitsky and Lenox 2005; Hill et al. 2008). Also, researchers started to empirically compare diverse organizational modes, including CVCs, spin-offs, alliances, acquisitions, and internal corporate ventures (Schildt et al. 2005; Zahra and Hayton 2008; Keil et al. 2008; Hill and Birkinshaw 2008, 2014). Highlighted in purple to blue tones, these distributions still receive many citations and are more connected to the current research front. From 2015 onwards, shown in green to yellow and located mainly on the right-hand side of the network, the CV research is split between CVC and

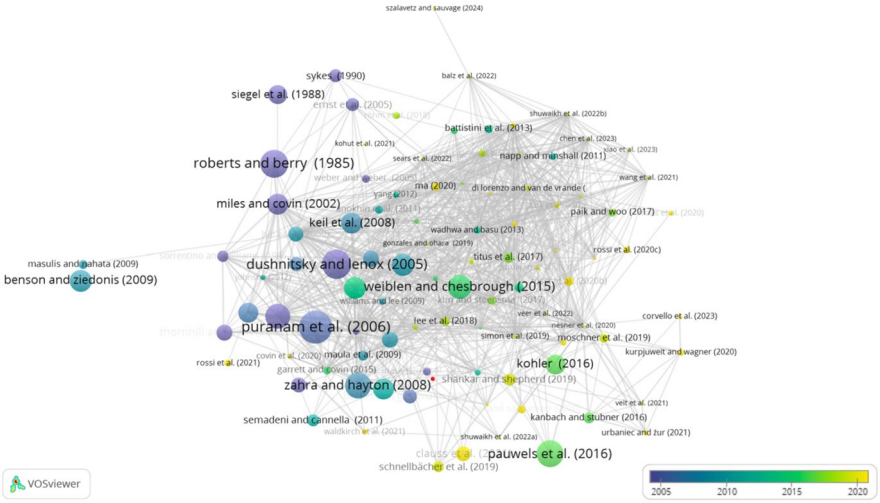

Fig. 4 Bibliographic coupling of documents (Average publication year)

closer collaboration models such as CAs. The upper right corner of the network contains exclusively CVC studies, e.g. (Rossi et al. 2020c; Huang and Madhavan 2021; Shuwaikh et al. 2022b), while the lower right corner contains exclusively CA studies, e.g. (Kohler 2016; Kanbach and Stubner 2016; Pauwels et al. 2016). A further example would be the paper of Weiblen and Chesbrough (2015), located between the two streams of literature, which discusses the differences between CVCs and collaboration programs. While the literature on CAs has gained considerable traction, recent CVC research has not yet caught up with the knowledge base established before 2005.

A co-citation analysis is conducted after the bibliographic coupling analyses, based on connecting papers that cite the same document, linking jointly cited documents (Fig. 5). This technique assumes that articles frequently cited together are thematically close and that the higher the number of co-citations, the more influential the publications are (Donthu et al. 2021). In contrast to the bibliographic coupling, the resulting linked papers from the co-citation analysis do not necessarily belong to the previous 100 selected papers from our research scope. As mentioned in Chapter 3, we used a threshold of 5, resulting in 93 papers, from which 17 are out of our SLR. This is due to our specific scope of empirical CV literature describing its dimensions. However, the literature sample extending our focus allows future researchers, particularly in the field of CVC, to gain a comprehensive insight into the knowledge base.

In Fig. 5, the nodes' size represents the number of co-citations. The most cited papers are Dushnitsky and Lenox (2005) and Dushnitsky and Lenox (2006), with 29 citations focusing on the antecedents and outcomes of CVC. Besides the literature that specifically focuses on CV, other research streams that have been very highly cited from our sample include Cohen and Levinthal's (1990) concept of 'absorptive capacity', March's (1991) concept of 'exploration and exploitation', and Chesbrough's (2003) concept of 'open innovation'.

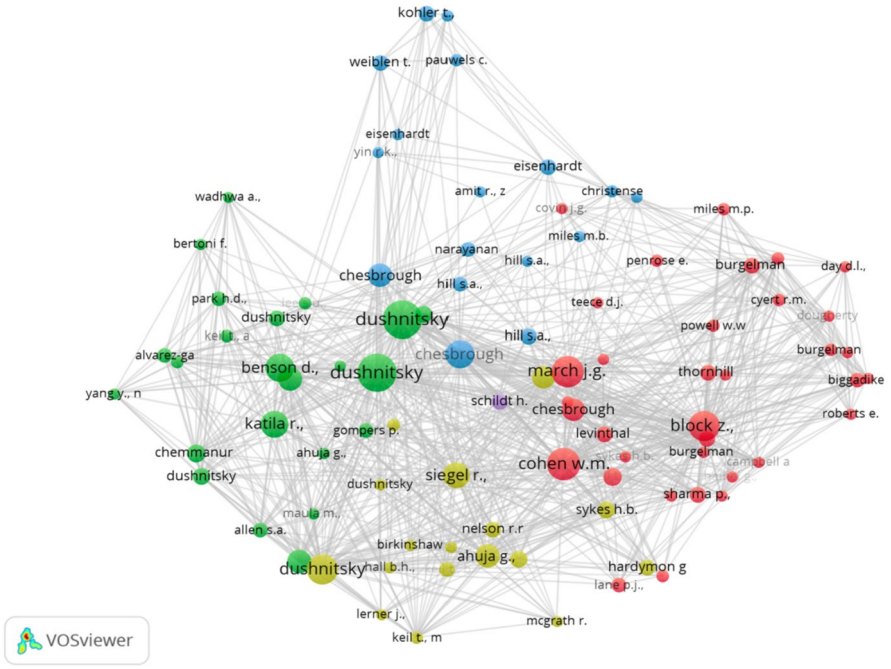

Fig. 5 Co-Citation analysis including Top 93 co-cited papers (Threshold 5 co-citations)

The co-citation is especially meaningful in clarifying the knowledge base and, thus, primarily refers to older publications. The oldest CV-related publication is from Rind (1981), who analyzed the role of venture capital in corporate development. In contrast, the most recent publications that are highly cited are on one side from the CVC stream, including Wadhwa et al. (2016), Alvarez-Garrido and Dushnitsky (2016), and Belderbos et al. (2018), and on the other side from the CA literature stream, including Kohler (2016), Pauwels et al. (2016) and Weiblen and Chesbrough (2015). These results further support and complement our previous findings from the bibliographic analysis. Generally, the knowledge base from our sample is highly dominated by CVC literature. Almost a third (34 papers) include the term 'venture capital' in their title. At the same time, other forms are barely mentioned, such as 'alliances' (5), 'accelerators' (3), and 'acquisitions' (2), or not at all in the case of 'spin-offs' and 'joint ventures'.

The cluster analysis based on Waltman et al. (2010) also unveiled four clusters. The red cluster is the biggest, including 35 papers. Its most central publications are from Cohen and Levinthal (1990), Block and MacMillan (1993), and March (1991). Overall, the topics discussed within this cluster involve the innovation performance of corporations in the context of corporate venturing and entrepreneurship. The second biggest cluster is marked in green with 29 papers and primarily evolves around the two publications from Dushnitsky and Lenox (2005) and Dushnitsky and Lenox (2006), focusing on the strategic objective of pursuing CVC to create a window on technology. The third cluster, including 17 papers marked in blue, primarily entails

reviews and typologies on CVC (Chesbrough 2003), CV (Narayanan et al. 2009), and CAs (Weiblen and Chesbrough 2015; Kohler 2016; Pauwels et al. 2016). Lastly, the fourth cluster in yellow includes 17 papers, of which Gompers and Lerner (2000) and Siegel et al. (1988) are the most co-cited. These papers focus on the success factors of CVC (Sykes 1986) and acquisitions (Ahuja and Katila 2001).

In contrast to the prior analyses based on publications, a co-word analysis was performed using the authors' keywords from our sample, a technique to examine the content (Donthu et al. 2021). As the appearance and pooling of keywords are sensitive to the exact wording, we aligned keywords regarding the plural (e.g., "corporate accelerators" to "corporate accelerator") or hyphens (e.g., spinoff to spin-off). To focus on relevant keywords and remaining comprehensibility, the total of 247 keywords was further reduced using a minimum threshold of 2 occurrences, resulting in 36 keywords. The clustering technique based on Waltman et al. (2010) reveals five clusters, which mainly focus on "corporate venture capital" and "corporate venturing". This was expected and supported our scope of CV, further highlighting the interest of researchers in the specific mode of CVC, which was mentioned by 44 researchers in our sample. In contrast, CV itself was mentioned only 16 times. The six keywords within the CVC cluster, marked in yellow, include its main objectives such as "(venture) performance" as well as "radical innovation", which is analyzed in literature with a "meta-analysis". It also reveals that authors commonly compare it to "independent venture capital". The red cluster evolves around "corporate venturing", the second most referred keyword with 16 appearances, and is focused primarily on the entrepreneurial side of CV, including "corporate entr epreneurship"/"entrepreneurship" and strategic-oriented objectives like "innovation performance"/"corporate innovation". The co-word analysis also identified "ambidexterity" as a frequently occurring keyword, marked in blue, which is typically combined with "exploration" and "exploitation", as well as "corporate venture unit" and "survival". Lastly, the fifth cluster includes "open innovation", the CV modes of "alliances" and "acquisitions" as well as the corporation's "absorptive capacity" (Fig. 6).

The co-word analysis is, however, limited to multiple factors. Firstly, selecting keywords is subjective and up to the author's preference. The fact that some authors appear more than once in our analysis may distort the frequency of some concepts and keywords. In addition, research from distinct authors might refer to the same concept using different keywords. Secondly, we did not harmonize keywords that are termed differently within a familiar context, for example, "investment", "investing", and "investor", as this would disregard the focus of each paper and potentially lead to misinterpretations. The same applies to keywords described in more or less detail, such as "partnership" and "asymmetric partnership", which are considered different keywords in our analysis. Lastly, almost a quarter of our sample was not considered, as 22 of the 100 papers contained no keywords.

After performing the bibliometric analysis and getting to know the research landscape, we can, at this point, conclude that the research community is well linked to each other. All major research is known by the community, and there are no research communities that act independently. In the following chapters, we continue with the semantic analysis that characterizes the dimensions of CV.

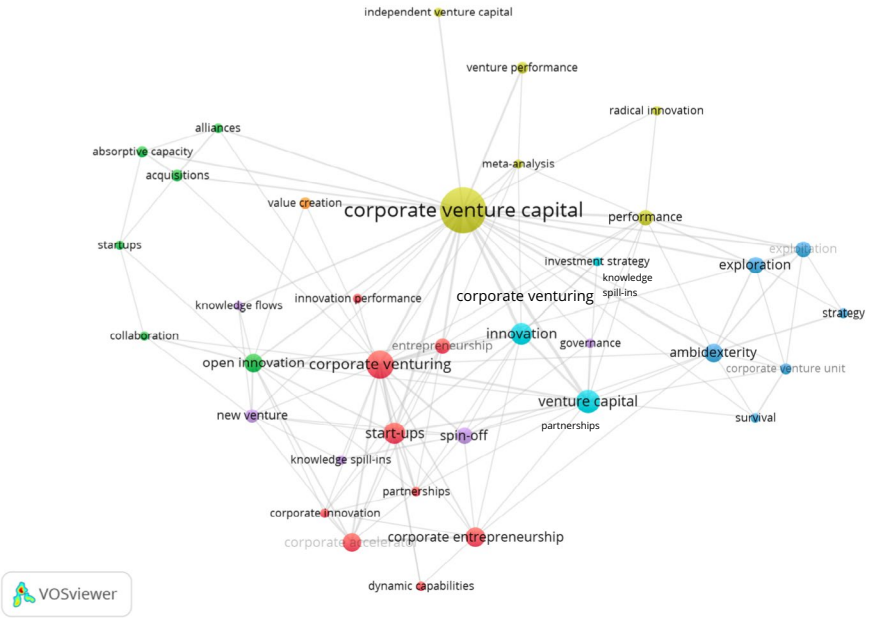

Fig. 6 Co-occurrence analysis based on author's keywords

4.2 Locus of opportunity (origin of venture)

Overall, the CV literature supports the relevance of the first dimension. 42 out of 100 papers differentiate between an external and internal locus of opportunity within the mentioned synonyms from Gutmann (2018). This concept was initially introduced by Hill and Birkinshaw (2008) and describes "whether new venture ideas lie inside or outside the formal boundaries of the firm". Our analysis shows that the interpretation of internal and external activities varies across the CV modes and literature streams. By some authors, the terms are assigned to the origin of the venture, e.g. (Thornhill and Amit 2001; Miles and Covin 2002; Hill and Birkinshaw 2008; Johnson 2012) or technology (Becker and Gassmann 2006), while others view it as a governance form regarding the existence of separate entities and external partners, e.g. (Keil 2000; Schildt et al. 2005; Hussinger et al. 2018). Therefore, in contrast to Gutmann (2018), we suggest including both dimensions, as they describe different phenomena and help explain differences between CV modes more precisely, reducing ambiguity across studies.

In the CV literature, some scholars use the distinction between internal and external CV as a dimension to define their scope, focusing on external or internal CV modes. Internal CV is typically described by ventures that originated inside the corporation, e.g. (Hill and Birkinshaw 2008; Johnson 2012). However, others also define CV generally as an activity that originates internally, e.g. (Thornhill and Amit 2001; Burgers et al. 2009; Waldkirch et al. 2021). Based on the internal origin, ventures can include internal corporate ventures that stay structurally within the

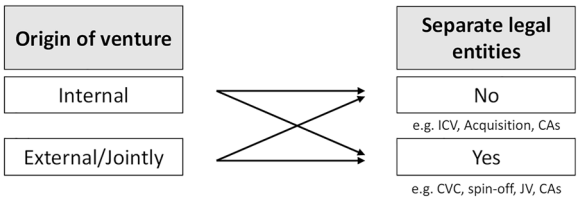

Fig. 7 Distinction of origination of ventures and existence of separate legal entities

corporation or become spin-offs by creating separate legal entities (Thornhill and Amit 2001; Hill and Birkinshaw 2008; Johnson 2012; Hussinger et al. 2018). Conversely, acquisitions represent the opposite transformational arrangement of spin-offs (Keil 2000) and can be described as a process of internalization. The existence of separate legal entities describes the dynamics of CV activities in terms of structural characteristics (Michl et al. 2012) and, therefore, must be considered (Fig. 7).

The literature focusing exclusively on external CV is typically based on the external origination of ventures (Schildt et al. 2005; Enkel and Sagmeister 2020). The most common modes for external CV are CVC, strategic alliances, and acquisitions (Schildt et al. 2005; Keil et al. 2008; Titus et al. 2017). Joint ventures represent a particular type, as these ventures originate jointly between two or multiple partnering corporations (Covin and Miles 2007) but are typically seen as externally originated (Titus et al. 2017).

For startup programs such as incubators and CAs, the origination varies between modes that focus exclusively on either internal or external ideas and technologies (Becker and Gassmann 2006; Weiblen and Chesbrough 2015) or some that are open to both internal and external ideas (Kanbach and Stubner 2016; Veit et al. 2021). Furthermore, these programs also draw similarities to JV, primarily in very early stages, sometimes before its formation (Pauwels et al. 2016), and thus originate based on the program's initiative.

4.3 Prioritization of objectives (primary objectives)

From our sample, 51 out of 100 papers referred to the objectives of CV activities, which confirms Gutmann's (2018) differentiation between primarily strategic objectives, financial objectives, and a balanced type between both. As financial objectives are typically associated with the return on investment (Ernst et al. 2005), it is a characterization that in older research focuses primarily on CVC. However, latest research shows, that many CVCs nowadays position themselves hybrid in terms of motivation because strategic and financial motives are often interlinked (Szalavetz and Sauvage 2023). In contrast, other CV modes are barely (e.g., spin-offs or CAs) or never (e.g., acquisitions and strategic alliances) associated with financial objectives because they are inherently strategic (Keil 2000; Hill and Birkinshaw 2014; Shankar and Shepherd 2019; Enkel and Sagmeister 2020; Huang and Madhavan 2021). Besides creating strategic relationships, the strategic objectives of CV

include the creation of a window on technologies, that is, "a strategy to gain awareness-of and learn-about innovative ventures and the new technologies they developed" (Dushnitsky and Yu 2022), and creating "breakthrough technology for the corporation" (Hill and Birkinshaw 2014).

Across the studies, the CV objectives are considered from different perspectives, including the parent corporation's CV strategy across multiple units and modes (Enkel and Sagmeister 2020; Shuwaikh et al. 2022b, 2022a), the objectives of specific CV units (Siegel et al. 1988), as well as objectives of single investments (Gonzales and Ohara 2019).

The empirical research determines specific objectives either through interviews (Siegel et al. 1988; Hill and Birkinshaw 2008; Kanbach and Stubner 2016; Szalavetz and Sauvage 2023), by the existence of strategic relationships (Kang et al. 2021), or by CV outcomes, including patents for strategic objectives or the return on investment (ROI) for financial objectives (Dushnitsky and Lenox 2005; Huang and Madhavan 2021). Also, the relationship between strategic objectives and different CV modes and governance forms within a single mode has been discussed in detail. Although patterns between objectives and specific investment practices are evident, such as CV units that prioritize financial objectives should receive more autonomy from the parent (Hill and Birkinshaw 2008; Souitaris and Zerbinati 2014; Kanbach and Stubner 2016; Kohut et al. 2021), dimensions and external factors are too complex, to determine investment practices solely based on objectives (Souitaris and Zerbinati 2014).

4.4 Ambidexterity (strategic logic)

In our analysis, 29 studies contain valuable information regarding the distinction between exploration and exploitation, confirming Gutmann's (2018) dimension of 'ambidexterity' for characterizing CV.

Initially, the differentiation between exploration and exploitation comes from March (1991), who associates in the organizational learning literature the term exploration with *"terms such as search, variation, risk taking, experimentation, play, flexibility, discovery and innovation"* and exploitation with *"refinement, choice, production, efficiency, selection, implementation and execution"* (March 1991). In the CV literature, Hill and Birkinshaw (2008) are the first to apply the distinction as so-called "strategic logic", which defines CV units with a focus on either "exploring to develop new assets and capabilities" for the corporation or "exploiting the existing assets and capabilities" of the corporation. Although this view of exploration and exploitation was primarily believed to be a trade-off, the literature subsequently moved toward an ambidextrous perspective (Michl et al. 2012; Hill and Birkinshaw 2014). The capability of corporations to achieve ambidexterity through CV is divided into three approaches. First, corporations can pursue exploration and exploitation simultaneously in the proper relational context, defined by the relationships with internal and external key resource holders (Hill and Birkinshaw 2014; Rossi et al. 2021). Second, CV units can be structurally separated, aiming individually for exploration and exploitation, thus achieving ambidexterity (Shuwaikh et al.

2022a). Finally, CV units can achieve ambidexterity across periods by first exploring or exploiting and subsequently pursuing the complement (Shuwaikh et al. 2022a).

Overall, the empirical results suggest that CV units that maximize exploration and exploitation have a higher chance of sustaining their operations (Hill and Birkinshaw 2014) and achieving superior financial performance for the corporation (Shuwaikh et al. 2022a). In addition, ambidexterity in conjunction with strategic agility affects the competitive advantage of firms, favoring a combination of strategic agility together with an exploration stratgey (Clauss et al. 2021). Across different organizational levels, namely team and department levels, Schnellbächer et al. (2019) argue that individual ambidexterity, defined as an ambidextrous behavior at an employee level, shows positive performance effects.

Although the interpretation of exploration and exploitation as 'strategic logic' has been adopted by many scholars in the CV literature (Michl et al. 2012; Hill and Birkinshaw 2014; Kanbach and Stubner 2016; Rossi et al. 2021; Enkel and Sagmeister 2020; Veit et al. 2021; Urbaniec and Żur 2021; Kohut et al. 2021), there still exists a great variety of definitions and applications in empirical research of the distinction between exploration and exploitation. We found a second concept of ambidexterity that is typically described in the CV literature, which is inherently different but may complement the concept of "strategic logic" (Kohut et al. 2021). Because Hill and Birkinshaw (2008) primarily viewed ambidexterity as a meta-level strategic objective, the concept applies to the corporation's orientation towards exploring new or exploiting existing opportunities. Still, it is not defined as a specific set of activities. In contrast, the second literature stream focuses solely on the learning perspective of CV and its outcomes (Schildt et al. 2005; Williams and Lee 2009; Wadhwa and Basu 2013; Titus et al. 2017; Lee et al. 2018; Shuwaikh et al. 2022a). In this case, exploration is associated with a distant search, learning outcomes that are entirely new and unfamiliar to the corporation and rather lead to radical than incremental innovation, while exploitation is associated with a local search, learning outcomes that are related and familiar to the corporation's existing knowledge and rather lead incremental than radical innovation (Schildt et al. 2005; Wadhwa and Basu 2013; Lee et al. 2018). Thus, exploration and exploitation are interpreted as "poles on a single continuum" (Hill and Birkinshaw 2014). This concept extends the "strategic logic" by distinguishing exploratory activities (see Fig. 8) that develop

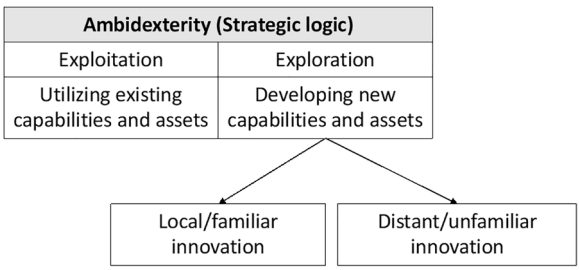

Fig. 8 Exploration and exploitation in the corporate venturing literature

new capabilities into innovations that are either local or distant to the corporation (Schildt et al. 2005; Kohut et al. 2021).

CV literature inevitably recognizes these two interpretations for further research to avoid confounding them and create comprehensible results. This ambiguity seems to be a common problem in the ambidexterity literature due to the imprecise nature of the concept, as previously recognized by (O'Reilly and Tushman 2013).

Therefore, we propose to introduce different terminologies to avoid further misunderstandings. According to March's (1991) original interpretation, exploration is associated with search and innovation, while exploitation is associated with execution and refinement. This corresponds primarily to Hill and Birkinshaw (2008) concept of a 'strategic logic', whereas the innovation performance primarily resembles exploration. Therefore, learning strategies and outcomes could be radical and incremental innovations (Kohut et al. 2021). For analyzing explorative activities specifically, including learning strategies and outcomes of innovation, most authors differentiate between a local search or outcome and a distant search or outcome of innovation. On the other hand, this should not be confounded with the terminology of exploration and exploitation but is best characterized by the degree of familiarity or distance the corporation has with the innovation at hand (Kohut et al. 2021).

4.5 Link to the corporate firm

Gutmann (2018) finds ambiguity in scholars' descriptions of the "link to the corporate firm" dimension in the most recent review. The associations Gutmann (2018) made to this dimension are the operational linkages between corporations and ventures, the structure between the corporation and CV units, and the extent of innovation and relatedness. However, the final dimension is only characterized by "loose and tight links", referring to the operational relationship between corporations and ventures (Gutmann 2018). In our sample, 63 of 100 papers specify the characteristic linkages between the corporation and the venture. The quantity is proportionate, as this topic covers the nature of CV activities being inter-organizational relationships. The associations of this dimension to the extent of innovation and relatedness are discussed primarily in other dimensions. They will be further evaluated in Chapter 4.12, where all dimensions are harmonized.

The dimension of linkages between corporations and ventures is generally distinguished in the CV literature between two main concepts, namely the operational and strategic autonomy of ventures from the parent corporation.

Operational autonomy defines ventures' integration level and dependencies towards the corporation (Burgers et al. 2009; Johnson 2012; Garrett and Covin 2015; Waldkirch et al. 2021). The dimension can be described by multiple factors, including financial support through funding (Pauwels et al. 2016; Wang et al. 2021), and non-financial support through formal and informal linkages of operations (Burgers et al. 2009; Johnson 2012), employee mobility (Kim and Steensma 2017; Cirillo 2019), mentoring, networking, and facility services (Sorrentino and Williams 1995; Kanbach and Stubner 2016; Shankar and Shepherd 2019), which enable synergies

between the corporation and the venture (Haslanger et al. 2022). Knowledge flow is also commonly represented either as patenting (Di Lorenzo and van de Vrande 2019) or by strategic alliances, such as licensing or collaborative R&D (Gonzales and Ohara 2019; Kang et al. 2021). The integrational level is also, for acquisitions, an essential factor influencing the innovation outcomes of young ventures (Puranam et al. 2006). Additionally, the mediating role of intermediaries is critical to recognize, which may help or hinder the connection between corporation and venture (Yang 2012). So far, the internal CV literature has contributed the most significant empirical results. Johnson's (2012) analysis shows that the relation of the structural autonomy to the venture performance is moderated by the stage of development, with a U-shaped relationship for early stages, a positive relationship for middle stages, and a negative relationship for established stages. With similar results, Covin et al. (2020) determined the development stage of ventures by its strategic clarity, that is, how clear the strategy and objectives are to the venture management, showing a moderation effect on the influence of operational autonomy. While ventures with low strategic clarity perform better with more operational autonomy, ventures with high strategic clarity perform better with less operational autonomy (Covin et al. 2020).

Strategic autonomy describes the extent to which venture management is responsible for setting objectives and formulating the strategy (Johnson 2012; Garrett and Covin 2015; Waldkirch et al. 2021). Strategic autonomy is based, on the one hand, on the discretion of a corporation, which implies that it can control the venture, and on the other hand, which influence the corporation is taking in the strategic decision-making of ventures (Waldkirch et al. 2021). Especially the ownership structure and board representation are often considered important factors determining strategic autonomy (Yang 2012; Paik and Woo 2017; Hussinger et al. 2018; Wang et al. 2021) besides being considered a source of knowledge transfer for the corporation (Dushnitsky and Lenox 2005; Yang 2012). Thus, the benefits and risks regarding strategic autonomy for startups and corporations must be considered carefully (Maula et al. 2009). For internal CV, Thornhill and Amit's (2001) findings support a positive association of closer ties, reducing the venture's strategic autonomy, with venture success. Also, Johnson (2012) finds a negative impact of strategic autonomy on the venture's performance, independent of the venture's development stage. Regarding early equity investments, Hussinger et al. (2018) provide evidence that a high concentration of shareholders in a venture diminishes the positive effects of corporate investors on the radical innovation outcome. The ownership concentration approximates the venture's strategic autonomy, which increases with the number of shareholders. Furthermore, Park et al. (2019) analyzed the impact of CVC participation on the concentration of shareholders itself. They found that CVC investors in syndicates are associated with a lower concentration of shareholders than those without, giving the startup more control. Regarding the actual ownership of corporate investors, Maula et al. (2009) argue that due to the venture's fear of competing business interests from corporate investors and the sense of misappropriation, ventures use safeguards such as limiting the ownership of corporations to 10%. On the other hand, this safeguard may impede social interactions and reduce the positive effects of corporate participation (Maula et al. 2009). Semadeni and Cannella

(2011) also highlighted the risks of continued ownership in spin-offs, which hinders them from developing as independent entities and ultimately leads to lower market performance. However, they find that modest oversight by the parent company positively affects the venture's market performance. This can be implemented by having a board member or a chairman from the parent on the board of management. Wang et al. (2021) analyze the obtained control rights by a corporation on three different levels, averaging the indicators of the proportion of CVC seats on the board of directors, the board of supervisors, and a place in the management. They find that startups give corporate investors more control rights when they have complementary technologies, and more importantly, the obtained control rights positively affect the innovation outputs of the venture. This mechanism is also supported by Masulis and Nahata (2009), who found that startups accept higher board representation of corporations with complementary assets compared to those that are competitors.

The strategic and operational autonomy of ventures the corporation grants is an essential determinant for the venture's and, ultimately, the corporation's performance (Johnson 2012; Waldkirch et al. 2021). The overall conception of venture autonomy depends on multiple interdependent factors. Thus, Waldkirch et al. (2021) suggest a model that describes three possible configurations representing the venture's autonomy, namely as "controlled subunit", "linked subunit", and "detached subunit". Controlled subunits retain no strategic or operational autonomy, however, they regain autonomy through the protection of the corporation's top management. Linked subunits are operationally autonomous but remain dependent on the corporation, either strategically or financially. Lastly, detached subunits have operational and strategic autonomy.

4.6 Level of (investment) intermediation

The dimension of intermediation in CV was described by Gutmann (2018) solely as a structural dimension for financial investments, typically regarding CVCs, while our in-depth analysis shows a broader and more complex concept. We add to this topic the role of internal relationships and processes (Siegel et al. 1988; Souitaris and Zerbinati 2014), partnerships with external parties (Keil 2000; Balz et al. 2022), and non-financial intermediation (Kanbach and Stubner 2016). In total, 37 papers from our sample relate to intermediation in their work. As mentioned in the previous chapter, "link to the corporate firm", the structural differentiation is moderated by the level of intermediation and is often not separated by some scholars, e.g. (Burgers et al. 2009). However, this distinction is necessary for a fine-grained and accurate analysis (Souitaris and Zerbinati 2014).

The setup structure of CVCs can be divided into direct investments (i.e., the capital is off the balance sheet of the corporation) and indirect investments, including wholly-owned self-managed subsidiaries, dedicated VC funds, which are co-managed by VCs, and third-party funds (Keil 2000; Miles and Covin 2002; Souitaris and Zerbinati 2014; Lee et al. 2018). Although CVC is mainly described as direct and indirect investments (Dushnitsky and Lenox 2005; Lee et al. 2018), some scholars exclusively refer to CVC as an indirect investment, e.g. (Keil 2000; Schildt et al.

2005). It is also evident that indirect investments are not considered a homogeneous group but differentiate between the three abovementioned types with different corporate involvements (Keil 2000). Therefore, in our characterization of this dimension, we consider the existence of setup funds and the operative and decision-making authority of the respective CV activities. The analysis by Souitaris and Zerbinati (2014) also highlights and clarifies that multiple factors are necessary to evaluate the actual investment practices of corporate investors, in which they describe a continuum between an 'arm's length' and 'integrated' investment logic. The eight categories include, among others, the strategic potential and approval from the corporation, the syndication with VCs, referrals from the business units, their involvement in the due diligence process, and the link to the corporation's resources. This concept has been similarly described by Siegel et al. (1988), who referred to investors as 'pilots' or 'co-pilots' and highlighted, besides the approval, the funding structure of CVC units as a significant factor for its autonomy.

For empirical studies, observing the exact investment practices is often a challenge. Thus, surveys can be conducted to consider the investment logic or archival data regarding the setup structures, which is frequently used as a proxy (Souitaris and Zerbinati 2014). Yang et al. (2016) found that wholly-owned subsidiaries are positively associated with the industry diversification of their venture portfolios. Additionally, Lee et al. (2018) also examined the setup structure between direct investments and wholly-owned subsidiaries. They found that the latter positively affects explorative learning outcomes, whereas direct investments are associated with more exploitative learning outcomes. However, as previously elaborated, Lee et al. (2018) also suggest that future research clarifies the actual intermediary role of CV activities, as in structurally separated setups, the corporation may still have more influence, while direct investments can be made with high autonomy.

The established research field of startup programs, such as CAs, shows that intermediation is not only applicable to financial intermediaries (e.g., CVCs) but also to non-financial collaboration models that emphasize the support of the venture regarding "innovation and business development rather than predominantly pursuing financial investments" (Kohler 2016). The management of CAs is typically responsible for the program's processes and acts as a "knowledge intermediary", making resources available to both corporation and startup (Simon et al. 2019). Some researchers even show that there is somehow a mix between financial and non-financial intermediaries, described by Pauwels et al. (2016) as "deal flow maker". In this case, the funding structure typically consists of financial partners such as business angels and CVCs cooperating with non-financial intermediaries to find prosperous investment opportunities. Similar modes are also described by Kanbach and Stubner (2016), Shankar and Shepherd (2019), and Veit et al. (2021).

The characterization of the intermediary role of CA is typically described by the structural setup and the existence of partnerships with external parties (Kohler 2016; Pauwels et al. 2016; Kanbach and Stubner 2016; Nesner et al. 2020). Structurally, CAs can be differentiated as internal, in which they might be part of an existing business unit or create a new one (Nesner et al. 2020), or they exist as a separate legal entity (Kanbach and Stubner 2016; Nesner et al. 2020). External partners further determine the role of intermediation (Kanbach and Stubner 2016; Nesner et al.

2020), which corporations may utilize to gain experience before investing in their business units and, thus, evolve (Kohler 2016).

4.7 Equity involvement

The topic described by Gutmann (2018) revolves around the discussion of whether the parent takes equity from the venture or not. Thus, the characteristic of equity involvement seems to be primarily a dual variable. However, we find that the literature extensively discusses the extent of involvement regarding the corporation's ownership share within one mode (Maula et al. 2009; Semadeni and Cannella 2011; Paik and Woo 2017; Kanbach and Stubner 2016) or between different modes, such as CVC, joint venture and acquisitions (Roberts and Berry 1985; Weiblen and Chesbrough 2015; Titus et al. 2017; Kang et al. 2021). While CVC is by definition primarily an equity investment (Dushnitsky and Lenox 2005) and is frequently compared to independent VCs (Guo et al. 2015; Shuwaikh et al. 2022b; Xiao et al. 2023), the objectives of corporate investors can vary to a great extent, which ultimately affects the financial investment (Gonzales and Ohara 2019; Rossi et al. 2020b; Kang et al. 2021). Therefore, an important aspect to debate is the objectives and performance of equity investments (Haslanger et al. 2022; Pauwels et al. 2016; Schildt et al. 2005; Shankar and Shepherd 2019). Finally, other modes of collaboration models focus primarily on non-financial collaborations, and equity, if at all, plays a secondary role (Weiblen and Chesbrough 2015; Veit et al. 2021).

There is a general conception of CV modes that they fall either in the category of equity or non-equity collaborations (Weiblen and Chesbrough 2015; Titus et al. 2017). Equity investments are typically referred to as CVC (direct and indirect), joint ventures, and acquisitions (Titus et al. 2017). In contrast, non-equity collaboration includes "licensing, strategic buyer–supplier relationships as well as research and development (R&D) collaborations" (Simon et al. 2019). However, the governance form between startups and corporations is usually not permanent (Schildt et al. 2005; Enkel and Sagmeister 2020) and not necessarily limited to one form of collaboration (Kanbach and Stubner 2016; Gonzales and Ohara 2019; Kang et al. 2021).

Roberts and Berry (1985) established that CV activities differ in their involvement level with ventures. While venture capital is seen as a more disintegrated mode due to its minority equity investment, corporate involvement increases for joint ventures, where corporations share the ownership with only a few partners. It is the highest for acquisitions, where corporations take a majority equity stake in a venture. This characterization is consistent with the literature and often refers to external CV mode studies (Schildt et al. 2005; Keil et al. 2008; Titus et al. 2017; Enkel and Sagmeister 2020). The real options perspective of CVC also emphasizes the variation of equity positions, which views CVC investments as low-risk engagements that follow a wait-and-see strategy to later either fully commit through an acquisition, create non-equity collaborations, or exit (Kang et al. 2021; Shuwaikh et al. 2022b).

In addition, while most research on CVC investments generalizes this mode as minority equity investments and doesn't categorize the equity share more precisely (Dushnitsky and Lenox 2005; Haslanger et al. 2022), others highlight significant

differences in equity variations within this CV mode. Maula et al. (2009) describe for CVC investments, the ownership of more than 10% of a venture as a threshold that increases for ventures the perceived risk of misappropriation, losing autonomy, and slowing down its development. In Semadeni and Cannella's (2011) study of spin-offs, the ownership variable was expressed as a percentage that went up to 20%, but overall, with only 8% of corporations taking equity at all. The results from Semadeni and Cannella (2011) show that continued ownership by the corporation, and thus its control, hurt the venture's market performance and, therefore, the shareholder's return. Paik and Woo (2017) analyzed the effects of ownership on the venture, which shows that for every 1% increase of ownership by CVCs, the R&D spending of the venture rises almost to the same extent. These results further stress the strategic importance of equity investments, as substantial ownership influences the venture's strategy (Paik and Woo 2017).

Regarding collaboration programs such as CAs or incubators, the role of equity is also a highly discussed topic. If the corporation takes equity, it typically ranges between 5 and 10% in return for pre-seed funding (Pauwels et al. 2016). Whether and how often a program takes equity from ventures depends on the corporation's objectives, which may be primarily strategic or financial (Kohler 2016; Shankar and Shepherd 2019). Some programs don't take equity, some take it optional, and others take it obligatory (Kanbach and Stubner 2016). On the one hand, an equity position is perceived as a financial instrument to generate returns in the long run, while it also provides corporations the opportunity to continue the collaboration after the program as a CVC and monitor the technology's development (Pauwels et al. 2016; Shankar and Shepherd 2019).

4.8 Direction of innovation flow

In our literature review, the direction of innovation flow is considered relatively less than other dimensions. This could be because innovation flow is part of the research stream of open innovation (Hill and Birkinshaw 2008), whereas our search string and we focus more on corporate venturing. Researchers who have recognized the open innovation research stream in their analysis (Gassmann and Becker 2006; Hill and Birkinshaw 2008) mainly adapted the characteristic of "locus of opportunity" characteristic, making the direction of innovation flow redundant.

Only fife studies contain valuable information about the direction of innovation flow. In contrast, others sometimes refer to external CV modes in general as 'open innovation' tools (Kurpjuweit and Wagner 2020), using a different terminology like "knowledge spillovers" (Paik and Woo 2017) or refer to "learning outcomes" (Lee et al. 2018). However, these are not included for this dimension because they do not use the concept of "open innovation" in their analysis and are more accurately discussed by other dimensions, including "strategic objectives", "link to the corporation", and "ambidexterity".

The origin of this dimension is based on Weiblen and Chesbrough (2015), who developed a typology for collaboration models that include corporate investments,

start-up programs, and incubation, describing inside-out and outside-in innovation flow. This view has been extended by Kohut et al. (2021), who adapted the typology of (Hill and Birkinshaw 2008) but renamed the types according to the open innovation terminology. Therefore, the strategic logic changes from 'explorer' to 'in' and from 'exploiter' to out, which makes it compatible with the terminology of open innovation (Weiblen and Chesbrough 2015) and ultimately adds two more concepts, namely the inside-in (internal explorer) and outside-out (external exploiter) innovation flow.

The latest, most recent discourse regarding the extension of open innovation that focuses on the knowledge flows from corporate venture capital investments was written bei Gutmann et al. (2023). The paper primarily identifies and exampines inside-in (overcoming internal silos to archive real innovation impact) and outside-out (help shape the ecosystem for corporate innoavtors) knowledge flows. This publication would be a valid argument that it could be discussed to rename the dimension from 'innovation flow' to 'knowledge flow'. However, we do not define this dimension further due to the lack of adaptations in corporate venturing literature and the parallels to other dimensions.

4.9 Relatedness

Relatedness is a new dimension not looked at separately by Gutmann (2018). It was observed in 42 out of 100 studies and describes the similarity of the CV partner's business activities, which includes the overlap of their industry and technology knowledge (Roberts and Berry 1985; Gassmann and Becker 2006). Both concepts are likely to be correlated. Still, companies operating in a given industry typically have technologies across multiple domains, while technologies can be equally adapted across various industries (Yang et al. 2016). Moreover, we find that relatedness is best described at four different levels, namely as an antecedent of CV modes (Roberts and Berry 1985), including a focused or broad search scope (Yang et al. 2016; Kanbach and Stubner 2016), as a moderator of CV activities (Keil et al. 2008), and their respective outcomes (Schildt et al. 2005).

The relevance of this topic emerged very early in the CV literature, in 1985, when Roberts and Berry (1985) conceptualized adequate entry strategies for CV modes based on the technology and the market's level of newness and familiarity for the corporation. Since then, many associations have been made by researchers that refer to relatedness, including synonyms and manifestations such as familiarity (Garrett and Covin 2015), complementarity (Maula et al. 2009; Veer et al. 2022), substitutes/competition (Ernst et al. 2005), intra-industry (Keil et al. 2008), unrelatedness (Schildt et al. 2005), broad/specific industry focus (Kanbach and Stubner 2016), core/non-core technology (Gassmann and Becker 2006), technological distance/proximity (Ceccagnoli et al. 2018; Dushnitsky and Lenox 2005), newness (Roberts and Berry 1985), industry overlap (Sears et al. 2022) or technological overlap (Bae and Lee 2021).

Roberts and Berry (1985) conceptual framework proposed that for CV activities in related areas to the current business, any CV mode is viable. Still, internal

ventures or acquisitions are the most appropriate. For unrelated businesses, strategies with a lower commitment, such as minority investments or licensing, are ideal. This is empirically supported by Ceccagnoli et al. (2018), who used real option theory to underline the benefits and complementarities that CVC can realize as a "wait-and-see strategy" (Ceccagnoli et al. 2018). Their results show that when partners of corporations operate in different technological areas, the likelihood of choosing CVC relative to licensing, R&D alliances, and acquisitions increases significantly. This view has been questioned by Titus et al. (2017), who argue that acquisitions are used more frequently by corporations seeking more disruptive innovation. In unrelated technological areas, Cirillo (2019) finds that spin-offs supported by their parent corporation are a suitable approach to reduce information asymmetries, which positively affects patent quality compared to CVCs or alliances. Furthermore, technological proximity only increases the likelihood of CVCs and startups forming a relationship to a certain extent as long as the knowledge bases do not overlap (Ma 2020). A high level of technological overlap between a spin-off and its parent firm even deters potential corporate investors from making an investment in the spin-off, fearing tensions and anticipated hostile actions by the parent firm (Bae and Lee 2021). In this regard, Dushnitsky and Shaver (2009) and Sears et al. (2022) also highlight the fear of misappropriation from startups operating in related industries, which reduces their interest in disclosing information and collaborating with CVCs. This concept is also known as the 'paradox of corporate venture capital', as relationships of related partners are thought to be the most beneficial (Dushnitsky and Shaver 2009).

Keil et al. (2008) analyzed the moderating role of the level of industry relatedness—differentiating intra-industry, related, and unrelated—on the relationship between several external CV modes, including CVC, JV, alliances, and acquisitions, and their innovation output. The results show that alliances, joint ventures, and CVC are associated with a higher innovation output in related industries, whereas acquisitions benefit intra-industry investments (Keil et al. 2008). These findings further support the entry strategies suggested by Roberts and Berry (1985).

In addition, relatedness is a measure between corporations and ventures and can also be determined within the venture portfolio of CV units such as CVCs or CAs. Yang et al. (2016) use measures regarding industry and technologies similar to those of prior studies (Schildt et al. 2005). Yang et al. (2016) find that structurally separated CVC units are positively associated with portfolio diversification, but only for industry and not technology diversification. CAs are also often characterized in terms of whether they have a narrow focus on specific industries and technologies, with different degrees of relatedness (Kanbach and Stubner 2016; Veit et al. 2021), which enables them to contribute their expertise (Kohler 2016) and build sector-specific knowledge to better evaluate financial investments (Pauwels et al. 2016), while others have instead a broad scope and focus primarily on the prosperity of startups (Kanbach and Stubner 2016; Shankar and Shepherd 2019; Veit et al. 2021).

Another essential aspect often associated with relatedness is the degree of innovation, which, unlike the antecedents discussed earlier, describes the specific outcomes of CV (Ma 2020). The degree of innovation outcome is typically described as a continuum between incremental and radical innovations (Hussinger et al. 2018;

Kohut et al. 2021), while some scholars also use the terms explorative and exploitative innovation as synonyms (Schildt et al. 2005; Puranam et al. 2006; Wadhwa and Basu 2013; Ma 2020).

Schildt et al. (2005) analysis yields multiple exciting results. First, they find that industry-relatedness has no relationship with the degree of learning outcomes. Thus, corporations may create radical (explorative) learning outcomes in related industries and incremental (exploitative) learning outcomes in unrelated industries. However, they find that technological relatedness and downstream vertical relatedness decrease the likelihood of radical (explorative) innovations and increase incremental (exploitative) innovations. Regarding the CV modes itself, Schildt et al. (2005) findings also show that JV and alliances are positively associated with creating radical (explorative) innovations, whereas acquisitions are more used for incremental (exploitative) innovations. In contrast to Keil et al. (2008), the results from Schildt et al. (2005) for CVC show that this mode is unlikely to produce new patents based on the collaboration, which may be due to its missing linkages to the corporation's research departments, or their focus is primarily on monitoring (Schildt et al. 2005; Enkel and Sagmeister 2020). Lee et al. (2018) analyzed the outcomes of CVC similarly to Schildt et al. (2005). However, they did not measure the citations to their partners, similar to Keil et al. (2008), and determine the innovation outcome based on whether patents are applied to technology classes known by the corporation (incremental, exploitative) or they are entirely new (radical, explorative). They found that direct investments are more likely to produce incremental innovations, while separate CVCs are more likely to have radical innovation. Also, the participation of corporate investors and the ownership concentration of startups influence incremental and radical innovation outcomes (Hussinger et al. 2018). Although corporate investors can have a positive impact on generating radical innovation, they must reduce their control. This can be implemented by keeping startups strategically autonomous through low ownership concentration (Hussinger et al. 2018) or avoiding restrictions on the startup's operational autonomy (Puranam et al. 2006).

4.10 Time horizon

This dimension was referred to in 20 publications and is a newly defined dimension compared to Gutmann (2018). Time horizon is significant for practitioners planning new business development. The role of time horizon is commonly discussed across different topics, including program duration (Weiblen and Chesbrough 2015; Kurpjuweit and Wagner 2020), expectations on the return on investment (Shankar and Shepherd 2019; Hill and Birkinshaw 2008), the actual performance (Huang and Madhavan 2021) and the evolvement of CV modes with one specific startup (Enkel and Sagmeister 2020; Roberts and Berry 1985).

The time horizon directly influences the mode considered for discrete CV activities. This is why Weiblen and Chesbrough (2015) recognized the "time horizon of involvement" (p. 82) as a significant characteristic describing four external modes of CV. While CVC and corporate incubation were both defined as long-term, startup programs are either short-term, when they focus on product innovation, or mid-term,

aiming to establish a platform. More specifically, Kohler (2016) mentions that the program duration of accelerators is usually shorter than that of incubators. However, after ending an intense collaboration within the program, the CA can continue its relationships with its alumni. Nesner et al. (2020) structure this process as a pre-acceleration, acceleration, and post-acceleration phase in which corporations interact with startups. The acceleration phase typically lasts 3–6 months (Pauwels et al. 2016; Kohler 2016). However, some cases are described between 1–12 months (Veit et al. 2021). Yet, startup supplier programs are another form of collaboration model that was differentiated from accelerators (Kurpjuweit and Wagner 2020). While CA typically has a fixed duration, the startup supplier programs Kurpjuweit and Wagner (2020) identified are flexible, ranging from 1 to 6 months.

An additional concept addressed in various studies is the time horizon as a variable regarding the return on investment (Shankar and Shepherd 2019; Huang and Madhavan 2021). Similar to the duration of programs, Shankar and Shepherd (2019) distinguish CAs that either expect short- to medium-term or long-term returns, which represents an important selection criterion for startups. The prior was measured by the number of "vendors, partners, ideas, and POCs sourced in short-term" (p. 7), whereas the latter measures the startup's valuation, the number of acquisitions, and learning benefits. Similar in the context of general CV units, Hill and Birkinshaw (2008) identified the strategic objective of those to be either explorative-orientated or exploitative-orientated, which typically operate on a long- and short-to-medium time horizon. Additionally, both activities can be viewed as complementary by changing the strategic logic across periods (Shuwaikh et al. 2022a). Here, it can be seen that the dimension time horizon also intersects with Sect. 4.4, ambidexterity.

Another critical factor apart from the investment duration is the longevity of CV programs overall. While the survival of the CV unit is a necessary condition for long-term success, it reflects not only internal success within the unit but also alignment with the overall CV strategy of the organization and provides an objective measure of the CV unit's performance (Hill et al. 2008). While Hill et al. (2008) found that the unit's performance positively mediates its survival, it is by no means a guarantee. Hill and Birkinshaw (2014) argue that an ambidextrous approach to exploration and exploitation is vital for the CV unit's survival. More recently, Ma (2020) stated that CVCs are motivated by the corporation's need to address internal innovation weaknesses and are, therefore, terminated when these weaknesses recover.

Although CVC investments are often referred to as a long-term-oriented tool (Ceccagnoli et al. 2018), the empirical research on the benefits regarding their performance is not completely clear. A current meta-analysis from Huang and Madhavan (2021) compared therefore the results of multiple studies regarding short- and long-term financial outcomes of CVC investments. Although they are positively associated with both, the value of long-term financial outcomes for the parent is minimal. It, therefore, lacks substance in comparison to the direct short-term effects. This may result from the corporation's long-term strategic objective to acquire startups (Ceccagnoli et al. 2018). Guo et al. (2015) showed that CVC investors are associated with longer investment durations of startups than independent VCs,

negatively affecting the probability of an IPO exit. This is also supported by Ceccagnoli et al. (2018) results regarding CVC as a real option, which describe the value of its investment partly due to the time duration in which the corporate will learn and acquire knowledge that will then lead to reduced risks and eventually a non-financial collaboration between the startup and corporation. Shuwaikh et al. (2022b) also support Guo et al. (2015) study, showing that in the US, ventures financed by CVCs have a longer duration of receiving investments, around 40% than independent investors, and in the UK of, 25%. This is explained by the CVC's motivation to benefit from organizational learning and the reluctance to aim at a "fast investment recovery" (Shuwaikh et al. 2022b).

Finally, the importance of time horizon has also been analyzed from the position of startups, where collaborations with corporations are beneficial in the short-term through the corporation's financial support, access to their facilities, specialized equipment, knowledge, and validation of the technology (proof of concept), while in the long-term, start-ups also benefit from learning, visibility and branding by the company, expanding its network and becoming suppliers (Corvello et al. 2021). However, startups are also aware of the corporation's focus on short-term performance and, therefore, may fear misappropriation (Corvello et al. 2021; Sears et al. 2022). This perception of risk on the part of start-ups can be mitigated by CVC investors' previous investment continuity (Sears et al. 2022).

4.11 Development stage

The last and new dimension is called the development stage of start-ups, referred to in 30 out of 100 studies. The interpretation and definition of different startup stages are either based on general milestones such as financing rounds (Rossi et al. 2020b; Balz et al. 2022) and business activities (Thornhill and Amit 2001) or on more fine-grained classifications like strategic clarity (Covin et al. 2020) or the first launch of a product within earlier stages (Puranam et al. 2006) (Table 2).

From our sample of studies, the characterization based on the financing round was only found in CVC literature. Balz et al. (2022) identified the series A financing round as critical in the context of CVC-IVC value-creation for startups. If the startup is in a prior stage, referred to as the "pre-revenue seed stage" (Balz et al. 2022), the corporate can potentially support the venture with its product-market fit. However, the risks of unequal power distribution could also be harmful. In later stages, past the series A financing round, corporations can contribute to the venture's scale-up phase and increase the likelihood of trade sales. Investments received in later stages

Table 2 Classifications of three development stages of ventures

Classification	Early-stage	Middle-stage	Late-stage
Financing round	Pre-seed/seed round	Round A/B	Later rounds
Growth model	First year of investment	First year of revenue	First year of profits
Add. characteristics	Strategic clarity; first product launched		

increase venture revenue but decrease venture R&D intensity (Di Lorenzo and Sabel 2023). Kang et al. Kang et al. (2021) also focus on financing rounds. However, they classify Series A and B as early stages and subsequent rounds as later stages. Hence, Kang et al. (2021) developed their variable "early-stage investment" as a ratio between the number of investments in the early stages divided by the total number of investments. The results show that early-stage investments decrease the positive correlation between technology spillovers and capital gains. Similarly, Rossi et al. (2021) argue that CVCs investing in later financing rounds are likelier to have strategic objectives and follow an ambidextrous strategy. They differentiate four separate development stages by financing rounds of startups, namely (1) seed and early investments, (2) round A, (3) round B, and (4) other rounds (from C to F).

For CA, the role of the startup's development stage is also a highly cited characteristic. For very early-stage startups, the CAs' provision of mentoring and education services is crucial to refining "their concept, business model, and market offerings" (Kohler 2016, p. 353). This is also supported by Moschner et al. (2019), who describe the primary activity of one CA mode as developing early-stage ventures so that they can survive. Furthermore, depending on the venture's stage, taking equity may be harmful in the early stages, or the funding amount might not be attractive enough for later stages (Kohler 2016). Pauwels et al. (2016) based their selection criteria for their three modes of CA also on the venture stage. While the "ecosystem builder" and "deal flow maker" prefer later-stage startups with "some proven track record", the "welfare stimulator" aims at very early-stage ventures (Pauwels et al. 2016). The differentiation between early- and later-stage ventures for CA has been consistent, however, a clear definition for differentiating the types is missing. Kanbach and Stubner (2016) associate the early stages with startups in the idea or prototype stage, which may not be founded yet. In contrast, later-stage startups have developed products and customers and have already generated revenues. Their case studies show that some modes prefer startups from certain stages, while others are indifferent (Kanbach and Stubner 2016). In contrast to the research of CAs, Kurpjuweit and Wagner (2020) differentiate CA from startup supplier programs, which have been identified as a mode that focuses on rather mid-to later-stage startups, while CAs tend to collaborate with early-stage startups.

Another method used to define the venture's stage of development was conducted by Johnson (2012) following Thornhill and Amit (2001). It represents the early stage as the first year a venture receives financial investment, the middle stage as it generates revenue, and the established stages as it becomes profitable. The development stage was found to moderate the effect of structural autonomy on venture performance. However, it was insignificant for the relationship between planning autonomy and performance (Johnson 2012). The association of structural autonomy and venture performance was positive for the middle stage and harmful for the established stages and early stages, in which Johnson (2012) found an inverted U shape. In this case, "optimization becomes the key" (Johnson 2012) as the venture will likely fail with either too many operational linkages to the parent or too few.

Finally, some scholars also use other criteria to characterize development differences between startups that are especially suitable in the early stages. Covin et al. (2020) differentiated the development of early-stage ventures by determining the

extent of clarity regarding the "mission, objectives, and intended value proposition" (p. 2) for the venture's management. The results show that for high strategic clarity, the learning proficiency is higher when the internal operations are designed and controlled by the parent, whereas for low strategic clarity, the learning proficiency is more significant, with more autonomy for the venture management. Regarding acquisitions, Puranam et al. (2006) identified the launch of the first product of a venture as a significant characteristic. It indicates the venture's focus of development that is either explorative or exploitative. Puranam et al. (2006) find that corporations should give acquired ventures more autonomy if they are still in an explorative development phase, which applies to those that haven't launched products yet.

4.12 Harmonizing dimensions

As mentioned above, many of the dimensions in the previous chapters interplay with each other and cannot be looked at independently. To understand the degree of affiliation between the different dimensions, we tried to work out different higher-level categories. We arranged our dimensions in these higher-level categories so that the resulting framework (Fig. 9) harmonizes all our dimensions and their characteristics and should help practitioners in their decision-making process.

The harmonization of the established dimensions from the CV literature can be categorized as a threefold division, representing the different levels of decision-making and relevance. However, it is still highly interrelated (Hill and Birkinshaw 2008).

On the highest level, we organize the dimension of the CV activity's primary objectives and ambidexterity (strategic logic). The primary objectives of CV can be either financial, strategic, or a balance of both, e.g. (Weber and Weber 2005; Hill and Birkinshaw 2008; Kanbach and Stubner 2016; Rossi et al. 2021). This characterization is especially suitable for CVC (Weber and Weber 2005), startup programs (Kanbach and Stubner 2016; Shankar and Shepherd 2019), and spin-offs (Parhankangas and Arenius 2003; Hill and Birkinshaw 2008). Alliances, joint ventures, and acquisitions are always primarily associated with strategic investments and only

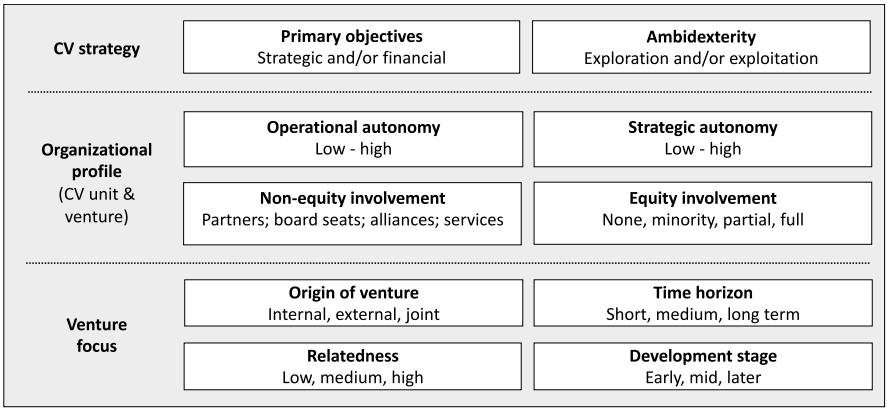

Fig. 9 Framework for the harmonization of CV dimensions

apply to the strategic objective (Keil 2000; Titus et al. 2017; Huang and Madhavan 2021).

With a high similarity, the dimension of ambidexterity is included as so-called strategic logic, e.g. (Hill and Birkinshaw 2008, 2014; Kanbach and Stubner 2016; Veit et al. 2021; Kohut et al. 2021) or business model logic (Urbaniec and Żur 2021), which describes the strategic agenda of CV and helps the corporation to implement CV most effectively (Hill and Birkinshaw 2008; Enkel and Sagmeister 2020). The main characteristics are whether a CV activity pursues exploration, which means developing new capabilities that are often associated with monitoring and learning in general (Dushnitsky and Lenox 2005; Enkel and Sagmeister 2020; Urbaniec and Żur 2021), or exploitation, which describes the utilization of existing capabilities (Hill and Birkinshaw 2008; Williams and Lee 2009; Urbaniec and Żur 2021). The differentiation of achieving those two distinct capabilities is referred to as ambidexterity, which is either attained through the structural separation of CV units, setting up the proper context, or sequentially over multiple periods (Hill and Birkinshaw 2014; Rossi et al. 2021; Shuwaikh et al. 2022a). Thus, ambidexterity can be achieved in corporations within a single CV mode or across multiple complementary modes (Michl et al. 2012; Enkel and Sagmeister 2020). Furthermore, the dimension of ambidexterity is also often referred to as innovation outcomes, which is different from the capability perspective, e.g. (Schildt et al. 2005; Lee et al. 2018) and is better explained by the differentiation of incremental and radical innovation outcomes (Michl et al. 2012; Kohut et al. 2021) or the degree of familiarity to the corporation (Wadhwa and Basu 2013; Cirillo 2019).

Second, we categorize all dimensions describing the organizational form of CV activities. This includes the structural condition of CV units and ventures, whether they exist as separate legal entities or are part of the corporation. For CV units, this can be considered for CVCs, CAs, incubators, or even M&A units (Michl et al. 2012; Yang et al. 2016), which are typically interpreted as intermediaries (Miles and Covin 2002; Reimsbach and Hauschild 2012; Corvello et al. 2021). Also, the legal form of ventures is an important dimension that scholars often describe. This dimension is especially of great significance for transformational arrangements (Keil 2000), i.e., spin-offs, which separate from the parent organization (Parhankangas and Arenius 2003), and acquisitions, typically becoming part of the organization in the form of a merger (Puranam et al. 2006).

Based on the structural implementation of CV activities, researchers have often made assumptions about the autonomy of ventures and the investment practices of corporations (Lee et al. 2018). However, a more fine-grained view shows that autonomy is a more complex concept that is difficult to measure objectively as it involves multiple facets that are not directly observable (Burgers et al. 2009; Johnson 2012; Souitaris and Zerbinati 2014; Waldkirch et al. 2021).

Therefore, a broad literature stream adopted the concept of operational and strategic autonomy, which describes the autonomy of ventures and/or CV units to operate independently from other business units of the corporation, as well as being responsible for setting their strategic objectives and milestones (Johnson 2012; Garrett and Covin 2015; Waldkirch et al. 2021). Although the structural separation signifies that the CV activities become more autonomous, it is not a causal relationship (Burgers

et al. 2009; Lee et al. 2018). Therefore, future research must recognize the complex relationship settings in more detail to yield a better overview of the actual CV practices (Souitaris and Zerbinati 2014).

For intermediation, other factors that describe the unit's strategic and operational autonomy are the funding and ownership structure, syndication and partnerships with third parties, the investment approval process, and involvement of other business units (Siegel et al. 1988; Keil 2000; Hill and Birkinshaw 2014; Souitaris and Zerbinati 2014; Kanbach and Stubner 2016; Kohut et al. 2021).

If the venture exists as a separate legal entity, the existence and amount of equity shares the corporation holds are relevant. These can be characterized as minority equity investments, with CAs, CVCs, and spin-offs typically taking less than 20% (Becker and Gassmann 2006; Semadeni and Cannella 2011; Kohler 2016), while corporations typically take more equity in joint ventures or majority equity investments, which are acquisitions with equity stakes of 50% or more (Titus et al. 2017).

In addition to the equity stake, the number of board seats is often considered a relevant characteristic of autonomy (Maula et al. 2009; Wang et al. 2021). However, board seats are also a way for corporations to monitor venture's technology developments (Dushnitsky and Lenox 2005), while the equity involvement is primarily concerned about control and financial returns (Kohler 2016; Hussinger et al. 2018; Huang and Madhavan 2021).

Lastly, alliances, such as licensing or joint projects (Keil et al. 2008; Simon et al. 2019) or accelerator and incubation programs that provide mentoring services, financial and non-financial support (Pauwels et al. 2016; Shankar and Shepherd 2019) are a significant characteristic of inter-organizational relationships to explain knowledge flows (Kang et al. 2021) and the corporate's involvement (Roberts and Berry 1985; Schildt et al. 2005; Gonzales and Ohara 2019; Kang et al. 2021) which further determines the autonomy of ventures (Burgers et al. 2009).

Third, the external factors of CV are described, often recognized as screening criteria to identify startups or have moderating effects on the collaboration itself (Keil et al. 2008; Johnson 2012; Shankar and Shepherd 2019). This includes where the idea and technology of the venture originated, which may be internally, externally, or jointly (Gassmann and Becker 2006; Covin and Miles 2007; Hill and Birkinshaw 2008). This is often the primary characteristic of internal corporate ventures, created by internal knowledge, and followingly may reside within the organization or become separate legal entities (Johnson 2012). However, some scholars also used this dimension as a prerequisite for CV in general (Thornhill and Amit 2001; Waldkirch et al. 2021). The dimension of the venture's origin, also the 'locus of opportunity' (Hill and Birkinshaw 2008), often coincides with the existence of separate legal entities (Sharma and Chrisman 1999; Reimsbach and Hauschild 2012), which led previously to ambiguity and should be more precisely defined by scholars.

The dimension of relatedness describes the similarity of technology and industry knowledge between the corporation and venture (Roberts and Berry 1985; Becker and Gassmann 2006), as well as the scope within the venture portfolio (Kanbach and Stubner 2016; Yang et al. 2016). The dimension of relatedness is best characterized by a low, medium, and high level of relatedness (Keil et al. 2008) and a narrow or broad scope of search (Kanbach and Stubner 2016; Yang et al. 2016). Additionally,

the strategy and outcomes of CV are often made about incrementally and radically innovation (Kohut et al. 2021) or exploration and exploitation (Schildt et al. 2005; Lee et al. 2018; Shuwaikh et al. 2022a).

The dimension of time horizon also showed significant importance in the CV literature. Typically, scholars differentiate between short-, mid-, and long-term perspectives without specifying the exact time spans for each period (Weiblen and Chesbrough 2015). Furthermore, the mid-term horizon is often associated with the short-term time horizon to apply a dual perspective (Shankar and Shepherd 2019; Huang and Madhavan 2021). We find that the short-term time horizon is associated with a period within a year, for example, the typical duration of a CA program (Kohler 2016; Veit et al. 2021). A time horizon exceeding one year is often considered long-term (Markham et al. 2005), making the differentiation to a mid-term time horizon more imprecise. Thus, a more accurate definition of this dimension is necessary to fully comprehend its effects and role in CV.

Scholars often apply the time horizon for the duration of CV units operating (Hill and Birkinshaw 2008; Sears et al. 2022), the period of collaborations with one venture, as they may develop over time (Roberts and Berry 1985; Michl et al. 2012; Ceccagnoli et al. 2018; Kurpjuweit and Wagner 2020) and specific modes, such as CVC and Cas (Weiblen and Chesbrough 2015; Corvello et al. 2021). Additionally, the time horizon can be linked to the expected CV outcomes, whether financial or strategic (Shankar and Shepherd 2019; Huang and Madhavan 2021; Shuwaikh et al. 2022b).

Lastly, the development stage is also a critical dimension considered by scholars in the field of CV due to the nature of startups being young organizations and the heterogeneity between those phases (Thornhill and Amit 2001; Johnson 2012; Hussinger et al. 2018; Rossi et al. 2021; Gerdsri and Manotungvorapun 2021). The dimension also impacts the time horizon, as more developed startups typically need less time for further development (Enkel and Sagmeister 2020), which also highlights its importance for providing adequate support and giving enough operational and strategic autonomy to ventures (Johnson 2012; Covin et al. 2020). In the CVC literature stream, the definition of development stages is based on the financing round, considering pre-seed and seed financing rounds as early, round A as middle, and all following as late stages (Rossi et al. 2020b; Balz et al. 2022), scholars from other fields define the stages based on performance results, such as the first year of receiving financial investment as the early stage, starting to generate revenues as mid-stage and becoming profitable as established stage (Thornhill and Amit 2001; Johnson 2012).

5 Limitation and discussion

5.1 Limitations

Even though the research in this study was done and crosschecked by different researchers applying good scientific practice, using well-known and often used methodologies from Kitchenham and Charters (2007), Kitchenham et al. (2009),

Webster and Watson (2002) and considering different recommendations for the research process to ensure rigor and consistency such as Fisch and Block (2018), this paper has some limitations.

First, our study is harmonizing CV dimensions. Doing so, one could argue that the dimensions are fragmented or partly incomplete or that different dimensions can be broken down into more characteristics. However, we extract these dimensions from 100 research studies under the given search string. Yet, other dimensions can be found in the academic discourse in the future, representing real business issues. Also, we tried to focus on characteristics that are valid for all external CV modes, leaving out highly focused individual characteristics.

Second, our bibliographic analysis is based not only on the overall CV landscape but also on the 100 considered publications for this study. We are aware that with this approach, we might cover only some of the CV research landscape. However, we only wanted to include papers that could be used to develop the different CV dimensions. By performing the forward–backward search, we open up the time restriction and include possible papers that are not directly in the scope of our search string. Therefore, the bibliographic analysis does not represent the CV research landscape but the landscape for harmonized CV dimensions.

Third, one could argue that Gutmann (2018) did not include a paper in his work that was ultimately relevant to our research because we analyzed and included new dimensions. However, we believe the current research front entails the appropriate knowledge base for the new SLR (Gutmann 2018).

5.2 Discussion and conclusion

We analyzed 100 relevant studies after screening more than 3000 publications. All 100 studies are suitable for finding and harmonizing corporate venture dimensions and characteristics. In doing so, we first performed a bibliometric analysis to provide academics and practitioners an overview of the corporate venturing research landscape and provide maximum objectivity for the following SLR. In that conceptual SLR, we used the research dimensions of Gutmann (2018) as a basis, confirmed its dimensions, and deeply extended it due to significantly new knowledge. In addition, we found three new dimensions, namely Time Horizon, Relatedness, and Development Stage, and built a framework that shows the interplay between all old and new dimensions. The interplay between those dimensions is crucial because they cannot be seen as individual, delimited but interwoven blocks.

First, when looking at bibliometric data, it is vital to have a good database for the analysis done with VOSviewer. According to Szomszor et al. (2021), using a dataset that is as accurate and precise as possible is especially important to avoid falsified outcomes. That is why we manually gathered information outside our SCOPUS dataset and double-checked and standardized all inconsistencies. Our bibliometric analysis results indicate that research on the different dimensions is not done equally. The attention on some categories is more significant than on others due to the point in time the research was first mentioned in the scientific literature. For example, Roberts and Berry (1985) defined what we defined as relatedness the first

time (42 studies), while Time Horizon was mentioned later and only has 20 publications in our research. The fact that different dimensions have different practical implementations amplifies this effect.

When examining the keywords, one can see that CVC is more often mentioned than other modes, such as alliances and spin-offs. One reason, among others, is that CVC has more publicly available data, giving researchers more possibilities for analyses. This is also in line with the nature of our study, focusing on empirical studies primarily based on complex data such as transactions, patents, etc. When looking at the most research-intensive countries, as already mentioned, the US is still leading. This aligns with Narayanan et al. (2009), who found that most publications are in English. Also, one of our critical selection criteria was that publications must be written in English. To our surprise, China was not among the top countries, even though they have some of the most recent publications. We expected China to have more publications in our dataset because China is committed to gaining academic leadership and wants to build world-class universities (Yue et al. 2021).

Second, our SLR can confirm the seven dimensions mentioned by Gutmann (2018) from an empirical point of view. However, most dimensions have been extended a lot and now contain significant new knowledge developed more recently. Looking at Chapter 4.6, "level of (investment) intermediation", as an example, we added the financial vs. non-financial view to Gutmann's (2018) direct vs. indirect view. Looking at chapter 4.4, "Ambidexterity", we added new research, differentiating between the approach to achieve exploration and exploitation simultaneously and seeing it more as a strategic logic with different approaches. Here, a more recent study points out that CV units can be structurally separated, aiming individually for exploration and exploitation, and thus achieve ambidexterity (Shuwaikh et al. 2022a) or that CV units can achieve ambidexterity across periods by achieving first exploration or exploitation and subsequently pursue the complement (Shuwaikh et al. 2022a). All these extensions of the existing dimensions, together with the three new dimensions, "Time Horizon", "Relatedness", and "Development Stage", were developed in the last years and confirmed us in updating and extending the existing SLR.

The conceptual framework should help us to see an interaction between the identified dimensions. This is especially important because articles containing a framework are more impactful and valuable (Paul et al. 2021). We show that the dimensions can be classified into CV strategy, organizational profile, and venture focus. Even though the framework and its subcategories are simplified, it quickly explains the interaction between the different dimensions. These dimensions are not mutually exclusive and, to some extent, can become blurred. However, even a simplification helps to inform practitioners what to consider.

Looking at the increased interest in CV research and the number of publications mentioned in Chapter 3, we encourage future researchers to update these CV dimensions once new knowledge is available or a reasonable time span has passed. For example, we name the dimension Time Horizon, for which a more accurate definition is necessary to fully comprehend its effects and role for CV. The dimensions and the mentioned framework help practitioners gain awareness about the connections and interplay between dimensions that must be considered in a decision-making

process to choose a best-fitting mode. Also, this SLR will help future researchers get an overview of the current research landscape when looking at CV dimensions.

As said in the introduction, our initial goal is to gather information that can help us with our project of building a CV taxonomy. For this, we did not find state-of-the-art information in the existing literature that harmonizes all CV dimensions. We believe that with this literature review, we provide a solid basis to categorize CV modes.

In summary, this paper identified many new characteristics for the existing dimensions and added new ones. In addition, we provided an objective overview of the research landscape toward harmonizing CV dimensions and their characteristics based on our selected studies. The derived framework also helps practitioners see the state-of-the-art research dimensions to make research-backed decisions when choosing and founding different ventures.

Appendix

Concept-based matrix for SLR

References	CV activity	Key contribution	Primary objectives	Origin of opportunity	Equity involvement	Intermediation	Strategic autonomy	Operational autonomy	Innovation flow	Ambidexterity	Relatedness	Time horizon	Development stage
Anokhin et al. (2011)	CVC	The syndication strategy of CVCs can be divided into 'maximizing isolationist' and 'minimizing centralist'	X		X	X							
Anokhin et al. (2016)	CVC	Effect of four investment strategies (driving, emerging, enabling, and passive) on the corporation's innovative opportunities	X					X		X	X		
Bae and Lee (2021)	Spin-off, CVC	High technological overlap (spinout—parents firm) deters potential corporate investors from making an investment									X		
Balz et al. (2022)	CVC, IVC	Four main drivers of value creation in CVC-IVC syndications	X	X	X	X	X	X			X	X	X
Battistini et al. (2013)	CVC	Organizational models regarding the CVCs main rationale (strategic, financial, or balanced)	X			X							
Becker and Gassmann (2006)	CVC, startup programs	Typology for CV modes that actively support the startup's development (including CVC, accelerators, and incubators)	X	X	X			X	X		X		

References	CV activity	Key contribution	Primary objectives	Origin of opportunity	Equity involvement	Intermediation	Strategic autonomy	Operational autonomy	Innovation flow	Ambidexterity	Relatedness	Time horizon	Development stage
Benson and Ziedonis (2009)	CVC	The information gained through CVC investing could improve firm performance			X								
Braune et al. (2021)	CVC	The return of CVC investments is sufficient for corporation's and relationships with VCs provide an essential source of information	X			X							
Burgers et al. (2009)	CV	Structural separation and integrational mechanisms affect the corporation's CV activities		X			X	X			X		
Ceccagnoli et al. (2018)	CVC, licensing, acquisition, alliances, JV	Based on real option theory, a distant search scope of corporate investors increases the probability of CVC investments relative to other modes		X							X	X	X
Chen et al. (2022)	CVC	Matching response of corporate rivals depends on industry relatedness and investment amount	X					X			X		
Cirillo (2019)	Spin-off, CVC, alliances	Spin-offs improve the patent quality for unfamiliar components		X				X		X	X		

References	CV activity	Key contribution	Primary objectives	Origin of opportunity	Equity involvement	Intermediation	Strategic autonomy	Operational autonomy	Innovation flow	Ambidexterity	Relatedness	Time horizon	Development stage
Clarysse et al. (2011)	Spin-off	Spin-offs have a greater growth potential when they are less related to the corporation		X						X	X		
Clauss et al. (2021)	CV	Ambidexterity in conjunction with strategic agility affects the competitive advantage of firms								X			
Corvello et al. (2021)	External CV	Antecedents, processes and outcomes of collaboration between corporates and start-ups	X		X	X		X				X	X
Covin et al. (2020)	Internal CV	Operational autonomy is beneficial for startups with low strategic clarity		X				X					X
Covin and Miles (2007)	CV	Five models that describe the relationship between corporate venturing and the corporation's business strategy		X		X							
Di Lorenzo and van de Vrande (2019)	CVC, spin-off	Employee mobility facilitates knowledge flows from corporations to ventures						X					
Di Lorenzo and Sabel (2023)	CVC	Late stage invetsments increase venture revenues but decrease venture R&D intensity			X								X

References	CV activity	Key contribution	Primary objectives	Origin of opportunity	Equity involvement	Intermediation	Strategic autonomy	Operational autonomy	Innovation flow	Ambidexterity	Relatedness	Time horizon	Development stage
Dushnitsky and Lenox (2005)	CVC	CVC investments can increase the corporation's patent citations in weak IP regimes	X		X	X		X			X		
Dushnitsky and Shaver (2009)	CVC	CVC investments often fail due to startups fear of misappropriation, creating a so-called "CVC paradox"					X				X		
Dushnitsky and Yu (2022)	CVC	Besides creating a window on technology, corporations invest in startups to harness economic growth	X										
Enkel and Sagmeister (2020)	Startup program, accelerator, incubator, alliances, CVC	Dynamic capabilities of CV modes to access startup's capabilities to innovate	X		X			X		X		X	
Ernst et al. (2005)	CVC	Prioritization of objectives in CVC units	X	X	X	X	X	X			X	X	
Flamand and Frigant (2017)	CVC	Objectives of CVCs in car manufacturing corporations	X		X	X					X		

References	CV activity	Key contribution	Primary objectives	Origin of opportunity	Equity involvement	Intermediation	Strategic autonomy	Operational autonomy	Innovation flow	Ambidexterity	Relatedness	Time horizon	Development stage
Garrett and Covin (2015)	Internal CV	Operational autonomy as a knowledge flow impediment, moderated by relatedness and strategic autonomy		X			X	X		X	X		
Gerdsri and Manotungvorapun (2021)	CVC	Framework for characterizing a startup's development stage						X					X
Gonzales and Ohara (2019)	CVC, alliances	Differentiate three CVC investor types: corporate fund, strategic investor, and strategic partnerships	X		X	X		X				X	X
Guo et al. (2015)	CVC, acquisition and VC	CVCs typically support startups over a longer period and with more capital than independent VCs	X			X		X				X	
Gutmann et al. (2019)	CVC	Framework for value creation and value capture services from CVCs to support startups	X					X					
Gutmann et al. (2023)	CVC	Discusses knowledge flows in the context of CVC							X				

References	CV activity	Key contribution	Primary objectives	Origin of opportunity	Equity involvement	Intermediation	Strategic autonomy	Operational autonomy	Innovation flow	Ambidexterity	Relatedness	Time horizon	Development stage
Haslanger et al. (2022)	CVC	Meta-analysis on CVCs' strategic and financial outcomes	X		X	X						X	
Hill and Birkinshaw (2008)	CV	Typology for CV units based on the locus of opportunity and strategic logic	X	X		X			X	X		X	
Hill and Birkinshaw (2014)	CV	CV units become ambidextrous by nurturing a supportive relational context	X	X		X				X		X	
Hill et al. (2008)	CVC	Application of independent VCs' investment practices in the context of CVCs	X	X	X	X					X	X	
Huang and Madhavan (2021)	CVC	Meta-analysis on CVCs' strategic and financial outcomes	X		X							X	
Hussinger et al. (2018)	CVC	Impact of corporation's support and control on the extend of innovation outcomes	X	X			X	X			X		X
Johnson (2012)	Internal CV	Impact of strategic and planning autonomy on venture success, moderated by the development stage		X			X	X					X

References	CV activity	Key contribution	Primary objectives	Origin of opportunity	Equity involvement	Intermediation	Strategic autonomy	Operational autonomy	Innovation flow	Ambidexterity	Relatedness	Time horizon	Development stage
Kanbach and Stubner (2016)	Corporate accelerator	Typology for corporate accelerators, including objectives and design configurations	X	X	X	X				X	X		X
Kang et al. (2021)	CVC, acquisition	Complementarities between financial and strategic outcomes, but negative impact of prioritized financial objectives and early-stage investments on knowledge spillovers in CVC investments	X		X			X					X
Keil (2000)	CVC, alliances, acquisition, JV, spin-off	Framework for external corporate venturing modes	X	X	X	X		X		X			
Keil et al. (2008)	CVC, alliances, acquisition, JV	Effect of venture relatedness and CV mode on corporate innovation outcomes		X							X		

References	CV activity	Key contribution	Primary objectives	Origin of opportunity	Equity involvement	Intermediation	Strategic autonomy	Operational autonomy	Innovation flow	Ambidexterity	Relatedness	Time horizon	Development stage
Kim and Steensma (2017)	Spin-off	Corporations benefit more from knowledge spillins of spin-offs than from CVC investment with employee mobility		X			X	X					
Kohler (2016)	Corporate accelerator	Framework and strategies for designing corporate accelerators	X	X	X	X	X	X			X	X	X
Kohut et al. (2021)	CVC	Implications of objectives and organizational profile on CVC performance	X	X					X	X	X		
Kurpjuweit and Wagner (2020)	Startup supplier programs, corporate accelerator	Characterization of startup-supplier programs	X	X	X	X		X				X	X
Lee et al. (2015)	CVC	Effects of autonomy of CVC units and technological relatedness on organizational knowledge transfer	X			X		X		X			
Lee et al. (2018)	CVC	Effects of autonomy CVC units on explorative/ radical and exploitative/ incremental innovation outcomes	X			X				X	X		

References	CV activity	Key contribution	Primary objectives	Origin of opportunity	Equity involvement	Intermediation	Strategic autonomy	Operational autonomy	Innovation flow	Ambidexterity	Relatedness	Time horizon	Development stage
Lin (2020)	CVC, JV, Strategic alliance	Impact of a corporation's knowledge and resources on a new venture's innovation performance		X		X		X					
Ma (2020)	CVC	CVCs' rationale is to fix innovation weaknesses by investing in technologically related ventures	X							X	X	X	
Maas et al. (2020)	CVC	Comparison of investment criteria between CVCs and independent VCs, including development stage, amount and objectives	X				X						X
Markham et al. (2005)	CVC	Differentiation of direct and indirect investments via venture capital funds	X	X	X	X	X					X	X
Masulis and Nahata (2009)	CVC	Impact of relatedness and development stage on board representation and funding of CVC investors	X	X		X	X				X		X
Maula et al. (2009)	CVC	Relatedness (complementary) positively affects social interaction in CVC investments and reduces safeguards					X	X			X		

References	CV activity	Key contribution	Primary objectives	Origin of opportunity	Equity involvement	Intermediation	Strategic autonomy	Operational autonomy	Innovation flow	Ambidexterity	Relatedness	Time horizon	Development stage
Michl et al. (2012)	Spin-off, CVC, incubator, acquisition	Framework regarding complementary use of internal and external CV activities (spin-along) to achieve ambidexterity	X	X		X				X		X	
Miles and Covin (2002)	CV	Typology of CV investments regarding locus of opportunity and intermediation	X	X		X	X	X					
Moschner et al. (2019)	Corporate accelerator	Typology of corporate accelerators, including objectives and organizational profile	X	X	X	X		X		X	X	X	X
Napp and Minshall (2011)	CVC	Framework of CVCs, including strategic goals, operational implementation and outcomes to become ambidextrous	X	X	X		X			X			
Nesner et al. (2020)	Corporate accelerator	Typology for corporate accelerators, including objectives and design configurations	X	X		X		X				X	
Paik and Woo (2017)	CVC	Increasing CVC ownership is positively associated with the venture's innovativeness					X	X					
Parhankangas and Arenius (2003)	Spin-off	Taxonomy of spin-offs regarding relatedness and operational autonomy		X			X	X			X	X	X

References	CV activity	Key contribution	Primary objectives	Origin of opportunity	Equity involvement	Intermediation	Strategic autonomy	Operational autonomy	Innovation flow	Ambidexterity	Relatedness	Time horizon	Development stage
Park et al. (2019)	CVC	A syndicate with CVC investors is associated with a lower concentration of investors					X						
Pauwels et al. (2016)	Accelerator	Typology of accelerators (3), including objectives and organization profiles	X	X	X	X		X			X	X	X
Puranam et al. (2006)	Acquisition	Coordination-autonomy dilemma when acquiring startups regarding their development stage of innovation trajectories	X		X		X	X		X			X
Roberts and Berry (1985)	internal CV, acquisition, licensing, joint ventures, CVC	Framework for entry strategies of CV in regard to industry and technological relatedness level		X				X			X	X	
Röhm et al. (2018)	CVC	Investment objectives of CVCs as important factors in explaining the valuations of startups	X										X
Rossi et al. (2020a)	CVC	Positive correlation between the number of deals and total investment amounts of CVCs	X					X					

References	CV activity	Key contribution	Primary objectives	Origin of opportunity	Equity involvement	Intermediation	Strategic autonomy	Operational autonomy	Innovation flow	Ambidexterity	Relatedness	Time horizon	Development stage
Rossi et al. (2020b)	CVC	Identification of exploration and exploitation strategies of CVC investments	X					X		X	X		X
Rossi et al. (2020c)	CVC	Identification of exploration and exploitation strategies of CVC investments				X		X		X	X		X
Rossi et al. (2021)	CVC	A typology for three investment types regarding the level of ambidexterity based on investment round, amount and objectives	X			X		X		X			X
Schildt et al. (2005)	CVC, alliances, JV, acquisition	Level of relatedness and CV mode (autonomy level) as antecedents for explorative/radical and exploitative/incremental learning performance		X	X			X		X	X		
Schnellbächer et al. (2019)	CV	Introduction of individual ambidexterity across different organizational levels								X			
Sears et al. (2022)	CVC	Corporations establish credible commitments (continuous and large investments) to alleviate startup's fear of misappropriation in related industries	X					X			X	X	

References	CV activity	Key contribution	Primary objectives	Origin of opportunity	Equity involvement	Intermediation	Strategic autonomy	Operational autonomy	Innovation flow	Ambidexterity	Relatedness	Time horizon	Development stage
Semadeni and Cannella (2011)	Spin-off	The positive influence of equity involvement and board seats (level of autonomy) for intermediate levels on spin-off performance		X			X	X			X		
Shankar and Shepherd (2019)	Corporate accelerator	Two path-ways of corporate accelerators (accelerating strategic fit or venture emergence), including their strategy, process and outcomes	X	X	X	X		X			X	X	
Shuwaikh et al. (2022a)	CVC	Sequential ambidexterity is superior to balanced and simultaneous ambidexterity approaches	X							X	X	X	
Shuwaikh et al. (2022b)	CVC, acquisition	CVCs' greater funding increases the likelihood of IPO exit, which is reduced by a longer investment duration	X			X		X				X	
Siegel et al. (1988)	CVC	CVC investors differentiate between co-pilots (little autonomy from the corporation) and pilots (autonomous from the corporation)	X		X	X							
Simon et al. (2019)	Non-equity alliances	Complementary assets, risks and relational characteristics influence the willingness of startups to enter collaborations with corporations, dependent on the development stage	X	X	X		X	X			X		X

References	CV activity	Key contribution	Primary objectives	Origin of opportunity	Equity involvement	Intermediation	Strategic autonomy	Operational autonomy	Innovation flow	Ambidexterity	Relatedness	Time horizon	Development stage
Sorrentino and Williams (1995)	Internal CV	Influence of the level of relatedness on the venture performance		X				X			X		
Souitaris and Zerbinati (2014)	CVC	Investment practices of CVCs are characterized as a continuum between integrated and arm's length investment logic	X			X		X					X
Sykes (1990)	CVC	Direct and indirect investment approaches for corporations to achieve strategic objectives	X			X		X					
Szalavetz and Sauvage (2023)	CVC	Motivation (strategic/financial) is difficult to decide, so many CVCs often have hybrid motivations	X								X		
Thornhill and Amit (2001)	Internal CV	Relational and economic ties (autonomy) in association with venture success		X			X	X					X
Titus et al. (2017)	CVC, acquisition, JV	Disruptive corporations are positively related to the relative usage of acquisitions	X	X	X		X			X			
Urbaniec and Żur (2021)	Corporate accelerator	Identify the motives (exploration or exploitation) of corporations to launch corporate accelerators	X	X		X				X			

References	CV activity	Key contribution	Primary objectives	Origin of opportunity	Equity involvement	Intermediation	Strategic autonomy	Operational autonomy	Innovation flow	Ambidexterity	Relatedness	Time horizon	Development stage
Veer et al. (2022)	CVC	The positive effect of information disclosure on venture performance, mediated through complementarity					X				X		
Veit et al. (2021)	Corporate accelerator	Typology of corporate accelerators, including objectives and organizational profile	X	X	X	X		X		X	X	X	X
Wadhwa and Basu (2013)	CVC	The financial commitment of CVCs has a U-shaped relationship with the degree of exploration (technological and industry relatedness)						X		X	X		
Waldkirch et al. (2021)	Internal CV	Configuration of the role of the dominant coalition for the innovation performance of ventures		X			X	X					X
Wang et al. (2021)	CVC	Technological relatedness is positively associated with the venture's innovation performance and control rights acquired by CVCs, which mediates the relationship positively					X	X			X		
Weber and Weber (2007)	CVC	Relatedness is associated with knowledge transfer and creation, which enhance the venture performance						X			X		

References	CV activity	Key contribution	Primary objectives	Origin of opportunity	Equity involvement	Intermediation	Strategic autonomy	Operational autonomy	Innovation flow	Ambidexterity	Relatedness	Time horizon	Development stage
Weber and Weber (2005)	CVC	CVCs focus either on financial objectives, strategic objectives, or balance both	X			X							X
Weiblen and Chesbrough (2015)	CVC, startup programs	Four models of startup-corporation collaboration are described by its characteristics, challenges, and rationales	X	X	X	X	X	X	X		X	X	
Williams and Lee (2009)	CV	Typology of CV based on level of innovativeness and locus of opportunity	X	X						X			
Weiss et al. (2023)	CV	An exploratory model of strategic CV that includes organizational context factors	X	X						X			
Xiao et al. (2023)	CVC	CVC increases the product innovation effectiveness of entrepreneurial ventures, but decreases their efficiency			X								
Yang (2012)	CVC	Links organizational profile of CVC units (autonomy) to inter-organizational learning performance of corporation and venture	X		X	X	X	X					
Yang et al. (2016)	CVC	Autonomy of CVC units is positively associated with the diversification of the venture portfolio	X			X				X	X		

References	CV activity	Key contribution	Primary objectives	Origin of opportunity	Equity involvement	Intermediation	Strategic autonomy	Operational autonomy	Innovation flow	Ambidexterity	Relatedness	Time horizon	Development stage
Zahra and Hayton (2008)	CVC, acquisition, alliances	Absorptive capacity moderates the relationship between CV and corporate performance		X				X			X	X	

93 Most co-cited publications

Authors	Year	Title	Journal/publisher	Co-Citations
Dushnitsky G., Lenox M.J	2005	When Do Incumbents Learn From Entrepreneurial Ventures? Corporate Venture Capital And Investing Firm Innovation Rates	Research Policy	29
Dushnitsky G., Lenox M.J	2006	When Does Corporate Venture Capital Investment Create Firm Value?	Journal Of Business Venturing	29
Cohen W.M., Levinthal D.A	1990	Absorptive Capacity: A New Perspective On Learning And Innovation	Administrative Sciences Quarterly	23
March J.G	1991	Exploration And Exploitation In Organizational Learning	Organization Science	22
Block Z., Macmillan I.C	1993	Corporate Venturing: Creating New Business Within The Firm	Harvard Business School Press	21
Dushnitsky G., Lenox M.J	2005	When Do Firms Undertake R&D By Investing In New Ventures?	Strategic Management Journal	21
Benson D., Ziedonis R.H	2009	Corporate Venture Capital As A Window On New Technologies: Implications For The Performance Of Corporate Investors When Acquiring Startups	Organization Science	19
Chesbrough H.W	2002	Making Sense Of Corporate Venture Capital	Harvard Business Review	19
Katila R., Rosenberger J.D., Eisenhardt K.M	2008	Swimming With Sharks: Technology Ventures, Defense Mechanisms And Corporate Relationships	Administrative Sciences Quarterly	18
Siegel R., Siegel E., Macmillan I.C	1988	Corporate Venture Capitalists: Autonomy, Obstacles, And Performance	Journal Of Business Venturing	16
Ahuja G., Katila R	2001	Technological Acquisitions And The Innovation Performance Of Acquiring Firms: A Longitudinal Study	Strategic Management Journal	14

Authors	Year	Title	Journal/publisher	Co-Citations
Basu S., Phelps C., Kotha S.B	2011	Towards Understanding Who Makes Corporate Venture Capital Investments And Why	Journal Of Business Venturing	14
Chesbrough H.W	2003	Open Innovation: The New Imperative For Creating And Profiting From Technology	Harvard Business School Press	14
Dushnitsky G., Shaver J.M	2009	Limitations To Interorganizational Knowledge Acquisition: The Paradox Of Corporate Venture Capital	Strategic Management Journal	14
Gompers P.A., Lerner J	1998	The Determinants Of Corporate Venture Capital Success: Organizational Structure, Incentives, And Complementarities	University Of Chicago Press	13
Chesbrough H.W	2000	Designing Corporate Ventures In The Shadow Of Private Venture Capital	California Management Review	13
Chemmanur T.J., Loutskina E., Tian X	2014	Corporate Venture Capital, Value Creation, And Innovation	Review Of Financial Studies	10
Keil T	2002	External Corporate Venturing: Strategic Renewal In Rapidly Changing Industries	Quorum Books	10
Wadhwa A., Kotha S.B	2006	Knowledge Creation Through External Venturing: Evidence From The Telecommunications Equipment Manufacturing Industry	Academy Of Management Journal	9
Sykes H.B	1990	Corporate Venture Capital: Strategies For Success	Journal Of Business Venturing	9
Dushnitsky G., Lavie D	2010	How Alliance Formation Shapes Corporate Venture Capital Investment In The Software Industry: A Resource-Based Perspective	Strategic Entrepreneurship Journal	9
Rind K.W	1981	The Role Of Venture Capital In Corporate Development	Strategic Management Journal	9
Burgelman R.A	1984	Designs For Corporate Entrepreneurship In Established Firms	California Management Review	8

Authors	Year	Title	Journal/publisher	Co-Citations
Sharma P., Chrisman J.J	1999	Toward A Reconciliation Of The Definitional Issues In The Field Of Corporate Entrepreneurship	Entrepreneurship Theory And Practice	8
Schildt H.A., Maula M.V.J., Keil T	2005	Explorative And Exploitative Learning From External Corporate Ventures	Entrepreneurship Theory And Practice	8
Burgelman R.A	1983	A Process Model Of Internal Corporate Venturing In The Diversified Major Firm	Administrative Sciences Quarterly	8
Thornhill S., Amit R	2001	A Dynamic Perspective Of Internal Fit In Corporate Venturing	Journal Of Business Venturing	8
Eisenhardt K.M	1989	Building Theories From Case Study Research	Academy Of Management Review	8
Hill S.A., Birkinshaw J.M	2008	Strategy-Organization Configurations In Corporate Venture Units: Impact On Performance And Survival	Journal Of Business Venturing	8
Dushnitsky G., Shapira Z	2010	Entrepreneurial Finance Meets Organizational Reality: Comparing Investment Practices And Performance Of Corporate And Independent Venture Capitalists	Strategic Management Journal	8
Hardymon G.F., Denino M.J., Salter M.S	1983	When Corporate Venture Capital Doesn't Work	Harvard Business Review	8
Weiblen T., Chesbrough H.W	2015	Engaging With Startups To Enhance Corporate Innovation	California Management Review	8
Kohler T	2016	Corporate Accelerators: Building Bridges Between Corporations And Startups	Business Horizons	8
Nelson R.R., Winter S.G	1982	An Evolutionary Theory Of Economic Change	Harvard University Press	8
Levinthal D.A., March J.G	1993	The Myopia Of Learning	Strategic Management Journal	8
Biggadike R	1979	The Risky Business Of Diversification	Harvard Business Review	7
Allen S.A., Hevert K.T	2007	Venture Capital Investing By Information Technology Companies: Did It Pay?	Journal Of Business Venturing	7

Authors	Year	Title	Journal/publisher	Co-Citations
Keil T	2004	Building External Corporate Venturing Capability: Initial Conditions, Learning Processes And Knowledge Management	Journal Of Management Studies	7
Gompers P.A., Lerner J	1999	The Venture Capital Cycle	The MIT Press	7
Lane P.J., Lubatkin M.H	1998	Relative Absorptive Capacity And Interorganizational Learning	Strategic Management Journal	7
Hill S.A., Birkinshaw J.M	2014	Ambidexterity And Survival In Corporate Venture Units	Journal Of Management	7
Park H.D., Steensma H.K	2012	When Does Corporate Venture Capital Add Value For New Ventures?	Strategic Management Journal	7
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Declarations

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