



Corporate Venture Capital and the Influence of Dimensions of Autonomy on Financial Portfolio Performance

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Abstract

Title: Corporate venture capital and the influence of dimensions of autonomy on financial portfolio performance

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Corporate venture capital investments (CVC) are an attractive external source for corporate innovation and a significant startup funding source. The number of active CVC units, that manage incumbent firms CVC activities, increased constantly during the last decade. CVC units increase financial performance of startups in terms of higher valuations and liquidation events by providing access to resources and capabilities that go beyond financial support. While all CVC units add value to their corporate parent and portfolio companies by similar mechanisms, their structures vary considerably. One structural aspect discussed in academic literature and managerial practice is the appropriate level of autonomy of CVC units relative to the corporate parents. While past research concludes that higher autonomy levels are the better choice, it also identifies several benefits related to lower autonomy. One dimension of autonomy is related to CVC unit organizational structure and is called structural autonomy. Some CVC units are separate subsidiary entities with high structural autonomy, while others are corporate business units with low structural autonomy. This work finds that structural autonomy of CVC units does not significantly influence the financial performance of CVC portfolio companies based on quantitative research. Moreover, it suggests a relationship between structural autonomy and other dimensions of autonomy based on qualitative research. Ultimately, this work identified nine autonomy-dependent mechanisms beneficial for financial portfolio performance. It found that the majority of these mechanisms is more applicable for high autonomy CVC units which supports academic findings of high autonomy positively influencing financial portfolio performance.

Keywords: Corporate Venture Capital, Venture Capital, Investments, Innovation, Strategy, Autonomy

Sumário

Título: Os investimentos de capital de risco corporativo e as dimensões da autonomia que influenciam o desempenho do portfolio

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Os investimentos de capital de risco corporativo (CVC) são uma atrativa fonte externa de inovação e uma fonte significativa de financiamento de startups. O número de unidades CVC activas, a gerir actividades CVC das empresas mãe, aumentou constantemente durante a última década. As unidades CVC aumentam o desempenho financeiro das startups, proporcionando acesso a recursos que vão para além do apoio financeiro. Embora todas as unidades CVC acrescentem valor às suas empresas-mãe e empresas do portfolio por mecanismos semelhantes, as suas estruturas variam consideravelmente. Um aspecto estrutural discutido na literatura académica é o nível adequado de autonomia das unidades CVC. Embora estudos anteriores concluam que elevados níveis de autonomia são a melhor escolha, há também vários benefícios relacionados com uma menor autonomia. Uma dimensão da autonomia relacionada com a estrutura organizacional das unidades CVC é chamada autonomia estrutural. Algumas unidades CVC são entidades separadas com elevada autonomia estrutural, enquanto outras são unidades empresariais com baixa autonomia estrutural. Baseada em investigação quantitativa, esta dissertação conclui que a autonomia estrutural das unidades CVC não influencia significativamente o desempenho financeiro das empresas do portfolio CVC. Além disso, sugere uma relação entre a autonomia estrutural e outras dimensões de autonomia baseada na investigação qualitativa. Em última análise, este trabalho identificou nove mecanismos dependentes da autonomia benéficos para o desempenho financeiro dos portfolios das empresas. Verificou que a maioria destes mecanismos é mais aplicável às unidades CVC de alta autonomia, apoiando as conclusões académicas de que alta autonomia influencia positivamente o desempenho financeiro dos portfolios.

Palavras-chave: Capital de Risco Empresarial, Capital de Risco, Investimentos, Inovação, Estratégia, Autonomia

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List of abbreviations

VC	Venture Capital
CVC	Corporate Venture Capital
IVC	Institutional Venture Capital
RQ	Research Question
FP	Financial Performance
BU	Business Unit
ABV	Attention-based View
PP	Portfolio Performance
FPP	Financial Portfolio Performance
IPO	Initial Public Offering
IC	Investment Committee
IRR	Internal Rate of Return
BU	Business Unit
OA	Overall Autonomy
SA	Structural Autonomy
VA	Vertical Autonomy
HA	Horizontal Autonomy
IDMA	Investment Decision-Making Autonomy

Glossary

Venture Capital (VC)	The activity of private equity investments in young companies with high growth potential for an equity stake
Institutional Venture Capital (IVC)	Industry of management firms and funds in an organized market for venture activities
Corporate Venture Capital (CVC)	The activity of investments of corporate funds directly in external ventures (startups)
CVC Unit(s)	The corporate-owned units performing CVC activities in the name of the corporate parent
Subsidiary	Separate subsidiary entity
Business Unit	Non-separate corporate entity
Portfolio Companies	The startups a CVC unit has invested
Exit	Liquidation events (IPOs and M&A) of VC-backed ventures
Overall Autonomy	A CVC units' overall level of autonomy resulting from structural vertical and horizontal autonomy regarding operations and investment decisions
Structural Autonomy	The autonomy based on a CVC unit's organizational structure (subsidiary or business unit)
Vertical Autonomy	The autonomy in decision-making from the ones a CVC unit reports to (corporate executives)
Horizontal Autonomy	The autonomy in decision-making from managers of other corporate subsidiaries or business units
Operational Decision-Making	Decisions regarding operations (processes, human resources and technology equipment and tools)
Investment Decision-Making	Decisions regarding the CVC unit business purpose (venture capital investments), including where and when to invest

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1. INTRODUCTION

1.1 Background

To compete and adapt to changing environments, firms adopt different initiatives including minority investments in external ventures, strategic alliances, and acquisitions (Keil, 2002). The first of these, called Corporate Venture Capital (CVC), is a tool for achieving firm success (Basu, 2009). Both incumbent firms and companies receiving capital, also referred to as portfolio companies, benefit from these investments with the latter gaining access to strategic advice and industry knowledge in addition to financial support (Ivanov and Xie, 2010; Chemmanur, Loutskina, and Tian, 2012). CVC investment has become the second most crucial funding source for startups after institutional venture capital (IVC) (Basu, Wadhwa and Kotha, 2016) with 1,317 deals globally in the first quarter of 2022 representing an all-time high for CVC participation. In Europe alone, the investment amount was USD 6.7 billion in the first quarter of 2022 (CBInsights, 2022). Often, firms establish CVC units, establishing a team that carries out and is responsible for the firms CVC activities. The last decade saw constant growth of active CVC units globally, suggesting increasing relevance of CVC for incumbent firms. This growth peaked in 2020 with 1,177 active units (Silicon Valley Bank, 2021).

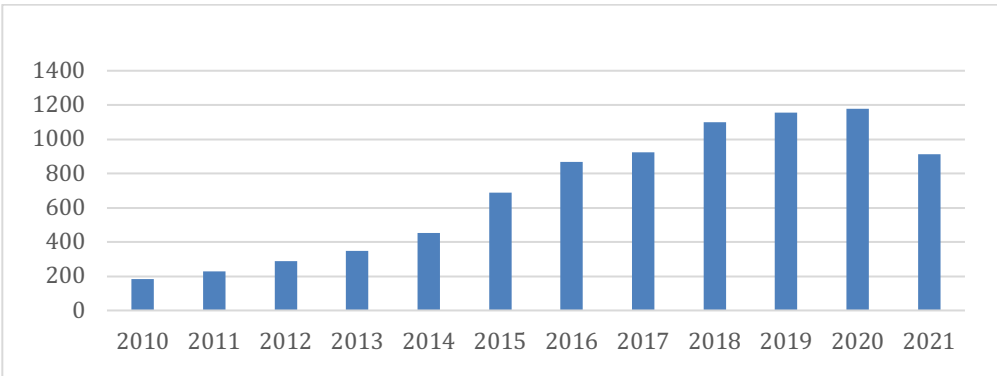


Figure 1 Number of active CVC units globally in the years of 2010 to 2021 (Silicon Valley Bank, “The State of CVC”, 2021)

While VC firms have relatively similar structures, CVC units show various structures (Dushnitsky, 2018). A dimension of CVC unit structure is organizational structure. Some CVC units are business units (BUs) of the incumbent firm, closely tied to the latter’s corporate

processes. But there are also CVC units that are wholly-owned subsidiary entities, less closely tied to corporate processes (Lee, Park, and Kung, 2018).

1.2 Problem Statement and Relevance

CVC units generally do strategic investments (Rind, 1981). Nevertheless, strategic benefits for the corporate parent are not the only goal and financial portfolio performance (FPP), measured as return on investment, is an ultimate objective. Silicon Valley Bank in 2021 states that financial returns are a KPI for 75% of CVCs, obtained through liquidity events such as initial public offerings (IPOs) or sales to third parties, just as for venture capitalists (Gompers and Lerner, 2000).

CVC units pursuing strategic and financial goals may be distinguished by their degree of overall autonomy (OA) relative to the corporate parent. This can be explained by agency theory, stating that the level of autonomy granted to agents (CVC unit) by the principal (corporate parent) is a decision to be carefully considered due to the trade-off between information asymmetry and monitoring costs (Yang, 2012; Eisenhardt, 1989).

One dimension of autonomy is structural autonomy (SA), defined by the organizational structure of a CVC unit. Two structures can be observed: First, treating a CVC unit as a separate subsidiary entity, which entails higher structural autonomy and less proximity to the corporate parent. However, other CVC units are corporate business units (BU's) with lower structural autonomy due to higher proximity to the corporate parent (Lee, Park, and Kung, 2018). Thus, degrees of structural autonomy (SA) vary considerably.

Past research on CVC unit OA shows that autonomy mechanisms influence FPP (Yang, 2012, Hill et al., 2009). The degree of OA relative to the corporate parent shapes how units operate, the way managers and teams make investment decisions, and how incentives and compensation work, etc. Ultimately, these factors influence the way a CVC unit supports its portfolio companies as an investor. Hence, managers must understand the impact of autonomy on portfolio performance.

1.3 Research Objective

The problem statement investigated in this paper is: “**What is the relationship between the autonomy of CVC units and portfolio performance?**” The problem is analyzed by answering the following research question (RQ) interrogating whether observable differences in SA are causal factors for financial portfolio performance (FPP). RQ: *"Does CVC structural autonomy influence portfolio performance?"*.

1.4 Research scope

The geographical scope of this work is CVC in Europe.

2. THEORETICAL DISCUSSION

The relationship between autonomy and FPP in corporate venture capital units is important in light of why CVC exists at all? With CVC units and their investments growing significantly, it is relevant to understand the motivation and goals of CVC units nowadays and how these units have to be set up for success. The relevant academic literature will now be reviewed on CVC and management theory.

2.1. Competitive advantage, dynamic capabilities, and ambidexterity

According to the resource-based view of the firm, for a company to acquire and sustain competitive advantage it must deploy a range of unique resources (Barney, 2002). The concept of dynamic capabilities seeks to go beyond the resource-based view by suggesting that competitive advantage accrues from "the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments" (Teece, Pisano, and Shuen, 1997, p. 516). These views suggest that a firm should possess a range of resources and capabilities to be successful and must adapt them over time. Barreto (2010) describes a firm's dynamic capabilities as the “potential to systematically solve problems formed by its propensity to sense opportunities and threats, to make timely and market-oriented decisions, and to change its resource base.” This is necessary to sustain competitive advantage while facing technological and market uncertainties (Lee & Kang, 2015; Adner and Helfat, 2003; Ethiraj et al., 2005; Helfat and Peteraf, 2003; Teece, Pisano, and Shuen, 1997). To cope with

change in the external environment, firms must further engage in incremental innovation while exploring new technologies and markets to enable disruptive innovation (Lee and Kung, 2015). Firms need to constantly adapt existing resources and acquire new ones (Hedberg et al., 1976). Christensen (1997) introduces the so-called "innovators dilemma" which proposes that to bring about disruptive innovation, the firm must distance itself from existing value networks and resources. More specifically, the dilemma can be described as follows: At university, business students are told that firms should always listen to their customers' needs and deliver on their desires while making investment decisions based on the probability of a high return. These goals are achieved by targeting large rather than small markets. However, since disruptive innovation begins with niche early adopters, it does not initially impact a firm's core customer base. (Christensen, 2016).

Ambidexterity refers to the ability of an organization to exploit several existing competencies at the same time (March 1991; Duncan 1976; Eisenhardt and Martin 2000; Raisch et al. 2009; Tushman and O'Reilly 1996; Lee & Kung, 2015). Exploitation refers to strategic use of technologies and resources to improve the efficiency of a firm's operations. Exploration, by contrast, is the search for new technologies and resources to acquire. As the name implies, ambidextrous firms are capable of successfully balancing both exploitation and exploration activities simultaneously. Accordingly, ambidextrous firms are able to build dynamic capabilities which support sustainable competitive advantage (Lee & Kung, 2015).

2.2 Value add of CVC for the corporate parent

Engaging with external ventures (startups) by CVC direct equity investments is a crucial instrument for established firms to perform exploitation and exploration activities. The portfolio of technological and strategical options created helps enhance a firm's dynamic capabilities (Lee and Kung, 2015). Exploitation develops new capabilities applicable in existing business. Exploration, however, is access to new technologies and markets that can be used to develop new business. CVC activities can be a practical external addition to internal R&D for corporate innovation (Dushnitsky and Lenox, 2005; Chesbrough, 2002; Maula and Murray, 2002).

Past research on the value add of CVC for the corporate parent uses alternative measures for performance, primarily, corporate innovation determined by the number of patents (Lee, Park,

and Kung, 2018; Dushnitsky and Lenox, 2005; Wadhwa and Kotha, 2006). An alternative measure is the level of technological diversification, found to be positively related to CVC activities (Lee and Kung, 2015). Technological diversification refers to different technologies to which a firm has access. Besides the positive effect of CVC on corporate innovation, academic literature also investigates CVC influence on overall firm value. It holds that firm value in terms of Tobin's Q is positively related to CVC activities (Dushnitsky and Lenox, 2006). **Summarized, CVC activities show a positive effect on corporate innovation and overall firm value according to academic literature.**

2.3 Value of CVC for portfolio companies

2.3.1 Strategic portfolio performance

Besides financial support, CVC units often offer other services to companies to whom they have allocated capital (Battistini, Hacklin, and Baschera, 2013; Maula, 2001; Gompers and Lerner, 1998). These value-adding services are termed "smart capital" (Maula, 2001, p. 15). Past research analyzing innovation productivity, measured as patent output and patent quality, showed that smart capital provided by CVCs positively affects portfolio companies (Battistini, Hacklin, and Baschera, 2013; Large and Muegge, 2008; Maula, 2001). **Academic literature concludes that by providing smart capital CVCs positively influence quantity and quality of patent output and therefore innovation productivity** (Chemmanur, Loutskina & Tian, 2014, Maula, 2001).

2.3.2 Financial portfolio performance

Academic literature further shows that CVC positively affects portfolio companies' likelihood of going public and achieving high valuations at exit events (Gompers and Lerner, 2000; Gompers, 2002; Ivanov and Xie, 2010). Innovation productivity is positively correlated to future valuations and liquidity events. Another factor positively influencing PP is a strategic overlap with the corporate parent's business (Ivanoc and Xie, 2010).

In summary, academic literature suggests that smart capital provided to portfolio companies positively influences strategic and financial portfolio performance, especially if there is a strategic overlap between the corporate parent and portfolio company (Chemmanur, Loutskina, and Tian, 2014).

2.4 Liquidation events and financial portfolio performance

The ultimate financial goal of corporate venture capital investors is achieving high return on investment (Gompers and Lerner, 2000). This return is realized through liquidation events in a CVC's portfolio. In venture capital, liquidation events are referred to as "exits". Most prominent exit strategies are IPOs or mergers and acquisitions (M&A) by third parties (Drover, Busenitz, Matusik, Townsend, Anglin, A., and Dushnitsky, 2017). The more exits a CVC has in its portfolio, the better chances are for high FPP. However, it must be paid attention to the fact that exits alone do not guarantee high return on investment. Another important measure is the portfolio company's valuation at the point of exit. The higher the valuation, the larger the return on a specific investment. **Summarizing, financial portfolio performance is influenced by liquidation event frequency and valuations at the time of liquidation.**

2.5 CVC autonomy

Agency theory provides arguments that help us understand high and low autonomy levels.

2.5.1 Agency theory and autonomy

A principal-agent relationship is defined by one party (the agent) acting on behalf of another party (the principal). Agency theory describes two possible problems arising from this relationship: **First, an agency problem** occurs when principals and agents have different desires. A principal may find it difficult to verify what the agent is doing and cannot ensure that the agent acts appropriately. **Second, there is the problem of risk sharing:** This arises when the principal and the agent have diverging attitudes towards risk, leading to a preference for different actions (Eisenhardt, 1989). Yang (2012) elaborated the level of CVC autonomy in light of the agency theory. Transferring the theory to CVC units, the corporate parent can be viewed as the principal while the CVC unit managers are agents. Yang states that whenever principals delegate tasks to agents, the latter are granted a certain level of autonomy.

2.5.2 In favor of high autonomy

According to agency theory, limiting CVC autonomy allows the corporate parent to monitor and control CVC managers' behaviors more closely. Less CVC autonomy tightens control (Yang, 2012). The cost of monitoring, however, will rise. Also, too much intervention may frustrate or decrease the efficiency of CVC managers, especially their ability to make decisions

quickly in the dynamic and competitive business environment (Gompers and Lerner, 2001). This leads one to assume that higher levels of autonomy are beneficial to CVC performance. **Indeed, Yang's research showed a positive relationship between CVC autonomy and corporate innovation productivity.**

Hill (2009) came to a similar conclusion, analyzing how specific IVC-like structures like vertical and horizontal autonomy influence performance of corporate venturing units. Vertical autonomy (VA) is defined as decision-making freedom regardless of to whom a unit reports. Horizontal autonomy (HA) is freedom of decision-making relative to managers of other corporate divisions. The study includes different types of corporate venturing activities (CV), including CVC units. Financial performance in Hill's study included FPP next to corporate-related financial performance measures of revenue growth and market capitalization. **Hill et al. conclude that CVC units' overall financial performance is positively correlated to high vertical autonomy.** Additionally, high HA is also associated with increased strategic performance (Hill et al., 2009).

Structural autonomy (SA) was another term elaborated in the literature. SA describes the organizational form of CVC units. There are subsidiary CVC units with high SA and ones with low SA. Past research showed that SA positively correlates with explorative innovation of incumbent firms. The influence of SA on financial performance was not investigated (Lee, Park, and Kung, 2018).

2.5.3 In favor of low autonomy

Academic literature also identifies several disadvantages of autonomy. Autonomy is associated with information asymmetry (Eisenhardt, 1989; Gerhart and Milkovich, 1990; Gomez-Mejia, 1992; Rajagopalan and Finkelstein, 1992) as firms aim to leverage capabilities and resources of portfolio companies to perform ambidextrous activities. **Corporations may decide to grant lower levels of autonomy to their CVC units to reduce information asymmetries.**

Another argument for low CVC autonomy is the so-called selection effect. Past research showed that compared to IVCs, CVC is superior when identifying and selecting companies with higher innovation potential, which delivers better financial returns in the long run. This comes from CVCs' access to industry and technology knowledge (Chemmanur, Loutskina and Tian,

2015; Ivanoc and Xie, 2010; Yang, Narayanan and Zahra, 2009). Additionally, the involvement of corporate business units (BU) in CVC activities contributes to learning from the portfolio companies (Dushnitsky and Lenox, 2005a). Moreover, lower structural autonomy as for business units was found to positively influence exploitive corporate innovation activities due to the closer ties between incumbent firms and portfolio companies (Lee, Park, and Kung, 2018). **Thus, superior knowledge transfer mechanisms can be an advantage of low CVC autonomy.**

In favor of high autonomy	In favor of low autonomy
<ul style="list-style-type: none"> ● Reduced corporate costs of monitoring activities ● Improved CVC performance through autonomous decision-making ● Improved exploration activities 	<ul style="list-style-type: none"> ● Reduced information asymmetry (superior knowledge transfer) ● Improved exploitation activities ● Better investment selection (selection effect)

Table 1. Arguments for high and low autonomy according to academic literature

2.6 Contribution to research and research hypothesis

Summarizing, CVC contributes to both corporate parent and companies' innovation productivity and financial performance. While some academic literature on CVC autonomy proposes advantages of both higher and lower levels of autonomy, mechanisms and dimensions of CVC autonomy can be rendered more explicit.

This work seeks to contribute to academic literature in two ways. First, it analyzes if organizational structure, and therefore SA, has an influence on FPP, hence answering the RQ. Based on the finding that organizational structure influences strategic performance (Lee, Park, and Kung, 2018), the researcher assumes that this could also influence financial performance. Furthermore, based on research performed by Yang and Hill in 2012 and 2009 on CVC autonomy influencing overall portfolio performance, the prevailing assumption is that SA is beneficial to FPP. Thus, the hypothesis of the analysis is H1: *Structural autonomy has a significantly positive influence on financial portfolio performance.*

The hypotheses will be tested in the quantitative analysis section of this study described in the next chapter. **The findings may help managers make decisions about organizational structures of CVC units to achieve financial KPIs.**

This work contributes to studies of autonomy and performance, supplying practical insights on autonomy-dependent mechanisms in CVC units. **These findings may help managers better understand the implications of autonomy and enable them to make autonomy-related decisions beyond deciding on organizational structures when setting up CVC units.**

3. RESEARCH METHODOLOGY

The chapter is divided into sections addressing the research design, primary and secondary data collection, and data analysis procedures for the mixed method approach used.

3.1 Research design

To answer the RQ "*Does CVC structural autonomy influence portfolio performance?*", a quantitative analysis of a cross-sectional data sample was performed. The unit of analysis was "European CVC units". The majority of the sample was secondary data provided by a data platform with two more descriptive variables collected and added to the data sample. The quantitative approach was chosen to achieve valid, generalizable results about the influence of SA on portfolio performance.

There was also qualitative research using semi-structured expert interviews. To achieve a level of comparison and pattern recognition there were pre-defined questions complemented by adapting and adding more questions based on the interviewee's knowledge and openness.

3.2 Data collection methods

3.2.1 Primary data collection methods

This project tries to find and understand explicit mechanisms associated with autonomy, to attain a more detailed understanding of the effect autonomy can have on CVCs and their portfolios. This included non-numerical information received from CVC employees and managers. Qualitative research is well-suited to exploring and understanding complex phenomena (here, autonomy) through collecting information (Williams, 2007).

Semi-structured interviews were chosen as a method since they are "a valuable means of asking open-ended questions to find out what is going on and to gain insight into a topic of interest"

(Saunders et al., 2017, p. 186). These interviews sought to gain specialist knowledge from industry experts on the mechanisms related to autonomy and portfolio performance. The eight participants making up the sample were European CVC employees meeting the eligibility criteria of being full-time employees of a CVC headquartered in Europe.

Participants were assembled by voluntary response sampling: The researcher used LinkedIn, to find subjects working in European CVC units. The volunteers were then contacted via private message, and interviews were arranged. Interviews were conducted online via Microsoft Teams and lasted between 30 and 55 minutes each.

ID	Role	Corporate Industry	Country	Length
Interviewee A	Investment Manager	Special Chemistry	Germany	50 min
Interviewee B	Head of CVC	Energy	Spain	45 min
Interviewee C	Head of CV	Consumer Goods	Germany	55 min
Interviewee D	Investment Manager	Insurance	Netherlands	30 min
Interviewee E	Investment Analyst	Utilities	France	45 min
Interviewee F	Head of CVC	Logistics	UK	55 min
Interviewee G	Investment Manager	Insurance	Germany	45 min
Interviewee H	Investment Manager	Telecommunications	Spain	40 min

Table 2. Overview of conducted interviews

An interview guideline was developed based on the research question (see Appendix B). To maintain comparability of results, interviews started with standardized questions. Background information was collected, followed by more open questions designed to answer the research question (McIntosh & Morse, 2015). More details on the interview content and structure will follow in Chapter 3.

3.2.2 Secondary data collection methods

The secondary data source used in this study was the tracxn database. Tracxn is a privately owned Indian database platform started in 2013 containing one of the most complete and updated firm-level details on investors and invested companies. A cross-sectional dataset on investors within the category "Corporate VCs" was extracted from this platform. It contained 597 rows (CVC units) and several columns with descriptive variables of information. **An Excel spreadsheet was used to collate relevant units for quantitative analysis** (see Figure 2).

First, a filter was applied to *exclude 414 rows* that did not contain units with headquarters in Europe. To ensure that all undesired rows were eliminated, the researcher manually went through the dataset and *eliminated two more rows* with non-European headquarters CVCs.

Second, the researcher manually *eliminated 11 rows* that contained units with governmental or investment companies as parents. This research focuses on the CVC activities of companies that are acting under a profit-maximizing rationale and which do not have any kind of investment activity as their core business. **Third**, the researcher manually *eliminated nine rows* that contained corporate accelerator and startup programs as well as family offices, which are not the subject of this work. **Lastly**, *eight CVCs were excluded* since they were not actively operating anymore. **The result was a sample dataset of 153 active CVC units with European headquarters and parent companies that are not governmental institutions or investment companies.**

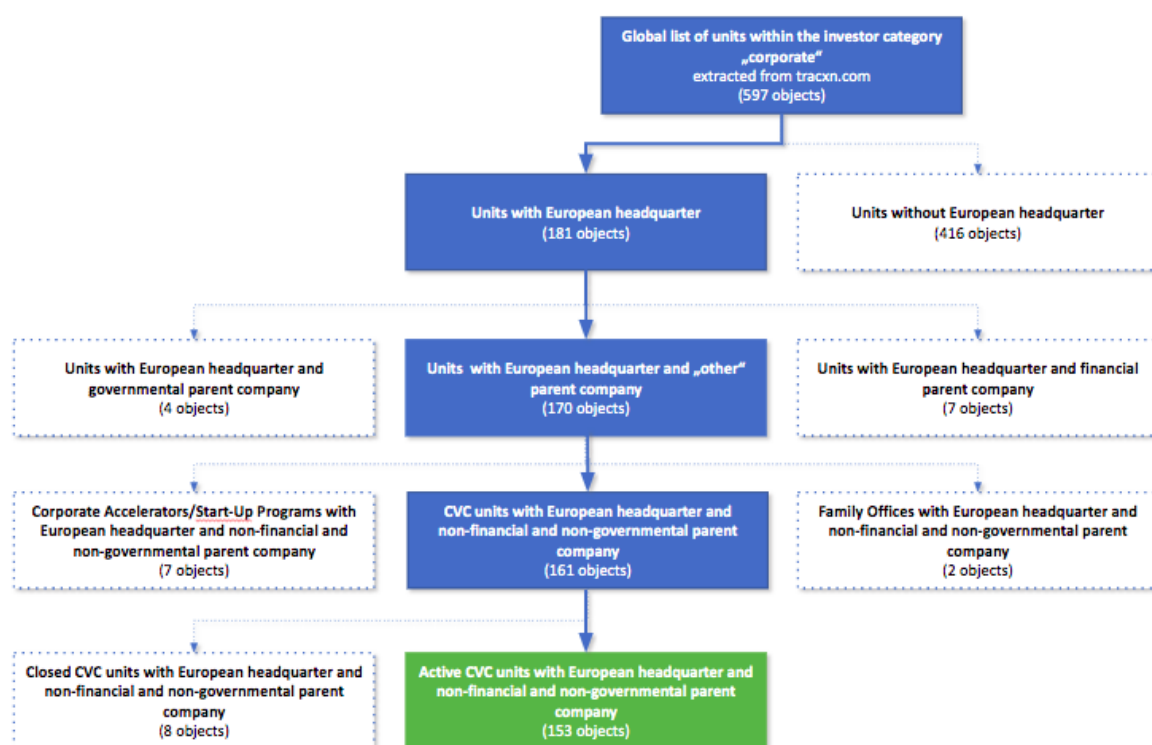


Figure 2. Secondary data collection process

To answer the RQ, the data sample was enriched by the explanatory variable “organizational structure” which was collected for each CVC unit provided in the secondary data sample. The variable is categorical (subsidiary or business unit) and reflects structural autonomy. The information was mainly conducted through the website lei.direct. Most CVCs that are subsidiaries were listed there. In cases of doubt, a double-check was made via press releases and the CVC websites.

To enable accurate analysis, 37 actually suitable CVC units were eliminated from the sample since they had missing values in all explanatory variables. **This led to a secondary data sample ready for analysis consisting of 116 units described by 10 independent variables.**

3.3 Data analysis methods

3.3.1 Quantitative data analysis

For quantitative analysis, the statistical software R studio was used. The goal was to answer the RQ: “Does structural autonomy influence portfolio performance?”. First, the data sample was prepared for analysis. Then, summary statistics and regression analysis were performed.

I. Sample preparation

The following paragraph describes adjustments made to the data sample. First, three new variables were created including the dependent variable “exit_ratio” as a measure of FPP and the two controlling variables “active_years” and “investments_pa”. For variable description see Appendix A Figure A1.

Additionally, the sample was reduced with rows containing CVC units with less than five years of history excluded. This respected the notion of four years as the average time to exit (Amor and M. Kooli, 2020). Thus, only units that have been active long enough to bring about an exit were considered. **The resulting data sample consisted of 104 European CVC units.** For a full view on the variables provided, see Appendix A, Figure A1.

II. Sample analysis methods

First, **means** were interpreted. A **t-test** was performed to check for a significant relationship between structural autonomy and FPP. A **regression analysis** was also performed. Several **ordinary-least-square regression** models including different control variables were conducted (OLS regression). The most accurate OLS regression model according to adjusted R² is shown in Figure 3. See the associated OLS regression output in Appendix A, Figure A3.

$$Exitratio = \alpha + \beta_1 \times organizationalstructure + \beta_2 \times portfoliocount + \beta_3 \times seed + \beta_4 \times activeyears + \beta_5 \times adjacentinv + \mu$$

Figure 3. Regression model

Several checks were performed to determine the appropriateness of using linear regression. These included homoskedasticity, normality, and multicollinearity assumptions (see details in

Appendix A, Figures A4 to A6). In fact, since the dependent variable “exit ratio” is a proportion, showing values between 0 and 100%, the better alternative to OLS is a general linear model (glm) with a **logistic regression** (Papke and Wooldridge, 1996). This regression type is used to describe proportional data since it does not asymptote at 0 or 1 like an OLS (straight-line) model.

The results of the logistic regression on the model in Figure 7 were then used to calculate **marginal effects** for the correct interpretation of the relationships between organizational structure and exit ratio of European CVC units.

3.3.2 Qualitative data analysis methods

The qualitative data derived from expert interviews were coded and structured according to critical topics identified during the interviews. For this purpose, a coding guide was developed for each topic to quickly identify patterns, distributions, and relevance of specific topic categories, relying on Phillip Mayring’s (2000) qualitative content analysis framework. For details of this see Appendix C. The insights structured by key topic categories were analyzed and processed. Since anonymity was granted to all interviewees, all statements, quotes, and insights gained have been anonymized, and letters were assigned to the interviewees (each representing a distinctive CVC unit).

4. RESULTS

This section is divided into three sections. First, quantitative analysis and interpretation of the dataset amplifies previously acquired knowledge and aims to validate the posited hypotheses. In the second section, qualitative data gathered through semi-structured expert interviews are analyzed. The last section (discussion) concludes by combining quantitative and qualitative results and revisits secondary material from academic literature.

4.1 Results of quantitative analysis

First, summary statistics were interpreted to become familiar with the data sample. Next, a regression was conducted to test H1: *Structural autonomy has a significantly positive influence on financial portfolio performance.*

4.1.1 Descriptive Statistics

Figure 4 shows summary statistics of the data sample, including 104 European CVCs with at least five years of activity. The sample includes 42 business unit CVCs (40.4%) and 62 subsidiary CVCs (59.6%), reflected by the mean of the categorical variable “*organizational structure*”.

On average, the observed CVC units have a history of 11.3 years, with the oldest unit operating for almost four decades (SR One, the CVC subsidiary of GlaxoSmithKline, active in the UK and US).

The mean of portfolio counts has a very high standard deviation which means the observations are a high degree of variance from the mean. The considerable range of portfolio counts explains this observation. The range is from 1 to 248, including a severe outlier of one huge CVC in the dataset. The sample is very skewed to the right, with many small CVC units. Therefore, it is better to interpret the median to make assumptions about the average portfolio count. According to the median, the average portfolio is comprised of 11 companies.

With 76.9%, most CVC units invest exclusively in industries and business models adjacent to the corporate parent’s core business, reflected in the categorical variable “*adjacent_inv*”. This is comprehensible since past research found CVC activities are most effective for corporate innovation when investments target relative industries (Keil et al., 2008b). Furthermore, it can be stated that a significant majority of CVCs (81.7%) invest in early-stage startups, defined by Series A and B investment rounds where CVCs invest on average USD 20 million.

Regarding FPP, on average, CVC units show an exit ratio of 3.2% in their portfolio. This means that from all portfolio companies, on average 3.2% achieved an exit as of today.

Statistic	N	Mean	St. Dev.	Min	Median	Max
portfolio_count	104	25.942	40.813	1	11	248
seed	104	0.236	0.253	0.000	0.155	1.000
early	104	0.581	0.229	0.000	0.601	1.000
late	104	0.164	0.202	0.000	0.095	1.000
average_round_size_usd	102	20,392,435.000	44,227,755.000	178,243.000	11,762,052.000	432,259,127.000
active_years	104	11.346	6.849	5	9	37
exitratio	104	0.343	0.210	0.000	0.299	0.875
subsidiary	104	0.596	0.493	0	1	1
business_unit	104	0.404	0.493	0	0	1
adjacent_inv	104	0.769	0.423	0	1	1
non_adjacent_inv	104	0.231	0.423	0	0	1

Figure 4. Summary statistics

Comparing the two sub-samples of subsidiaries and business units in Figure 5 one can state that, on average, subsidiaries show a 32.9% lower exit ratio in their portfolios than business units with 36.2%. Furthermore, subsidiaries have two more portfolio companies in the median. Regarding years of activity, it shows no difference. Both sub-samples are, on average, 11 years.

factor <fctr>	av_exitratio <dbl>	av_portfolio_count <dbl>	av_active_years <dbl>
subsidiary	0.3296293	12	11.27419
business_unit	0.3622017	10	11.45238

Figure 5. Averages of exit ratio, portfolio count and active years for business units and subsidiaries

A first **significance test** shows that with a $p\text{-value} > 0.05$, we can assume with a confidence level of 95% that there is no significant difference in exit ratios for subsidiaries and business units (Figure 6).

```

Welch Two Sample t-test

data: exitratio by subsidiary
t = 0.74619, df = 76.368, p-value = 0.4578
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -0.05436099  0.11950579
sample estimates:
mean in group 0 mean in group 1
  0.3622017      0.3296293

```

Figure 6. T-test for differences in organizational structure regarding exit ratio

4.1.2 Regression Analysis

The goal of regression analysis is to understand the influence of structural autonomy by comparing the FPP in terms of the exit ratio of subsidiary CVCs and business unit CVCs.

The visualized marginal effects of logistic regression show that **there is no significant effect on the exit ratio whether a subsidiary or a business unit while keeping the controlling variables constant** (Figure 7). With subsidiaries reflecting high SA, and business units reflecting low SA, **H1 can be rejected**. There is no significant effect of SA on a CVC units' exit ratio affecting FPP.

```
logitmfx(formula = out.logit, data = dt.cvc, atmean = FALSE)
```

Marginal Effects:

	dF/dx	Std. Err.	z	P> z
factor(organizational_structure)subsidiary	-3.2015e-02	9.4807e-02	-0.3377	0.73560
active_years	4.2578e-03	6.9913e-03	0.6090	0.54252
portfolio_count	7.9505e-04	1.4309e-03	0.5556	0.57847
seed	3.8021e-01	2.1619e-01	1.7587	0.07863
average_round_size_usd	-1.0163e-09	1.8735e-09	-0.5425	0.58748

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1				

Figure 7. Marginal effects

Additionally, the results show that **the stage of the startup invested in** plays a role for FPP. With a confidence of 90% it can be assumed that the proportion of investments in seed stage have a positive effect on the exit ratio within a portfolio. More precisely, increasing seed investment proportion by 1 percentage point increases the exit ratio by 38 percentage points, ceteris paribus.

Summarized, the results of the quantitative analysis show that even though there exist two distinctive groups of CVCs in Europe that can be separated by their SA, the two groups do not show a significant difference in FPP in terms of exit ratios. **Structural autonomy coming from the organizational structure of a CVC unit does not seem to influence exit ratios.**

To better understand which dimensions of autonomy exist next to SA and which mechanisms can drive FPP, it is crucial to gain qualitative knowledge from practitioners. This was the aim of the semi-structured expert interviews qualitatively analyzed in the next section.

4.2 Results of qualitative analysis

This section serves to consolidate and analyze the results of the eight semi-structured expert interviews. The qualitative analysis aims to understand dimensions and influential mechanisms of CVC autonomy.

Every interview consisted of four parts: The first part collected basic information on the CVC unit (e.g., team size, years of activity, investment focus). The second part served to understand how the CVC unit defines objectives and measures performance, especially towards weighting strategic vs. financial objectives. The third part assessed the autonomy level perceived by the interviewee to learn how they evaluated the relationship with the corporate parent. The last part combined the autonomy discussion with FPP to understand how the autonomy level influences the CVC FPP. For a detailed interview guide and summary of key insights, see Appendix B.

The qualitative research results are structured in six sub-chapters. First, *general information* is provided on the CVC units observed. Afterward, the key variable of this study is analyzed: The *CVC autonomy*. Then, *CVC unit objectives and value-adding mechanisms* for corporate parents and portfolio companies are discussed. Here, deviations regarding different autonomy levels will be analyzed.

It is essential to mention these conclusions do not represent statistically significant results but serve as an overview and visualization of qualitative insights from the semi-structured expert interviews.

4.2.1 General Information

Table 4 summarizes the semi-structured interviews, contextualizing the interview insights. The sample includes three corporate business units and five subsidiaries. The sample ranged from very young units with small teams to already established units with larger teams. All units older than two years had experienced exits in their portfolios (A, C, D, E, G, H).

	A	B	C	D	E	F	G	H
Country	Germany	Spain	Germany	Netherlands	France	UK	Germany	Spain
Organizational Structure	Subsidiary	BU	BU	Subsidiary	Subsidiary	BU	Subsidiary	Subsidiary
Years Operating	9	2	7	4	5	2	9	11
Team Size	15	4	20	9	8	4	17	14
Portfolio Count	20	1	16	19	27	2	32	198
Portfolio Exits	3	-	1	2	13	-	4	21

Table 3. General overview of observed CVCs through expert interviews

4.2.2 Structural and investment decision-making autonomy

Results of qualitative research showed that the overall autonomy of a CVC unit depends on dimensions that go beyond SA. This section provides insights on how autonomy is defined and assessed by the experts.

I. Structural autonomy and autonomy in operational decision-making

Figure 8 displays overall autonomy levels distinguished by organizational structure. As noted before, five out of eight units operate as a subsidiary of the corporate parent (A, D, E, G, H). This observation is aligned with the results of the quantitative analysis, showing a clear tendency to separate CVC units from the core business. According to the experts, the main reason for this is to enable CVC managers to implement more lean processes instead of corporate processes when it comes to administrative tasks, brand building, hiring, and other aspects concerning business operations. This suggests that SA promotes VA: CVC units with higher SA (subsidiaries) seem to have more freedom in operational decision-making, thereby being more autonomous of corporate executives to whom they report (Hill et al., 2009). Ultimately, these insights align with agency theory stating that especially in dynamic, changing environments like the field of innovation and venture capital, principals tend to grant more autonomy to managers able to respond to their environments (Yang, 2012; Eisenhardt, 1989).

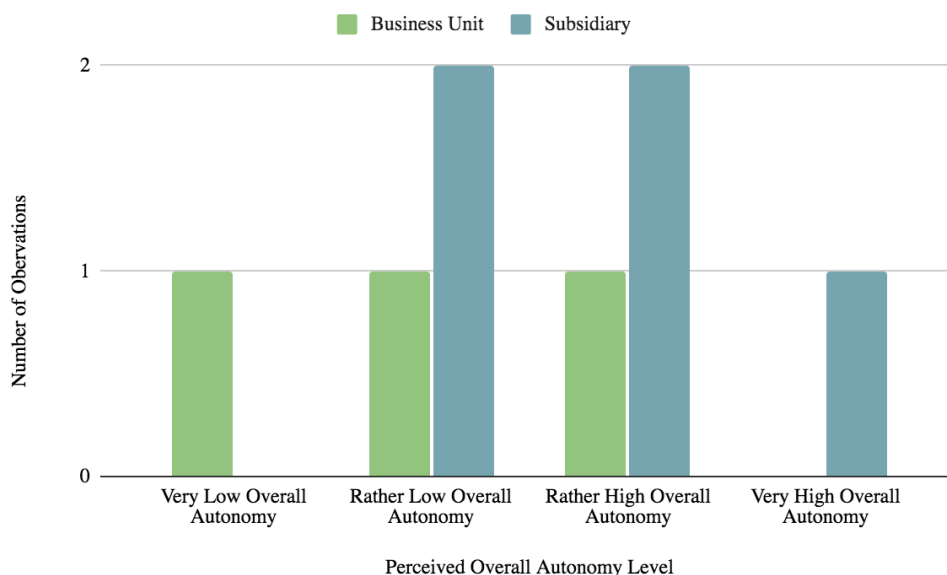


Figure 8. Perceived overall autonomy level by organizational structure

Furthermore, according to Figure 8, with three out of five subsidiaries, there is a tendency to perceive higher OA by subsidiary CVCs (A, D, G). Interviewee C was an exception here. This

CVC has a relatively high level of overall autonomy while having low SA being a BU. On the other hand, two out of five subsidiary CVCs show lower OA while having high SA (E, H). The findings suggests that other factors may influence overall autonomy besides organizational structure. In the context of quantitative research results, this results suggests that while SA alone does not influence FPP, other dimensions of autonomy do. The experts support this assumption. Interviewees held that organizational structure does not seem to be the deciding factor for overall autonomy levels of CVC units. As one of the experts stated, *"There is no black and white when it comes to CVC autonomy. Being a subsidiary or a business unit can influence important topics like administrative processes, compensation, and incentives (business operations). However, in the end, it does not decide on the actual autonomy level"* (Interviewee C, Appendix B).

II. Investment Decision-Making Autonomy

When asked to describe the CVC unit's overall autonomy level, all interviewees mentioned that autonomy is significantly driven by freedom in *investment decision-making*. This is consistent with academic literature which states that the key characteristics of vertical and horizontal decision-making autonomy are freedom in deciding on investments and portfolio management (Hill et al., 2009). According to Figure 9, 50% of observed CVCs perceive relatively high investment decision-making autonomy (IDMA). **Three out of five CVCs with high structural autonomy also tend to show higher investment decision-making autonomy suggesting a slightly positive relationship between these dimensions of overall autonomy.**

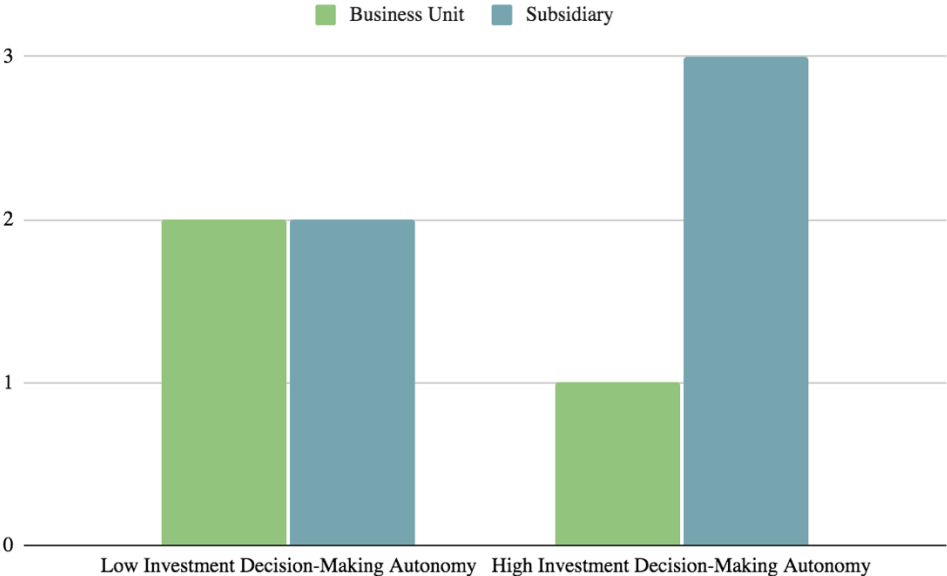


Figure 9. CVC unit investment decision-making autonomy by organizational structure

Qualitative research suggests that two dimensions influence IDMA: First, the level of decision-making power of corporate executives pertaining to the *investment process*, and second investment selection reflected in CVC's *investment criteria*.

Two aspects characterize investment processes described by those perceiving higher IDMA: First, the ability to make investment decisions independently from the IC (which always includes corporate executives) as long as it fulfills agreed investment criteria. Two out of four CVCs with high IDMA do not need permission to invest, while the other two do not need permission for smaller investments (mainly up to USD 1 million). In contrast, the three CVCs with lower IDMA need the IC's permission for every investment. The second characteristic of investment process in regards to IDMA is the composition of the IC. For the four CVCs with lower IDMA, the IC consists solely of corporate executives, increasing dependency on the corporate parent. For the higher IDMA CVCs interviewed, the IC is a mix of corporate stakeholders and CVC unit managers, granting more power to the CVC unit itself, decreasing overall dependency on the corporate parent. **Ultimately, the CVCs with higher IDMA show increased vertical autonomy.**

Regarding investment criteria, the second dimension of IDMA, there are two main findings: First, all units with relatively high IDMA do not need buy-in from a business unit for an investment. For lower IDMA CVCs, two out of four need the buy-in. This criterion is experienced as very limiting when it comes to investment selection, and experts state it is time-consuming, thwarting their CVC activities. In the words of an expert: *"There were investments that would have made us rich, but we could not go for it because no corporate BU gave us buy-in or we were just too slow in receiving the buy-in on time"* (Interviewee B, Appendix B). The second finding regarding investment criteria of higher IDMA CVCs concerns the definition of strategic fit. It was stated earlier that the great majority of CVCs pursue strategic goals. Correspondingly, all eight interviewees stated that there should be at least some strategic fit between the investment and the corporate parent's business or at least one corporate business unit. Qualitative research shows that this criterion's design and tolerance for deviations characterizes the difference between higher and lower IDMA CVCs. For example, interviewee D, who experienced very high IDMA, stated that even though there should always be a link to the insurance industry, this link can be very loose and indirect and is open to interpretation for

every potential investment. Meanwhile, interviewees B, F, E and H with lower IDMA state that the strategic link to the corporate business has to be rather obvious and proven. **Summarized, the CVCs with higher IDMA show higher horizontal autonomy.** Figure 10 summarizes the above findings of how IDMA is defined according to qualitative research.

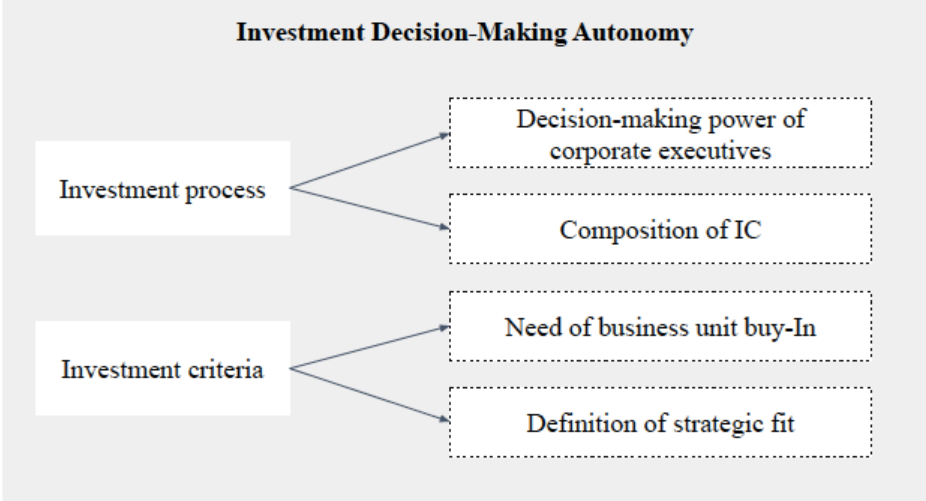


Figure 10. Mechanisms of investment decision-making autonomy

III. Autonomy as a function of time

Another insight from the qualitative research was that gaining autonomy as a CVC unit seems to be a matter of time. Four out of five CVCs with higher overall autonomy state that reaching the freedom they have today in organizational and investment decision-making was a journey (A, C, D, H). They stated that autonomy was developed by gaining the trust of the corporate parent towards the CVC unit and its activities over time. These relatively autonomous CVCs operated for at least four years, while two out of the three less autonomous CVCs are very young, with less than two years of activity.

4.2.3 CVC Objectives

Qualitative research showed that most pursue strategic goals independently of their organizational structures (seven out of eight, see Figure 12). Only one out of nine CVCs focuses on purely financial KPIs. This result is consistent with past research stating that what the majority of CVCs have in common is their strategic motivation for investing (Chesbrough, 2002; Dushnitsky and Lenox, 2005; Maula and Murray, 2002; Rind, 1981). Additionally, the majority pursue strategic and financial goals (five out of eight). Only two CVCs pursue purely strategic goals. This is consistent with academic literature (Gompers and Lerner, 2000) and the

Silicon Valley Bank Report from 2021 stating that CVCs care about financial performance more than strategic goals.

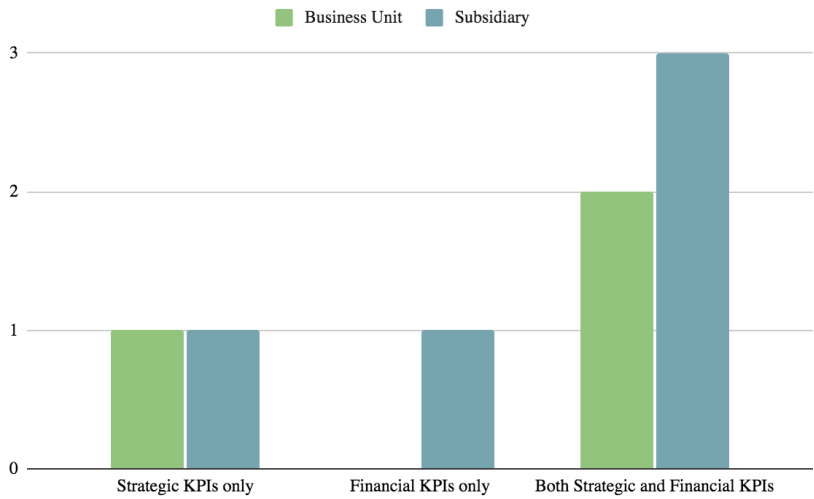


Figure 11. Distribution of CVC objectives according to qualitative research

The five CVCs that track financial goals, all cited the same KPIs. They rely on the classic financial venture capital measures IRR and MOIC. This is consistent with the findings of Gompers and Lerner (2000) that corporate investors seek financial returns through liquidity events at high valuations, such as initial public offerings (IPOs) or sales of portfolio companies to third parties, just as independent venture capitalists do.

4.2.4 CVC Value Add

As pointed out in the theoretical discussion, CVCs add value to both the corporate parent and the companies they invested in (portfolio companies). The following analysis describes CVC value add mechanisms for both parties.

I. I. CVC Value Add for the Corporate Parent

Overall, analysis of CVC value-adding mechanisms for the corporate parent shows that CVCs create value mainly by supporting ambidextrous activities (Table 4). This is consistent with past research on CVCs acting as vehicles for building dynamic capabilities (Chesbrough, 2002; Dushnitsky and Lenox, 2005; Maula and Murray, 2002).

Added Value: Corporate Explorative Activities	Added Value: Corporate Exploitive Activities
<ul style="list-style-type: none"> • Awareness for industry and technology trends • Awareness for new strategies 	<ul style="list-style-type: none"> • Networking: Identify new business partners or suppliers

<ul style="list-style-type: none"> ● Identification of potential future synergies to support future corporate business and strategy ● Access to new technologies and business models ● Access to new markets 	<ul style="list-style-type: none"> ● Learning: Learn new ways of working to support corporate organizational development ● Collaborating: Support corporate product innovation and R&D by collaboration ● Brand building
---	---

Table 4. Value Add of CVCs for the Corporate Parent

Value add for *explorative activities* mainly aim at two things: First, creating awareness for developments in the industry. CVCs seek to know about new technologies, changing strategies, and emerging business models potentially relevant for their future business. Second, gaining access to these new technologies, business models, or even whole new markets potentially relevant for the corporate's future. As interviewee A said: "*There is a fear of getting disrupted by new players, which is why incumbents want to have their "skin in the game" early on*".

Value add for *exploitive activities* described in the interviews shows four fundamental mechanisms supporting current corporate business: The first and most relevant mechanism, according to interviewees, is collaboration on product innovation, performing joint product development, and supporting internal R&D teams. Another mechanism is networking. Direct investments in startups open up new networks helping to identify potential new business partners. Third, is about learning. For instance, the exchange with portfolio companies regarding new ways of working can support corporate organizational development. The last mechanism mentioned in the interviews is brand building: As noticed in the introduction, CVC seems to be a trend of the past years, with activities increasing year by year. According to interviewees, firms expect to be perceived as modern and innovative when positioning themselves as investors and supporters of startups.

II. II. CVC Value Add for Portfolio Companies

CVC units add value to their portfolio companies in several congruent mechanisms mentioned by the interviewees. This finding is in line with academic literature stating that significant "smart capital" exists beyond financial support provided by CVCs to startups (Battistini, Hacklin and Baschera, 2013; Large and Muegge, 2008; Maula, 2001). Based on qualitative research, there is no observed difference in smart capital mechanisms dependent on the organizational structure of the CVCs.

Value Add Mechanisms	Details
Venture Capital Expertise	<ul style="list-style-type: none"> ● Fundraising Support ● Business Planning Support ● Hiring Support
Access to Corporate Resources	<ul style="list-style-type: none"> ● Access to Technology and Industry Knowledge ● Access to Network: Customers, Partners, Suppliers
Collaboration	<ul style="list-style-type: none"> ● Pilots ● Partnerships ● Co-Development
Brand Building	<ul style="list-style-type: none"> ● Credibility and Reputation of Corporate Brand

Table 5. CVC value adding mechanisms for portfolio companies

Four mechanisms could be identified throughout the interviews. First, just like IVCs, CVCs support their portfolio companies with *expertise related to venture capital*. They aim to help the startups in operational and strategic matters, including future fundraising, business planning, and hiring. Second, it is about *access to corporate resources* like technology and industry know-how and a corporate network including customer base, partners, or suppliers. Third, just like corporations *benefit from collaboration* with startups, startups themselves benefit. Often, they get the chance to run pilots with corporate business units, develop long-term partnerships and co-develop their products with corporate teams and experts. Lastly, just like the corporate brand benefits from supporting startups and acting as a venture capital investor, startups can *benefit from the credibility* and reputation of the corporate brand, called reputation spill-over.

4.2.5 Conclusion

Insights on CVC unit autonomy, CVC objectives, and value add constitute knowledge that can be used to better understand how CVC units operate, how different autonomy dimensions are interrelated and which mechanisms of autonomy influence portfolio performance. The following discussion will merge all these insights.

5. DISCUSSION AND CONCLUSION

5.1 Discussion

With respect to the increasing appearance of CVC and its relevance as startup funding source, this work aims to establish an understanding for the influence of CVC unit autonomy on the

financial performance of CVC-backed startups (portfolio companies). Autonomy levels vary tremendously among CVC units (Yang, 2012; Lee, Park, and Kung, 2018, Hill et al., 2009). Therefore, it is important for incumbent firms to understand autonomy dimensions and their implications when setting up units. To this end, financial portfolio performance of CVC units distinguished by their structural autonomy (SA) was compared by quantitative methods. Furthermore, different dimensions of overall autonomy (OA) and their connections have been identified based on academic research and qualitative research in this work. **Ultimately, an overview of mechanisms influencing portfolio performance based on the level of autonomy is provided.**

5.1.1 Structural autonomy and portfolio performance

A critical aspect when setting up a CVC unit is the decision on SA that comes with organizational structure. CVC units are often set up as separate legal entity in form of a wholly-owned subsidiary. Other CVC units are set up as a corporate business unit and not structurally separated from the firm. Therefore, subsidiaries have high SA and business units have low SA. Past research showed that CVC units add value to CVC portfolio performance in terms of exits and valuations by providing smart capital (e.g. access to industry and technology knowledge, venture capital expertise) (Ivanov and Xie, 2010; Gompers, 2002; Gompers and Lerner, 2000). Expanding this research, quantitative results suggest that the extent of this value add is not significantly influenced by SA of the CVC units performing the investments. This result aligns with the insights from expert interviews. On one hand, CVC units with high SA (subsidiaries) showed higher investment-decision-making autonomy (IDMA) and IDMA is positively correlated with FPP according to academic literature (Yang, 2012; Hill et al., 2009). On the other hand, experts stated that being a subsidiary alone does not significantly influence their ability to support portfolio companies' performance.

Furthermore, the results are in line with academic research on structural autonomy on dimensions of corporate innovation performance: Past research states that SA is positively correlated with explorative innovation activities, while negatively correlated to exploitation activities (Lee, Park, and Kung, 2018). As stated above, qualitative research found that CVC units with higher SA have a tendency to higher IDMA. IDMA means autonomous investment processes and more flexible investment criteria. This supports explorative activities by broadening the pool of investment options to consider. On the other hand, flexible investment criteria with no buy-in from corporate BUs and less decision-making power of corporate

executives within the investment process can lead to investments in startups less strategically valuable to the corporate today, and therefore less exploitation potential for existing business.

5.1.2 Overall autonomy framework

To better understand overall autonomy, this work provides a framework derived from academic literature and qualitative research, combining all discussed dimensions of autonomy.

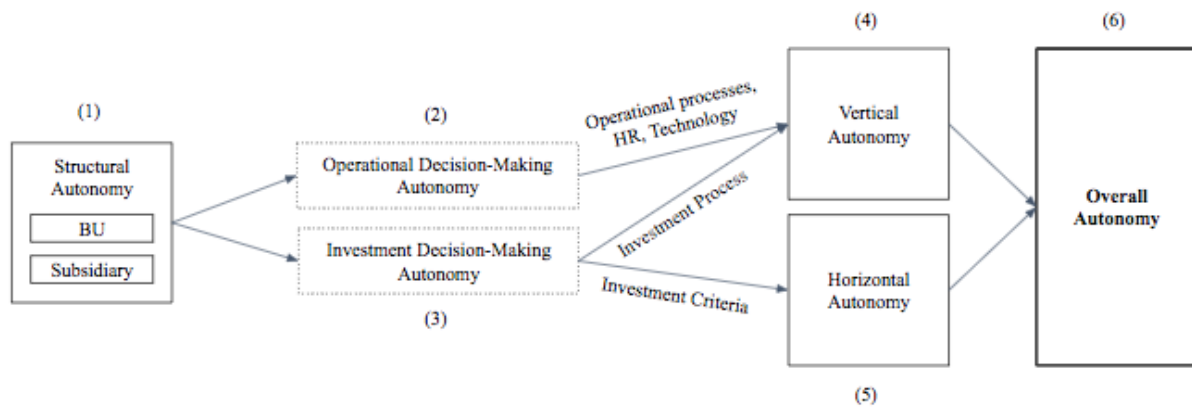


Figure 12. Framework: Observed dimensions of CVC unit overall autonomy

The academic research shows that vertical and horizontal autonomy drive overall autonomy of CVC units. VA hereby is the autonomy in decision-making from the ones a CVC unit reports too (corporate executives). HA is the autonomy in decision-making from managers of other, co-existing corporate business units and subsidiaries (Hill et al., 2009). This work supports academic literature on CVC autonomy by identifying and demonstrating the mechanisms influencing VA and HA connected to SA (Figure 11).

For the CVCs observed in qualitative research, SA seems to positively influence the autonomy in operational and investment decision-making. Operational decisions hereby include all decisions related to HR, technology and processes that keep the CVC unit up and running. Investment decisions include all decisions related to the business purpose of CVC units (where and when to invest). This work's research showed that high SA (as for subsidiaries) positively influences autonomy in operational and investment decision-making (IDMA), which again pays into VA and HA by decreasing the dependency on corporate executives and other business units. VA and HA positively influence overall autonomy, which again is positively correlated with FPP (Yang, 2012; Hill et al., 2009). **This framework can be used to explain the insignificant direct relationship between structural autonomy and financial portfolio performance derived from quantitative research by assessing SA as influential, but not solely decisive dimension of overall autonomy.**

5.1.3 Overall autonomy and mechanisms of portfolio performance

The ultimate goal of this work is to examine the relationship between CVC unit autonomy and financial portfolio performance, since FPP is an important KPI for CVC units. The combined knowledge on CVC autonomy, value-add and objectives gained in qualitative research is used to derive an overview on advantageous mechanisms for FPP. Interviews showed that the extent to which a CVC unit can apply those mechanisms depends on its level of autonomy. Table 6 below provides an overview of all mechanisms identified, and analyzed by the ability of application for low and high autonomy CVC.

	Advantageous Mechanisms for FPP	High Overall Autonomy	Low Overall Autonomy	
1	Internal processes adapted to CVC unit needs	3	3	
2	Corporate-Independent investment process	2	1	
3	Fast investment process	3	1	
4	Flexible investment criteria	2	1	
5	Unconditional long-term commitment possible	3	1	
6	Strong knowledge-transfer	2	3	
7	High level of collaboration	2	3	
8	Highly informed investment selection	2	3	
9	Reputation spill-over	3	3	
	Total	22	19	
		<i>1 = Hardly applicable</i>	<i>2 = Average applicable</i>	<i>3 = Highly applicable</i>

Table 6. Application of mechanisms beneficial to portfolio performance based on overall autonomy level

Table 6 indicates that mechanisms benefiting FPP tend to be more applicable for CVCs with higher overall autonomy levels. This is consistent with academic research establishing a positive relationship between CVC unit autonomy and FPP (Yang, 2012; Hill et al., 2009). Furthermore, it aligns with agency theory which states that especially in dynamic environments, higher autonomy granted to agents is beneficial since costs of monitoring are too high (Eisenhardt, 1989; Yang, 2012). The fact that there are beneficial mechanisms for high and low autonomy is consistent with academic literature showing different arguments for and against high autonomy in CVC units. The improved selection effect, knowledge transfer mechanisms and degrees of collaboration in low autonomy CVCs seems to be valuable for portfolio performance as well (Chemmanur, Loutskina and Tian, 2015; Ivanoc and Xie, 2010; Yang, Narayanan and Zahra, 2009; Dushnitsky and Lenox, 2005a). **In summary, there are**

beneficial mechanisms for portfolio performance, some better applied by CVCs with low autonomy and some better applied by CVCs with high autonomy. And there is an overall tendency to high autonomy CVCs better applying beneficial mechanisms.

In addition, this overview indicates that the managerial decision for high or low autonomy levels depends on the objective prioritization of the corporate parent. Five of the nine identified beneficial mechanisms support FPP and explorative activities of the corporate parent, while rather harming exploitative activities of the corporate parent (1 to 5). On the other hand, mechanisms six, seven and eight support FPP and exploitive activities. **This suggests, that even though higher levels of autonomy tend to show higher FPP, a firm mainly pursuing exploitative activities may establish lower levels of autonomy.**

5.2 Conclusion and managerial implications

The subject of this work is the corporate venture capital (CVC) industry focusing on Europe. More precisely, this work has investigated how structural autonomy (SA) of CVC units from the incumbent firm they belong to affects financial performance of invested companies (FPP). CVC units are business units (BUs) or separate subsidiaries that manage CVC investments on behalf of incumbent firms. SA is one dimension of a CVC units' overall autonomy (OA), defined by the organizational structure of CVC units. Subsidiaries have high SA and business units have low SA (Lee, Park, and Kung, 2018). Furthermore, FPP was measured as exit ratio: the number of portfolio companies that were able to realize a liquidation event (exit) in relation to the total number of portfolio companies. This work consists of quantitative and qualitative data to answer the RQ: *"Does CVC structural autonomy influence portfolio performance?"*.

Quantitative research was performed on secondary data of European CVC units obtained from traxn.com, a privately owned database platform. The influence of CVC units SA on the exit ratio was investigated by t-test and regression analysis. Furthermore, qualitative primary data was gathered through expert interviews. Thereby, insights on autonomy dimensions and mechanisms influencing FPP were conducted. The researcher interviewed eight experts working for different European CVC units in five countries, including subsidiaries and BUs. Therefore, providing robustness to the results and different perspectives.

Academic literature on OA has shown, higher OA of CVC units positively influences FPP. OA is hereby defined by two dimensions: vertical autonomy (VA) referring to autonomy relative to the ones the CVC unit reports. And horizontal autonomy (HA), referring to autonomy relative

to other corporate BU managers (Yang, 2012; Hill et al., 2009). Moreover, SA, as third dimension of OA, positively influences strategic performance of the corporate parent by improved explorative innovation (Lee, Park, and Kung, 2018). Agency theory supports all of the above findings, stating that principals (corporate parents) should grant higher OA to their agents (CVC units) in dynamic environments like innovation. This is explained by high monitoring costs and the flexibility in decision-making needed in these environments (Yang, 2012; Eisenhardt, 1989).

However, the literature also showed advantages of lower OA and SA in terms of reduced information asymmetry and increased corporate exploitive innovation. First, CVC units with low OA levels showed improved knowledge transfer mechanisms, beneficial for incumbent firms and portfolio companies (Chemmanur, Loutskina, and Tian, 2015; Ivanoc and Xie, 2010). Second, lower SA is positively correlated with exploitive innovation of incumbent firms, supporting existing business (Lee, Park and Kung, 2018). Summarized, the literature supports arguments for high and low OA and SA in CVC units which raises the relevance of autonomy considerations for decision makers.

While Lee, Park and Kung (2018) found that CVC unit SA significantly influences corporate strategic performance, quantitative research of this work showed no significant relationship between SA and FPP. H1: *Structural autonomy has a significantly positive influence on financial portfolio performance*, was neglected.

Furthermore, qualitative results support the agency theory: Pros and cons of granting higher autonomy to the agents (CVC units) were identified. A majority of the experts (75%) stated that higher OA leads to more flexibility and speed of investment activities, implicating improved adaption to the dynamic environment. In contrast, experts working for lower OA CVCs stated that the knowledge transfer and investment selection is improved through the demanded corporate involvement. This speaks for reduced information asymmetry (Yang, 2012; Eisenhardt, 1989).

In addition, results support academic literature on autonomy and FPP, stating VA is positively influencing FPP (Hill et al., 2009). Seventy five percent of experts also stated that VA influences their ability to support portfolio companies fast and reliably. Experts describe high VA by low decision-making power of corporate executives in the investment process. Furthermore, qualitative research builds on the research of Hill et al. by drawing a connection between SA and VA. More precisely, SA positively influences VA according to 60% of

subsidiary CVC units, especially by enabling independent operational decisions adapted to the units' needs.

Ultimately, qualitative research identified nine autonomy-dependent mechanisms beneficial to FPP. While five mechanisms are more applicable for CVC units with high OA, three mechanisms are more applicable for low OA CVC units. This aligns with the past finding on higher OA positively influencing FPP and expands this by explaining mechanisms (Yang, 2012; Hill et al., 2009). Lastly, the identified mechanisms implicate, the appropriate level of OA for CVC units seems to depend on the objectives of the corporate parent: Those mechanisms in favor of low OA tend to benefit corporate exploitive innovation, while high OA mechanisms tend to benefit explorative innovation.

In sum, this work may help CVC decision makers understand the implications of structural autonomy, supporting them to choose the right organizational structure for their CVC units. In addition, the overview on different mechanisms beneficial for FPP may help them to design the overall autonomy level in detail. Ultimately, the results highlight that decision makers must be clear of their objectives when deciding on CVC unit overall autonomy.

6. LIMITATIONS AND FURTHER RESEARCH

Three main limitations must be considered. First, there was no guarantee of complete and up-to-date data. Second, it is not possible to posit a causal relationship between structural autonomy and financial portfolio performance due to the nature of data. The data provided does not allow for a differences-in-differences regression needed to capture the differences in exit ratios for business units that became subsidiaries in a certain point in time compared to those who stayed business units all the time.

Another concern is the generalizability of results due to the geographical focus. The finding of a non-significant relationship between structural autonomy and exit ratios may not generalize to other areas beyond Europe. The literature on autonomy in U.S. states that subsidiary CVCs with high structural autonomy also show very high overall autonomy (OA). (Lee, Park, and Kung, 2018). In contrast, qualitative research found that only 20% of observed subsidiary CVCs showed very high OA. This leads to the assumption that European incumbent firms perhaps do not provide as much autonomy to their CVC units as U.S. firms do. Further research should be conducted on the differences of autonomy and portfolio performance in European and U.S. CVC industries.

The researcher came across another interesting field for additional research. While this work concludes high autonomy CVC units deploy mechanisms beneficial to FPP better than low autonomy CVC units, these mechanisms can be weighted differently according to the objectives of the corporate parent. Further research should be performed on autonomy and portfolio performance in light of a CVC unit's objectives and motivation.

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Appendix

Appendix A – Quantitative analysis

Variable Name	Data Type	Role	Description
Company_name	Categorical	Identifier	Reflects the units of analysis, counting 104 CVC units after data cleaning procedure
exitratio (created)	Numeric (proportional)	Dependent variable	Reflects financial portfolio performance in terms of number of exits in a portfolio in relation to total portfolio count
organizational_structure	Categorical (binary)	Explanatory variable	Reflecting structural autonomy, the value is either “subsidiary” (high structural autonomy) or “business_unit” (low structural autonomy)
portfolio_count	Numeric (discrete)	Controlling variable	Reflecting the size of a CVC units’ portfolio in total number of portfolio companies
investments	Numeric (discrete)	Controlling variable	Reflecting investment activity by total number of investments made (including follow-up investments in existing portfolio company)
investments_pa (created)	Numeric (discrete)	Controlling variable	Reflecting investment activity relative to years of activity
exits	Numeric (discrete)	Controlling variable	Reflecting financial portfolio performance as a total number of achieved liquidity events in a CVCs’ portfolio
seed	Numeric (proportional)	Controlling variable	Reflecting the proportion of investments made in seed stage startups
early	Numeric (proportional)	Controlling variable	Reflecting the proportion of investments made in early-stage startups (Series A and B)
active_years (created)	numeric (discrete)	Controlling variable	The age of the CVC unit by years of activity since founding year
late	Numeric (proportional)	Controlling variable	Reflecting the proportion of investments made in late stage startups (Series C+)
Average_round_size_usd	Numeric (continuous)	Controlling variable	Average total amount of the funding rounds a CVC participated

Table A1. Description of the sample data set

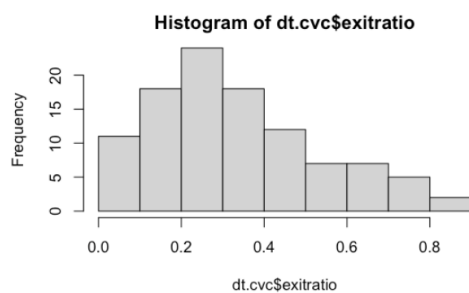


Figure A2. Distribution of exit ratios

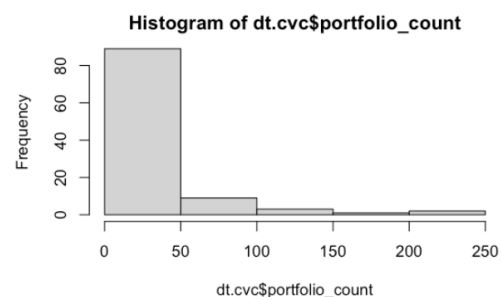


Figure A3. Distribution of portfolio count

Dependent variable:	

	exitratio

factor(Organizational_structure)subsidiary	-0.032 (0.037)
active_years	0.004 (0.003)
portfolio_count	0.001 (0.001)
seed	0.414*** (0.077)
average_round_size_usd	-0.000 (0.000)
Constant	0.209*** (0.051)

Observations	102
R2	0.273
Adjusted R2	0.236
Residual Std. Error	0.182 (df = 96)
F Statistic	7.225*** (df = 5; 96)
=====	
Note:	*p<0.1; **p<0.05; ***p<0.01

Figure A4. OLS regression results

studentized Breusch-Pagan test

data: lm.exitratio6
BP = 2.2847, df = 4, p-value = 0.6836

Figure A5. Breusch-Pagan Test, assuming H0: Model is homoscedastic

RESET test

data: lm.exitratio6
RESET = 0.62529, df1 = 2, df2 = 97, p-value = 0.5373

Figure A6. Ramsey test assuming H0: The model has the correct functional form (linear)

	portfolio_count	active_years	seed	early	late	average_round_size_usd
portfolio_count	1.00000000	0.08411490	-0.2488919	-0.05217676	0.3819134	0.60058830
active_years	0.08411490	1.00000000	-0.2327389	0.13581959	0.1319767	-0.06660704
seed	-0.24889190	-0.23273885	1.00000000	-0.63818600	-0.5122066	-0.26764609
early	-0.05217676	0.13581959	-0.6381860	1.00000000	-0.3046786	-0.16273435
late	0.38191342	0.13197670	-0.5122066	-0.30467857	1.00000000	0.52068530
average_round_size_usd	0.60058830	-0.06660704	-0.2676461	-0.16273435	0.5206853	1.00000000

Figure A7. Correlation matrix to check for multicollinearity (coefficient >0.8)

Dependent variable:	

	exitratio

factor(organizational_structure)subsidiary	-0.149 (0.440)
active_years	0.020 (0.032)
portfolio_count	0.004 (0.007)
seed	1.776* (0.931)
average_round_size_usd	-0.000 (0.000)
Constant	-1.244** (0.634)

Observations	102
Log Likelihood	-49.546
Akaike Inf. Crit.	111.092
=====	
Note:	*p<0.1; **p<0.05; ***p<0.01

Figure A8. GLM logistic regression results

Appendix B – Expert interview summaries

Topic	Question
Introduction	<ol style="list-style-type: none"> a. For how long are you working in the CVC? b. What is your role and main responsibilities?
General overview	<ol style="list-style-type: none"> a. Who is the corporate parent (name, industry)? b. Is the CVC unit a business unit of the corporate or a subsidiary? c. When was the CVC unit founded? d. How big is the CVC team (FTEs)? e. What is the CVCs investment focus? f. Portfolio count, exit count and unicorn count?
Performance measurement	<ol style="list-style-type: none"> a. What is the CVC’s most important goal (motivation)? b. What are the CVC’s KPIs? c. How are you balancing strategic and financial goals? d. Please describe how you define portfolio performance e. How do you as a CVC contribute to portfolio performance?
CVC autonomy level	<ol style="list-style-type: none"> a. How would you assess the level of autonomy your CVC has towards the corporate parent? (a) very low autonomy, b) rather low autonomy, c) rather high autonomy, d) very high autonomy) b. Please explain why you chose a certain level c. How do you experience the ties to the corporate in your daily work? d. How do you make investment selection and investment decisions?
Portfolio performance and autonomy level	<ol style="list-style-type: none"> a. How do you think your corporate parent influences your ability as CVC to do your job? b. How is your autonomy level influencing the performance of your portfolio / your ability to contribute to financial portfolio performance in terms of high valuations and likelihood for liquidity events?
Wrap Up	<ol style="list-style-type: none"> a. Is there anything else you would like to mention?

Table B1. Interview Framework

Topic	Key Insights
Introduction	<ul style="list-style-type: none"> ● Interviewee works at corporate since 10 years ● Had several roles within the corporate and switched to CVC unit 3 years ago ● In his role as Investment Manager he is responsible for sourcing, due diligence, KPI tracking and portfolio reporting

<p>General overview</p>	<ul style="list-style-type: none"> ● Corporate parent in special chemistry industry ● German-based globally acting corporate parent ● CVC unit is a wholly owned subsidiary, operating since 2013 ● 15 FTEs in CVC unit, US- and Germany-based ● Investment focus: globally, early-stage to later-stage, investing in pre-defined strategic growth areas of the corporate parent ● Investment type: Usually in syndicate, acting as co-investor. Sometimes acting as lead investor, but not preferred due to the responsibility that comes with it
<p>Performance measurement</p>	<ul style="list-style-type: none"> ● CVC objective: access to new technologies and business models, keeping up with trends and industry developments, brand building ● motivation: On paper, financial and strategic goals of investing are equal (50/50). In reality, there is a clear focus on strategic goals (easier to sell it to the IC) ● Investment criteria: Very strategically driven, there always has to be a corporate business unit sponsor willing to collaborate with the startup (e.g., pilots). Startups financial KPIs are still important for communication in front of the Investment Committee ● Financial motivation is gaining relevance though, plan is to become cashflow break-even to act like an evergreen fund without asking for new money ● Strategic KPIs: Collaboration agreement with BU's, revenue increase for corporate parent, cost reduction for corporate parent, potentially acquisition ● Financial KPIs: Internal rate of return (IRR), Multiple on invested cash (MOIC) ● incentives to pursue financial goals: no, there is no carry

<p>CVC autonomy level</p>	<ul style="list-style-type: none"> ● Regarding investment focus: very low autonomy – without buy in of a corporate business unit, we can not invest ● Regarding decision-making: high autonomy – as long as there is a buy in from a BU, we have free hand in making the investment decision. Up to a certain ticket size, we do not even present the deal to the investment committee ● Gaining this autonomy was a process: At the beginning, there was no free decision-making, but with successful investments made and time went by, trust increased and that increased autonomy in decision-making ● The low autonomy level has huge impact on daily work, coordination and collaboration with corporate BUs is high ● Interviewee would wish for higher autonomy level when it comes to investment criteria to be faster and more open to financially promising startups ● free to hire who they want and able to establish separate, lean processes and tools independently from corporate
<p>Portfolio performance and autonomy level</p>	<ul style="list-style-type: none"> ● Contribution to portfolio performance: Mainly driven by access to network (potential customers) and technology know-how. Also, the agreed collaboration with the sponsoring business unit helps. ● Limits: CVC can only provide access to resources, but the actual commercialization lies on startup side ● Low level of autonomy beneficial for portfolio companies due to access to knowledge and network ● Low level of autonomy sometimes not beneficial when it comes to investment selection (limited and slower due to BU buy in) ● 20 portfolio companies, none with unicorn status, 3 exits (acquisitions)

Other insights/ Quotes	<p>“We as a CVC can only give access to our network and knowledge. But at the end to realize high portfolio performance, the strength of the startup founder team is crucial”</p> <p>“It is easier to have the clear strategic fit of an investment to sell it to the corporate investment committee”</p>
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Table B2. Summary of Interview A

Topic	Key Insights
Introduction	<ul style="list-style-type: none"> ● Interviewee works at the CVC since 1 year ● He has background in energy industry ● In his role as Head of CVC he is responsible to build up the team, brand (internal/external), processes and strategy in the freshly founded CVC unit
General overview	<ul style="list-style-type: none"> ● Corporate and CVC are Spain based, acting globally ● CVC unit is a business unit of the corporate ● CVC is founded in March 2021 ● CVC has 4 employees currently ● Investment focus: Energy transition/decarbonization / globally (Focus US, EU) / late seed to Series B preferred, but only 5Mn budget – this is a mismatch in CVC strategy vs. freedom given by corporate
Performance measurement	<ul style="list-style-type: none"> ● Motivation: Learning and explorative activities (new markets and technology) / business transformation (identify new business partners and suppliers for the future of the corporate) ● Purely strategic investments (weighting: 90% strategic goals, 10% financial goals) ● Financially they want to become P&L positive ● KPIs: Strategic – number of corporate employees engaged in events and exposed to insights, new business partners identified, number of investments and startups assessed

	<ul style="list-style-type: none"> ● KPIs: Financial – Double digit net IRR planed, since this is a common, known metric within the corporate, too ● Definition of portfolio performance: mainly financial, return on aggregated investment / strategically, business performed with the invested companies ● CVC contribution to performance: giving access to knowledge (industry, joint venture building), access to customer data, access to market, credibility ● incentives to pursue financial goals: no, there is no carry
CVC autonomy level	<ul style="list-style-type: none"> ● Autonomy level: Rather low autonomy ● Advantage of the CVC is the corporate. The interviewee isn't a fan of fully autonomous CVCs ● But: corporate needs to understand that CVCs need different, more agile processes (special processes) ● Decision-making: currently heavy involvement from executive committee because everything is new. But the EC is very open and understanding regarding the mindset of minority investments ● Business Unit buy in: Not an investment criteria
Portfolio performance and autonomy level	<ul style="list-style-type: none"> ● Relationship to corporate caused trouble in the first months operation, there was an investment (great opportunity) that couldn't be done because CVC was too slow getting all corporate stakeholders on board ● As of today, relationship is beneficial. Feedback and questions from investment process are helpful to make a good, profound investment decision (selection effect) ● 1 portfolio company so far
Other insights/ Quotes	<p>“There were investments that would have made us rich, but we couldn't go for it because no corporate business unit gave us buy in or we were just too slow to receive the buy-in on time”</p>

Table B3. Summary of Interview B

Topic	Key Insights
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Introduction	<ul style="list-style-type: none"> ● Interviewee worked in M&A with the corporate for 2 years and then started building the CVC unit as Head of CV for another 5 years
General overview	<ul style="list-style-type: none"> ● Corporate and CVC are German based, acting globally ● CVC has two divisions, one investing in material science and one in consumer goods solutions ● CVC is a business unit of the corporate ● CVC has 20 FTEs ● CVC was founded 2015 ● Investment focus: Consumer goods and material science / globally (preferred US and EU) / late seed to Series A ● CVC does lead and co-investments (prefer co-invest with strong financial VC for signaling and branding purposes)
Performance measurement	<ul style="list-style-type: none"> ● Main goal: Open Innovation (being open to product innovation, building on top of own R&D) ● There is a fear to get disrupted by new players, corporate wants to have “skin in the game” early on ● KPIs: Very strategically (number of development agreements, cooperations, revenue increase by startup cooperations, Impact on core organization) / financial: IRR and cash return is monitored and reported but the CVC activities are not governed by it ● Weighting: 60% strategic, 40% financial ● incentives to pursue financial goals: no, there is no carry ● 16 portfolio companies, one exit (acquisition); no unicorn
CVC autonomy level	<ul style="list-style-type: none"> ● Rather high autonomy ● As long as they move within the business areas relevant to the corporate, they have free decision-making on investments ● It happened once that the board did not want to to the follow up, but the interviewee decided to to it anyways ● Buy in from BU not needed but very beneficial

	<ul style="list-style-type: none"> ● Daily work: Aligning with and involving of corporate stakeholders is a main part of the daily business ● Investment process: First get-to-know and decision to move on comes from CVC team internally. But then, pre-DD, corporate experts are immediately involved to decide if the startup is pitched to the IC. IC decides if Due Diligence should be done, after DD there is a second IC meeting for final investment decision ● free to hire who they want and able to establish separate, lean processes and tools independently from corporate
Portfolio performance and autonomy level	<ul style="list-style-type: none"> ● “Higher autonomy levels influences portfolio performance especially towards the commitment a CVC can make. If you are able to decide autonomously on investments, a CVC can commit to be a long term partner, doing follow-up rounds without the dependence on the corporate. This can influence portfolio performance.”
Other insights/ quotes	<p>“If you want to have autonomy, you need to give stakeholders the feeling of being involved. Internal stakeholder management is very relevant.”</p> <p>“There is no black and white when it comes to CVC autonomy. Being a subsidiary or rather a business unit can influence important topics like incentives, but at the end it doesn’t decide on the actual autonomy level”</p> <p>“Being autonomous means being able to keep one’s word by being able to commit to be a long-term partner, making follow-on investment decisions independent from corporate stakeholders opinion”</p>

Table B4. Summary of Interview C

Topic	Key Insights
Introduction	<ul style="list-style-type: none"> ● Investment Manager ● 4 years CVC, 2 years at current job
General overview	<ul style="list-style-type: none"> ● Insurance industry ● 9 FTEs, 100Mn fund, based in the Netherlands

	<ul style="list-style-type: none"> ● Founded 2017, operating since 2018 ● Investment focus: EU, Israel, US / Seed, Series A / not adjacent industries only but a certain relation to insurance should be there / ticket size 1-5Mn Euro ● Investments not from balance sheet but from a 100Mn fund managed by an asset manager
Performance measurement	<ul style="list-style-type: none"> ● Purely financial KPIs, no strategic KPIs ● See themselves as financial investor and act like it ● Portfolio performance measure by standard KPIs such as IRR, MOIC ● 50% of portfolio companies do have a collaboration with the corporate parent, but this is not an official KPI ● incentives to pursue financial goals: yes, there is a carry ● 19 portfolio companies, 2 exits, no unicorns
CVC autonomy level	<ul style="list-style-type: none"> ● Very high autonomy ● CVC partners make the decisions, IC includes corporate but the discussion is rather on financial level than strategic ● There should be some kind of relation to insurance but it is not a hard decision point ● In daily work, there is strong collaboration and exchange with corporate innovation team which take care about startup partnerships ● free to hire who they want and able to establish separate, lean processes and tools independently from corporate ● Does not really see downsides from this corporate relationship, the only thing is that they cannot easily invest in a startup completely unrelated to insurance and CVC has a stigma which some founders don't like
Portfolio performance and autonomy level	<ul style="list-style-type: none"> ● Corporate knowledge and expertise helps with selection of portfolio companies

Table B5. Summary of Interview D

Topic	Key Insights
Introduction	<ul style="list-style-type: none"> ● Investment Analyst ● 6 months in the CVC, M&A background
General overview	<ul style="list-style-type: none"> ● Utilities industry, France based ● CVC established in 2017 as a subsidiary ● 8 FTEs core team + resources from corporate innovation departments, backoffice is shared with the incubator unit of the corporate ● Investment Focus: Series A-B / decarbonization startups / 1-5Mn tickets, higher is possible / globally acting / prefer lead investments
Performance measurement	<ul style="list-style-type: none"> ● Main motivation: CVC investments to drive the decarbonization vision (purpose) of the corporate ● strategic: create value or future value for the corporate (synergies) /receiving a board seat is preliminary for an investment ● Financial KPIs are tracked but not officially agreed on with the corporate ● Sponsoring business unit (buy-in) is needed to do an investment ● Weighting: 60% strategic goals, 40% financial goals ● incentives to pursue financial goals: no, there is no carry ● value for startups: 1. help with investor knowledge due to the board seat / 2. help with access to corporate resources and network ● 27 portfolio companies, 13 exits, no unicorns
CVC autonomy level	<ul style="list-style-type: none"> ● rather low autonomy ● IC is composed of only corporate people, CVC managers are from the corporate ● it's a constant fight with R&D to find startups that are not seen as competitors ● buy in from BU needed for an investment

Portfolio performance and autonomy level	<ul style="list-style-type: none"> ● experiencing trouble: investments often blocked since corporate people see it as a competitor to in-house solutions instead of having the open innovation thought ● too slow to do the more demanded deals
Other insights/Quotes	<p>“Portfolio company performance means for us that it is a win-win deal - the startup grows because the value we add and our corporate can realize synergies through the relationship”</p> <p>“I feel like the CVC unit is more seen as a political/communication tool instead of an innovation vehicle”</p> <p>“Our lack of autonomy excludes us from taking part at the best deals”</p> <p>“The people that decide on our autonomy level are not within the CVC which means they don’t know why it is important to have more autonomy”</p>

Table B6. Summary of Interview E

Topic	Key Insights
Introduction	<ul style="list-style-type: none"> ● Head of CVC, 1 year with the company ● Background in IVC
General overview	<ul style="list-style-type: none"> ● Logistics and supply chain industry, UK based ● CVC operating since 2020 ● 4 FTEs, business unit of the corporate ● Investment focus: Europe / Late seed to Series A / asset-light X as a Service solutions for logistics/supply chain / EUR 500k-1Mn ticket size
Performance measurement	<ul style="list-style-type: none"> ● financial and strategic KPIs ● main reason/ value add for corporate: brand building, access to new ways of working/ technology (exploitation)/ keeping up with trends, understanding trends and strategies ● strategic fit of investment to corporate industry has to be obvious, being either relevant today or in the future ● buy-in needed from business units

	<ul style="list-style-type: none"> ● IC consists only out of corporate c-level but understanding for more financially driven investments in the future is given. But trust is not there yet. ● weighting: strategic 60%, financial 40% (MOIC, IRR)
CVC autonomy level	<ul style="list-style-type: none"> ● rather low autonomy ● right now this is still a way to go, proof has to be made to gain the autonomy they agreed on on paper ● plan is to become a subsidiary soon, implement leaner decision-making cycles and raise a fund to not invest from balance sheet of the corporate anymore ● overall, corporate ties are rather harming
Portfolio performance and autonomy level	<ul style="list-style-type: none"> ● right now with the CVC being quite new, the first investments needed a very close loop with the corporate, a lot of stakeholder management to be done ● currently, sometimes they are too slow for participating in an investment or they receive feedback from the startup that the process is too complicated for the ticket size they offer ● on the other hand, the benefits are clear: corporate employees are very curious and helpful in the assessment and due diligence process, leading to a more informed selection of investments

Table B7. Summary of Interview F

Topic	Key Insights
Introduction	<ul style="list-style-type: none"> ● Investment Manager since three years ● background in IVC and startup ecosystem
General overview	<ul style="list-style-type: none"> ● Established 2013 in Germany ● Subsidiary ● Insurance industry ● 17 FTEs ● Investment focus: globally / Series B and later / adjacent to insurance / no limit on ticket size

Performance measurement	<ul style="list-style-type: none"> ● Financial and strategic KPIs have the same worth (50/50) ● investments evaluated according to standard VC metrics (cash on cash return, IRR), exit strategies are acquisitions by third parties or IPOs, no aim to acquire themselves ● strategic KPIs involve collaboration, knowledge transfer sessions, cost reduction/revenue increase by collaboration
CVC autonomy level	<ul style="list-style-type: none"> ● many successful investments and the years operating lead to rather high autonomy ● there is still a limitation in investment areas and the IC includes only corporate stakeholders, which limits autonomy to a certain extend ● still, investment are barely neglected by IC because trust is given ● no BU buy-in needed for investments ● free to hire who they want and able to establish separate, lean processes and tools independently from corporate
Portfolio performance and autonomy level	<ul style="list-style-type: none"> ● rather beneficial ● processes are lean and clear, and the investment team can work quite independently ● weekly catch up calls with corporate innovation unit to discuss potential deals

Table B8. Summary of Interview G

Topic	Key Insights
Introduction	<ul style="list-style-type: none"> ● Investment Manager, started three years ago as Associate ● Background in startups and the corporate parent of the CVC
General overview	<ul style="list-style-type: none"> ● Subsidiary CVC unit established 2011 in Spain ● Small office in Lisbon and Berlin but headquarter Madrid ● telecommunications industry ● 13 FTEs, 8 in Madrid

	<ul style="list-style-type: none"> • Investment Focus: telecommunication services and technologies / pre-seed to series A / globally, but focus on Europe • 198 portfolio companies, 20 exits, 8 unicorns
Performance measurement	<ul style="list-style-type: none"> • Very active, doing a lot of small tickets per year • Strategic KPIs are weighting more, even though on paper it is said 50/50 (reality vs. plan!) • investments evaluated according to standard VC metrics (cash on cash return, IRR),
CVC autonomy level	<ul style="list-style-type: none"> • No buy-in from corporate BU needed • Rather low overall autonomy perceived • IC never neglects investments but they could, and the CVC team always highlights strategic value a lot to make sure IC agrees • strategic fit needs to be given today or at least in the near future • IC looks at every deal even for very small tickets and even though they already showed a great portfolio performance in the last 10 years (mindset! Trust is there but still they don't act completely hands-off) • IC consists of CEO, CFO, CDO and CIO of corporate parent, purely corporate stakeholders • Operational decision-making is quite autonomous, they are a small independent team with their own hierarchy structure, tools and operational processes (e.g. they use slack while the corporate is only allowed to use teams)
Portfolio performance and autonomy level	<ul style="list-style-type: none"> • rather beneficial, even though sometimes speed is a problem • being a subsidiary, they have their own CI and brand, explaining that decisions rely on corporate is often hard to explain to startups

Other insights/ quotes	<ul style="list-style-type: none"> ● “It is really annoying sometimes: In the way we work and lead the team, we are very independent, we have our own logo and CI colors. We show great history of portfolio performance, but the board still does not allow us to do investments without their agreement. I feel like this is a very old mindset, they are scared to loose control”
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Table B10. Summary of Interview H

Appendix C - Expert interview code guide

Column	Experts	Occurrence in Interviews	Category	Subcategory
1			Organizational Structure (objective autonomy)	
2	A, D, E, G, H			Subsidiary (Separate Entity)
3	B, C, F			Business Unit
4			CVC Team Size	
5	A, C, D, G			>= 10
6	B, E, F, H			<10
			Years of Activity	
	A, C, D, E, G, H			> 2 years
	B, F			< 2 years
7			Investment Focus	
8	A, C, D			Stage: Pre-seed to Series A
9	A, B, E, G, H			Stage: Series A and later
10	A, B, C, D, G, H			Investing Globally
11				Investing in Europe only
12	A, B, C, E, G			Main Rationale: Strategic
13	D, F, H,			Main Rationale: Financial
14			Performance Measures	
15	A, B, C, E, F; G, H			Strategic KPIs
16	A, C, D, F, G, H			Financial KPIs
17	A, B, C, E, F			Strategic KPIs > Financial KPIs
18	A, B, C, E, F, H			No employee incentives to pursue financial KPIs
			Investment Decision-Making Autonomy Level	
	A, C, D, G,	5		Rather high to high autonomy
	B, F, E, H	3		Rather low to low autonomy
19			Overall Autonomy Level	
20	B			Very Low Autonomy
21	E, F, H			Rather Low Autonomy
22	A, C, G,			Rather High Autonomy
23	D			Very High Autonomy
24	A, C, D, G			Gaining Autonomy takes time
25	A, B, E, F			Wish for more autonomy
26	B, E, F			Need for Business Unit Buy-In
27			Corporate Relationship perceived by CVCs	
28	A, C, D, G			Rather beneficial for CVC activities
29	B, E, F			Rather harming for CVC activities
30				
			CVC Value Proposition towards Corporate Parent	

31			CVC Value Proposition towards Portfolio Companies	
32	A, D, E, F, G			Venture Capital Expertise
33	A, B, E, F, G			Access to Technology and Industry Knowledge
34	A, B, D, F			Access to Customer Base
35	A, B, D, E, G			Collaborations/ Partnerships
36	B, D, F, G			Credibility/ Reputation
37			Corporate relationship benefits perceived by CVCs	
38	B, D, F, G			Informed Investment Selection
39	A, B, E, F, G			Support in Portfolio Management
40			Corporate relationship challenges perceived by CVCs	
41	A, B, E, F			Low Decision-Making Speed
42	A, B, C, D, E, F, G			Restricted in Investment Selection
43	B, F			Restricted in Ticket Size
44	A, B, C, E			Restricted in follow-up investments

Table C1. Expert interview code guide