Corporate Venture Capital – Parent Firm Value Relationship: Firm Structure and Environment as Contingencies

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Abstract

More and more firms are implementing a division of Corporate Venture Capital (CVC) as a strategy to differentiate their portfolio and create value. Through investments in entrepreneurial ventures, companies acquire innovations and new technologies to maintain and increase competitive advantages. Nevertheless, the relationship between CVC and investing (parent) firm remains an important research topic to dive into. Starting from the contingency theory, I propose that a rise in company value via CVC investing is contingent on attentional mechanisms that discipline the selection of fresh investment opportunities.

Focusing on U.S. American parent companies of CVC divisions, this dissertation examines the impact of industry and firm-specific determinants on CVC investment activity in various industries, as well as related effects on firm value. An increase in firm value connected with CVC investing, I believe, accrue to firms that adopt specified operational structures and operate in specific environments, with business similarity with the entrepreneurial ventures and operating in the same metropolitan area. I show evidence that parent firm value increases among companies investing in CVC that are operational concentrate and operate in low munificence environments. I find support for my research model in a sample of 1.989 firm-year observations and 159 U.S. American companies between 2000 and 2020.

This analysis aims to show that managers of companies which are active in the CVC market should take into considerations the above-mentioned effects when approaching an investment in venture capital, in order to maximize the firm's gains in terms of innovations and strategy.

Keywords: *Corporate Venture Capital, CVC, CVC Activity, Tobin's Q, firm value, operational structure, environmental munificence, industry similarity, geographic proximity, contingencies.*

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Resumo

Cada vez mais empresas estão a implementar uma divisão de Corporate Venture Capital (CVC) como uma estratégia para diferenciar a sua carteira e criar valor. No entanto, a relação entre a CVC e a empresa (mãe) investidora continua a ser um importante tópico de investigação a aprofundar. Partindo da teoria da contingência, proponho que um aumento do valor da empresa através do investimento da CVC está dependente de mecanismos de atenção que disciplinam a seleção de novas oportunidades de investimento.

Centrando-se nas empresas-mãe americanas das divisões CVC, esta dissertação examina o impacto da indústria e dos determinantes específicos da empresa na actividade de investimento CVC em várias indústrias, bem como os efeitos relacionados no valor da empresa. Um aumento no valor da empresa ligado ao investimento da CVC, creio eu, resulta em empresas que adotam estruturas operacionais específicas e operam em ambientes específicos, com semelhança de negócios com os empreendimentos empresariais e que operam na mesma área metropolitana. Mostro provas de que o valor da empresa mãe aumenta entre as empresas que investem em CVC que são concentradas operacionais e operam em ambientes de baixa munificência. Encontro apoio para o meu modelo de investigação numa amostra de observações de 1.989 de anos de empresa e 159 empresas americanas entre 2000 e 2020.

Esta análise visa mostrar que os gestores de empresas activas no mercado de CVC devem ter em consideração os efeitos acima mencionados ao abordar um investimento em capital de risco.

Palavras-chave: *Capital de risco corporativo, CVC, actividade CVC, valor firme, Tobin's Q, munificência ambiental, estrutura operacional, semelhança da indústria, proximidade geográfica, contingências.*

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List of Abbreviations

2SLS	**Two-Stage Least Squared**	**MSA**	**Metropolitan Statistical Area**
A	**Total Assets**	**MVE**	**Market Value of Equity**
ABV	**Attention-based view**	**OLS**	**Ordinary Least Squares**
CVC	**Corporate Venture Capital**	**OS**	**Operational Structure**
e.g.	**exempli gratia**	**PS**	**Preferred Stock**
EM	**Environmental Munificence**	**ROE**	**Return on Equity**
et al.	**et alia**	**R&D**	**Research and Development**
GP	**Geographic Proximity**	**SIC**	**Standard Industrial Classification**
i.e.	**id est**	**U.S.**	**United States**
IS	**Industry Similarity**	**TQ**	**Tobin's Q**
IVC	**Independent Venture Capital**	**VIF**	**Variance Inflation Factor**

1. Introduction

Corporate Venture Capital (CVC) is the practice of directly investing corporate funds into external new ventures. CVC investing allows established companies to become aware of and obtain access to promising new resources and market prospects by investing in external entrepreneurial businesses (Benson & Ziedonis, 2009; Maula, Keil, & Zahra, 2013). Several studies have linked these investments to a variety of firm outcomes, including improved innovative performance (Dushnitsky & Lenox, 2005a; Wadhwa, Phelps, & Kotha, 2016), strategic capability experimentation (Keil, Autio, & George, 2008), and greater awareness of technological changes (Maula et al.). The significant increase in scholarly research on CVC investments can be attributed in part to the volume of venturing behaviors undertaken by companies each year—US-based, VC-backed companies raised over $62 billion in Q1'21, up 117 percent year over year (YoY) from Q1'20 and up 62 percent from Q4'20. YTD financing is approximately half of total funding in 2020 after the first quarter of 2021, establishing a solid pace for the rest of the year. Deal activity increased to 1,735 deals, up 14% year over year and 5% from Q4'20. (According to the Pwc MoneyTree Report, 2021).

Prior research has mostly focused on two types of analyses. On the one hand, it investigates the antecedents of CVC behaviors as well as the underlying behavioral and economic factors. On the other hand, it looks into how CVC investments affect firm innovation output. Previous literature has not yet performed a combined analysis in this format. Although Titus and Anderson (2018) looked at the impact of CVC activity, environmental munificence, and operational structure on firm value, and Sahaym et al. (2010) looked at the impact of environmental munificence and technological fit on CVC activity, there hasn't been a comprehensive analysis of the factors yet. To summarize, research has largely disregarded whether and when a company's competitive environment and resources influence its willingness and ability to invest in startups.

Despite empirical agreement that CVC investments can contribute to the inventive efforts of the investing, or parent, firm, little is known about the conditions under which CVC investments boost parent firm value. On this topic, the literature provides two key insights. First, Dushnitsky and Lenox (2006) discovered that when organizations made CVC investments for strategic rather than just financial benefit, the overall amount of money invested boosted corporate value. Second, Yang, Narayanan, and De Carolis (2014) discovered that the level of CVC investment

portfolio diversity and business value creation have a U-shaped relationship. The relevance of "fit" between CVC investments and firm investment orientation (i.e., strategic rather than financial aims, focused investment portfolios that emphasize options logic, or diversified portfolios that emphasize net present value logic) is highlighted in both sets of data. While CVC units are part of bigger organizational settings (Souitaris, Zerbinati, & Liu, 2012), and organizations are part of wider environmental contexts, it's unclear how these factors affect a company's capacity to gain value from its CVC investments. Scholars have long linked the effectiveness of entrepreneurial methods to organizational structure (e.g., Green, Covin, & Slevin, 2008; Rind, 1981), as well as environmental constraints (e.g., Covin & Slevin, 1989), leaving the inclusion of these factors a major gap in the literature.

In general, I respond to the following research question: When are CVC investments linked to the value creation of the parent company? Following a path similar of the one approached by Titus and Anderson (2018), I investigate two distinct contingencies—one structural (internal to the firm) and one environmental (external to the organization)—that help to facilitate the relationship between CVC investment and firm value. I describe CVC investment as a strategic focus of management attention, based on the attention-based approach (ABV; Ocasio, 1997, 2011), with the goal of "scanning the environment for novel technologies that either threaten or complement core businesses" (Dushnitsky & Lenox, 2006, p. 756). While this focus motivates action, it does not always convert into increased business value. As a result, I enhance ABV with contingency theory (Drazin & Van de Ven, 1985), which has a long history of relating organizational efficiency to specific structural and environmental situations (Van de Ven, Ganco, & Hinings, 2013). I propose that the presence of two unique attentional elements, which I describe as attentional coherence mechanisms, is required for boosting firm value from CVC investing activity. I argue that focusing on CVC investing alone does not significantly boost business value. Instead, investing in CVC in the presence of two attentional coherence mechanisms promotes investing in CVC investment possibilities with the greatest potential strategic benefit, and thus value creation, for the investing firm.

I use a 159-firms panel dataset from the United States from 2000 to 2020, across 96 different industries (assessed by SIC codes). First, I look at the impact of firm and industry-specific determinants on parent firm value using two separate measures: firm-specific operational structure and industry-specific environmental munificence. I investigate whether firms' operating structure and the size of their industry environment have a substantial impact on firm value, as well as whether CVC activity nurtures parent firm value, also including the relationship between the interactions of the previous mentioned variables and the parent firm

value. Second, I examine the influence of other two metrics, industry similarity and geographic proximity (between parent firm and entrepreneurial venture), on the value of the parent company. I believe that CVC investments in industries similar to the one of the parent firms boost the synergies between acquired entrepreneurial ventures and the investor, due to similarities in technologies used and practices adopted, increasing the value of both players and leading to a win-win situation. Moreover, if the venture has its headquarters close to the CVC investor, the parent company can beneficiate from using the acquired knowledge and technologies through the same geographic market, increasing its market share and so, its market value.

2. Literature Review

2.1. Theoretical Development

Established corporations make CVC investments, which are direct minority equity investments in privately held entrepreneurial ventures (Drover et al., 2017). CVC operations are a medium for exploitation of knowledge, driving innovation, and investigating new advancements, implying that corporate investors have a strategic emphasis while attempting to incorporate innovative ideas from their investments (Drover et al., 2017). Corporate investors contribute funds and complementary assets to start-up enterprises in exchange for sharing their industry knowledge, network, and client access (Cumming, 2012).

The ABV, which states that business behavior is a result of what managers pay attention to and the contextual elements impacting attentional focus, is one of the most important milestones of my research model (Ocasio, 1997, 2011). According to the concept of attentional focus, managers can only focus on a limited number of topics at any given moment, and what they focus on determines their actions (Simon, 1947). I believe that CVC investing is one of several strategic decisions vying for senior decision makers' limited attention. CVC investments are often made for strategic rather than financial motives (Dushnitsky & Lenox, 2006), such as pursuing new market opportunities (Wadhwa et al., 2016). CVC investing, for example, facilitates innovative inter-firm resource combinations while decreasing strategic risk (Allen & Hevert, 2007). It also allows the investing firm to explore attractive but mostly unpredictable alternatives (Keil, Autio, et al., 2008). (Basu, Phelps, & Kotha, 2011).

However, as one among a plethora of corporate strategy options, there is no reason to believe that CVC investing is a significant generator of company value in and of itself. According to

Hitt, Ireland, Camp, and Sexton (2001), value generation through entrepreneurial activity is partly determined by whether the action aligns with a firm's strategy—that is, whether the activity is strategically entrepreneurial. When one considers the high-variance and experimental nature of CVC investing (e.g., Keil, Autio, et al., 2008), this issue becomes even more important. While participating in CVC investments necessitates managerial attention to the activity, this does not always imply efficacy; attention does not always mean success. This is in line with the idea of contingency theory, which holds that there is no "one best way" without taking context into account (Lawrence & Lorsch, 1967). As a result, I need to look into potential contingencies that promote fit between CVC investments and the larger organizational and environmental context, with fit being defined as the alignment of strategic action with important contextual aspects that help managers achieve their goals. To analyze the structural and environmental conditions where CVC investments create firm value, I enhance ABV with contingency theory.

According to contingency theory, "...performance outcomes of an organizational unit are a result of the fit between the unit's external context and internal arrangement" (Van de Ven et al., 2013, p. 394). Contingency theory, as used in the ABV literature, provides insight into how a specific decision fits into the larger organizational structure and predicts the performance implications of that decision (Cho & Hambrick, 2006). The firm's institutional, economic, and social structures—both within and outside the firm's boundaries—shape organizational attention, which in turn drives firm behavior, according to the attentional perspective (Ocasio, 2011). These exogenous and endogenous attention structures "regulate . . . the interests and identities that guide decision-makers' actions and interpretation" according to the researchers (Ocasio, 1997, p. 195). This shows that the environment around a decision is extremely important to the outcome of that decision from the ABV and contingency perspectives (Ocasio, 1997; Tosi & Slocum, 1984). As a result, I concentrate on the attention structures that are conceptually likely to influence CVC investing's value-creation potential—that is, to improve the match between strategy and circumstance.

As a final analysis in this paper, I study the effect of industry similarity and geographic proximity between the parent company and the entrepreneurial venture where the investment is directed. Previous studies show that the development of new companies' innovations is facilitated by business similarity (Shuwaikh, Dubocage). Moreover, similar cognitive architecture, same languages, and shared capacities enable technical learning and communication (Kogut and Zander, 1992). Prior research on local bias in venture capital markets has not adequately studied how local bias is affected by VC characteristics.

Furthermore, it has not been extensively addressed whether and how local bias changes for VC markets versus other forms of financial intermediation. As well, there is no or little empirical evidence on the performance implications of local bias, which should be crucial for the issue of VC fund diversification and specialization (Cumming and Dai, 2012). More informal techniques of control, such as investing in close geographic areas, may be used by VCs and business angels to reduce risk, invest close to home and in a syndicate with other angels (Wong, Bhatia and Freeman, 2009). Firms create new satellite offices based on the success rate of venture capital-backed investments in a certain area, according to the findings of Chen et al. (2009). Furthermore, the researchers discovered that geography had a major impact on results. Regardless of the stage of the investment, venture capital firms operating in venture capital centers outperform.

3. Hypotheses Construction

3.1. The Relationship between CVC investments and parent firm value

Because of the nature of CVC – which is typically utilized for strategic purposes such as obtaining information and technology – study has primarily focused on its success. CVC investments have been reviewed from a strategic standpoint in papers like Belderbos et al. (2018) and Dushnitsky & Shapira (2010), which looked at their ability to generate technological and knowledge advancements. There has been a lot of research done on the link between CVC investments and corporate innovation outputs. The situations in which CVC activity affects the value of a parent corporation, on the other hand, have received less attention. Nonetheless, there are three key assumptions in the literature: According to Dushnitsky and Lenox (2006), CVC investments have boosted parent business value when they are made for strategic rather than financial reasons. Furthermore, Yang et al. (2014) discovered evidence of a U-shaped association between the extent of portfolio diversity of CVC investments and business value creation. Both show that the generation of firm value is an appropriate focal-dependent variable for CVC activity, assuming that firm value includes the investors' current judgment and future expectation of creating value through strategic initiatives (Brush et al., 2000; Titus & Anderson, 2018).

As a result, I'll focus on the business value component of CVC investment activity, which leads to the following hypotheses:

> **Hypothesis 1**: Increased CVC activity has a significant positive impact on company value.

3.2. The Contingent Effect of Operational Concentration

Managerial focus and attention are framed by the decision-making context (Nadkarni & Barr, 2008), and managerial attention selectivity in light of contextual requirements adds to the performance outcomes of a given strategic decision (Garg, Walters, & Priem, 2003). To investigate the value generation for parent companies via CVC investments, I must explicitly account for the contextual structural elements that facilitate situations in which decision-makers are more likely to make a value-producing decision (Garg et al.). The internal structure of a company generates a lot of essential and changing data that competes for senior management's time and attention (Garg et al., 2003). To that purpose, I concentrate on operational structure, which is defined as the degree to which a company's business segment reporting structure is more managerially centralized or more scattered. Companies with a concentrated operational structure provide strategic decision-making authority to as few people as possible (Burns & Stalker, 1961). To describe operational structure, I take the methodology of Titus and Anderson (2018), who define it as the degree to which a corporation is either more concentrated or differentiated in relation to the annual reporting and financial statement reporting business sectors. Organizations with a concentrated operational structure, according to Hurley & Hult (1998), centralize their strategic decision-making around a small number of executives, whereas operationally diffuse organized firms are known to transfer decision-making authority to lower hierarchical levels (Chandler, 1991). In terms of communication dissemination, operational structure does not convey the firm's distinctive organizational structure (Burns & Stalker). Rather, operational structure is defined by the amount to which the senior most executive is involved in the development of business unit strategy (Bartlett & Ghoshal, 1993; Galunic & Eisenhardt, 2001). Senior executives in operationally concentrated firms are more likely to be involved in developing business strategy below the corporate level (Chandler, 1991; Joseph & Ocasio, 2012), whereas strategic decision-making decentralization is more common in operationally diffuse firms (Chandler, 1991; Joseph & Ocasio, 2012). (Donaldson, 1987). Senior executives in operationally concentrated firms are better aware of the strategic issues that their lower-level enterprises face, and they are more likely to direct organizational resources to capitalize on emerging possibilities (Eisenmann & Bower, 2000). This attentional concentration is a key aspect in generating value from CVC investments. The CVC investment decision-maker is better aware of how such investments fit into the organization's broader

strategic emphasis, and as a result, the investment is more likely to create meaningful new value for the firm (Basu et al., 2011). I contend that operational structure is an attentional process that frames the most important interests and identities for firm action (Ocasio, 1997). The more operationally focused a firm is, the tighter the constraints on perceived opportunities are, allowing decision makers to focus on CVC activities that correspond with the firm's strategic objectives; hence, the greater the possibility that CVC activity improves the firm's value. This is consistent with Hashai's (2015) statement that managers make more effective judgments when they concentrate on a few product categories rather than dividing their attention across several. According to a study by Laureiro-Martnez, Brusoni, Canessa, and Zollo (2015), processes that increase attentional control may assist exploratory activities, which is how CVC investments are often regarded (Schildt, Maula, & Keil, 2005). Furthermore, my thesis is comparable to Barnett's (2008) notion that the more internally focused an organization's attention structures are, the more likely it is to discover new opportunities that are compatible with the firm's current operations. Van Doorn, Jansen, Van den Bosch, & Volberda (2013) define the strategic goal of a firm's entrepreneurial endeavors as "a strategically coherent portfolio of venturing activities that shares important linkages with the firm's existing operations, thereby improving firm value." Hence:

> **Hypothesis 2**: The relationship between CVC investments and parent firm value is strengthened by increasing operational concentration.

3.3. The Contingent Effect of Environmental Munificence

Since it plays such a significant role in the relationship between organizational performance and learning, the concept of environmental munificence has gotten a lot of attention in recent years. The purpose of this research is to see how the concept of environmental munificence influences CVC investment activity and business value. Environmental munificence refers to the "extent to which the environment could support sustained growth of the firms" (Starbuck, 1976), which means the "scarcity or abundance of critical resources needed by firms operating within an environment" (Castrogiovanni, 1991). This indicates that the resources available in a given area have an impact on the expansion and survival of businesses within that environment. According to research, organizations are able to seek expansion when resources are abundant, however when resources are scarce and generosity is waning, competition intensifies and firms are less likely to engage in growth (Castrogiovanni, 1991). As a result, a low level of

environmental munificence indicates that resources are few, whereas a high level of environmental munificence indicates that resources are abundant (J. Y. Lee et al., 2020).

A munificent industry environment generates more firm resources while simultaneously reducing rivalry for and reliance on these resources (Boyd, 1990). Those resources can be used for a variety of strategic and organizational aims and initiatives, including as obtaining external expertise to stimulate innovation from entrepreneurial companies via CVC investing. Furthermore, the more abundant the environment, and thus the higher the capacities and resources of the organization, the better the firm is able to apply learning (Li et al., 2013). Firms, on the other hand, should be careful and modest with regard to the balance of exploration and exploitation activities under a condition of low environmental munificence (Li et al., 2013). Due to limited resources, enterprises are less inclined to engage explorational activities (Sahaym et al., 2010). In these less generous conditions, when firms' continued existence within their particular industries is jeopardized by increased competition for fewer resources, sales growth is constrained because future growth is less of a priority (Castrogiovanni, 1991). Companies in these industries are more concerned with consolidating, decreasing expenses, and governing and controlling the dangers to their survival than with extending their investment operations (Sahaym et al., 2010).

Excess resources in companies with a high level of environmental philanthropy, on the other hand, can be used to achieve strategic goals using methods like CVC investment and market surveillance for innovative and emerging technologies and market trends. As a result, resource-rich environments encourage the market's discovery of new competences and technologies, increasing firm value. Because the firm already has internal knowledge in these areas, the discovery process usually starts in related industries (Sahaym et al., 2010). Furthermore, the presence of excess resources might exacerbate the competition for innovation within the business and encourage the pursuit of unique projects such as CVC investments (Gompers et al., 2005; Sahaym et al., 2010).

As a result, the second hypothesis emerges:

> **Hypothesis 3**: The relationship between CVC investments and parent firm value is strengthened by decreasing environmental munificence.

3.4. The Effect of Industry Similarity

I define business similarity as the degree of overlap between the partners' principal businesses (Villalonga and McGahan, 2005). Business resemblance aids in the development of new companies' technologies (Shuwaikh, Dubocage). The field of strategic management has looked into relatedness and value creation in greater depth (Piscitello, 2004; Rumelt, 1974; Seth, 1990). Seth (1990) underlines the importance of understanding how synergies are created and how they affect innovation output. The "strategic fit" between the linked enterprises is a critical aspect driving the possible synergies that can be realized. Technical learning and communication are made possible by similar cognitive structures, shared languages, and shared abilities (Kogut and Zander, 1992). If the knowledge bases are unrelated, applying or absorption of new knowledge will be challenging and resource-intensive (Haspeslagh, 1991).

Relatedness between the focus firm and the investment partner is discussed by Coase (1937) and Oxley & Sampson (2004). Because of the organization's economies of scale, a mix of resource-based and transaction-cost considerations suggests that increased relatedness equals lower integration costs. An acquisition's 'integration potential' is boosted by relatedness (Larsson and Finkelstein, 1999). Technological relatedness means that the parties have complementary and similar knowledge bases and can achieve economies of size and scope in the R&D process by reducing duplication and implementing operational improvements (Hagedoorn, 2002; Makri et al., 2010). Furthermore, they may be able to provide access to unique co-specialized complementary assets that acquirers require in order to market their inventions (Teece, 1986).

In addition, acquisitions are common in high-tech businesses to strengthen technical capabilities and innovative performance (Cassiman et al., 2005; Hagedoorn and Wang, 2012; Stiebale, 2013; Villalonga and McGahan, 2005). Prior research on technology acquisitions has revealed that the degree of similarity between the acquirer's and target's businesses is a key predictor of post-acquisition innovation performance (Ahuja and Katila, 2001; Cassiman et al., 2005; Cloodt et al., 2006). This study stream has so far concentrated on determining how helpful business relatedness is for future synergy development (Bena and Li, 2014; Sears and Hoetker, 2014). According to these studies (Ahuja and Katila, 2001; Cassiman et al., 2005; Makri et al., 2010; Sears and Hoetker, 2014), technological relatedness between parties improves innovation output.

According to Cassiman et al. (2005), the influence of M&A on R&D and innovation is dependent on the companies' relatedness. Business similarity and complementarity can be used

to evaluate technological relatedness (Cassiman et al., 2005). In a similar vein, Makri et al. (2010) stated that technological complementarity between partners results in higher quality and more original ideas. They argue that the relationship between acquisition and innovation is influenced by business similarity.

Efficiency synergies occur from both technological and market relatedness in terms of innovation outcomes (Cassiman et al., 2005). Industry relatedness has a good effect at each phase of innovation, according to Howell (2020). Acquisitions add to innovation performance, according to M&A literature, while relatedness raises acquisitions' 'integration potential' and expands the scope for exploiting efficiency synergies in the innovation process. (Cefis et al., 2020) confirm that when learning skills from both internal R&D and acquisition experience are high, acquirers can obtain greater inventive performance in the case of high business relatedness. Taking everything in consideration, I assume that CVC-backed entrepreneurial companies that present business similarity with the investing company will increase the firm value of the parent firms.

> **Hypothesis 4**: Higher level of business similarity between entrepreneurial companies and the parent company result in a higher firm value of the investing firm.

3.5. The Effect of Geographic Proximity

In practice, venture capital (VC) is more about where you are than who you know. Some VCs even follow the "twenty-minute rule," which states that a start-up company seeking venture financing must be within a twenty-minute drive of the VCs' headquarters in order to be funded. Both theoretical work and empirical evidence are generally in agreement with these recent observations in the popular press. The geographical distance between the investor and the company has already been investigated, as closeness enhances engagement and information flow (Stuart and Sorenson, 2003; Tian et al., 2020). According to Stuart and Sorenson (2003), relationships are more likely to emerge when people are in close proximity. According to Doloreux (2002), closer geographical distance between partners leads to faster communication between players and lower costs associated with exchanging knowledge and information.

The venture capital literature, as well as the investment literature more broadly, has documented a "home (local) bias" phenomenon, in which IVCs are better able to resolve the information asymmetry problem and conduct more efficient monitoring when they invest in companies that are geographically closer (Bernstein et al., 2016; D. Cumming and Dai, 2010; Hochberg and

Rauh, 2013). Ma (2020) investigated whether CVCs are more or less likely to invest in companies that are geographically close to them, and discovered that CVCs do not have a preference for "home" companies. CVCs appear to have a "reverse home bias" and are less likely to invest in companies in their geographic areas, according to Peri (2005) and Matray (2021), because CVC parent firms can acquire innovation knowledge from startups in the same zone through local innovation spillover, lowering the marginal benefit of making a CVC investment in them (Ma 2020). Gaba and Meyer (2008) investigated the CVC style used by a sample of Fortune 500 companies in the technology and telecommunications sector. They discovered that organizations start a CVC program when they are close to a VC cluster (e.g., Silicon Valley) and when venture capitalists' success is well-known. According to Catalini (2017), partners that are close to each other have a higher chance of consolidating. Modern fieldwork necessitates the use of limited and costly equipment and laboratories. The problem of having to obtain complex equipment and R&D personnel is solved by geographic proximity. The closer the distance between the corporate investor and the firm, the better the CVC-backed company's ability to access complementary resources. I expect a company sponsored by a distant corporate investor to have fewer access to laboratories and R&D experts, as well as weaker inventive methods. As a result, the investor would receive less value from the distant CVC-backed company because it will suffer greater expenditures and time to access the CVC-backed company's facilities. I believe that CVC-backed companies in close proximity to the parent company will raise the value of the parent company more than CVC-backed companies located further away.

> **Hypothesis 5**: A higher level of geographic proximity between the parent company and the CVC investment results in a higher firm value of the investing firm.

3.6. The Effect of Attentional Coherence

When engaging in CVC operations, it has been established that corporate investors are primarily focused on strategic goals such as acquiring access to expertise and technologies. In any case, if businesses gain and apply knowledge, they may be able to raise their corporate valuation. Furthermore, it has been demonstrated that corporate investors with more CVC deal expertise are more successful in obtaining and managing deals with entrepreneurial ventures (Siegel et al., 1988). A significant amount of earlier CVC activity creates essential learnings for corporate investors and equips them to make superior decisions, which is a key aspect in this connection

(Yang et al., 2009). According to Benson and Ziedonis (2009), knowledge gathered through the acquisition of start-ups improves the returns to corporate investors. Dushnitsky & Lenox (2006) also discovered that CVC investing activity has a significant impact on improving Tobin's Q, and that CVC pursued for strategic aims is likely to produce firm value. Fels et al. (2021) conducted a thorough analysis of the factors that determine CVC success, discovering that a complex set of organizational relationships, managerial influence and attention, portfolio composition, and corporate knowledge are all direct predictors of CVC effectiveness. Titus and Anderson (2018) also add by analyzing factors such as the firm's operational structure and environmental munificence, which help to smooth the relationship between CVC investment and firm value.

They argue that recognizing those contingencies is critical to getting the most strategic benefit from CVC investment operations, which leads to the fourth hypothesis:

> **Hypothesis 6**: On company value, there is a three-way interaction impact between CVC activity, environmental munificence, and operational structure, which grows the highest among firms with high CVC activity, are operationally concentrated, and operate in industries with low environmental munificence.

4. Data and Sample Selection

I'll present an outline of how the data extraction and sample selection were done in the following sections. Because there is enough data available, the study concentrates on CVC activities in the United States. I created a panel of U.S. publicly traded businesses making CVC investments in every industry using CVC investment data from Thomson Financial's Securities Data Company Platinum and the North American Fundamentals Annuals and Historical Segments information from COMPUSTAT for the years 2000-2020.

To obtain accounting and market data on the firm, I firstly selected CVC investments in the universe. Then, in order to access accounting and market data on the corporation, I derive the Ticker of each parent company of the relevant CVC unit. All firms whose market and accounting data could not be retrieved in order to build the variables were subsequently sorted out. This includes firms that are not publicly traded in the United States and are privately held, bringing the total number of investment observations in the CVC area to almost 6.000. I use Compustat to download financial and accounting data for the years 2000 through 2020. If one

or more variables have missing data, the corresponding observations for company *i* in year *t* are removed from the dataset to ensure that the dataset is complete and consistent.

After that, I started cleaning the dataset, in order to remove observations with missing values and obtain more consistent values for my analysis. Doing so, I removed observations with negative firm value (due to missing data of its components), negative firm size and I also removed outliers where needed (below 5% and above 95%), to improve the quality of my data. In the end, my dataset consists of 159 companies and 1.989 firm-year observations over a time frame of 20 years, from 2000 to 2020.

In the table below, I provide the number of enterprises based on a two-digit SIC code level that are domiciled in these six key industries. It reports that 138 out of 159 companies, present in my dataset, that is equal to 86,79%, are operating in a high technology industry.

To conduct my study, I use the programming software Stata V.14 released from Stata Corporation.

Table 1

Firm Overview by Industry

SIC	28	35	36	38	48	73	Total
Investors' number	14	16	25	13	17	53	138

This table shows how corporate investors are distributed throughout the six major industries. The industries are classified using the SIC code, which is a two-digit level.

4.1. Firm Value (Tobin's Q)

Tobin's Q is a proxy for determining the impact on firm value. It's a ratio that compares a company's market value to the cost of replacing its assets (Titus & Anderson, 2018). Tobin's Q was chosen above other performance measurements for a variety of reasons. Tobin's Q is a single variable that incorporates the effect on a firm's short- and long-term performance. It is based on market data rather than accounting data (Yang et al., 2014). One advantage of the metric is that it not only considers risks, but also long-term prospects, such as predicted earnings

in the future (Jeong et al., 2020; Lubatkin & Shrieves, 1986; Uotila et al., 2009). It is also unlikely to be affected by potential reporting twists (Jeong et al., 2020; Lindenberg & Ross, 1981), and it minimizes serial correlation while increasing causal adjacency (Jeong et al., 2020; Lindenberg & Ross, 1981). (Stulz, 1994). In addition, recent research has shown that Tobin's Q is a useful tool, with Dushnitsky & Lenox (2006) and Jeong et al. (2020) finding a significant influence of CVC investing on Tobin's Q. Furthermore, a value of 1 implies that the market value of the firm is equal to the value of the firm's assets, making Tobin's Q easy to understand. Higher Tobin's Q values indicate higher market valuations and growth potential than lower values, and a Tobin's Q above 1 indicates a positive market perspective on the firm's growth opportunities (Chung & Pruitt, 1994). Instead, a ratio of less than one shows that investors believe the company's value is less than the replacement value of its assets (Brush et al., 2000). I compute Tobin's Q using the methods of (Chung & Pruitt, 1994), who created a simple estimate of Tobin's Q:

$$Tobin's\ Q = \frac{Market\ Value\ of\ Equity_{it} + Preferred\ Stock_{it} + \left(Curent\ Assets - (Long - term\ debt + current\ liabilities)\right)_{it}}{Total\ Assets_{it}}$$

$$= \frac{MVE_{it} + PS_{it} + DEBT_{it}}{A_{it}}$$

The market value of equity (MVE) is calculated by multiplying a company's closing share price by the total number of common shares outstanding in a particular quarter (t). The liquidated value of the firm's outstanding preferred stock in a particular quarter t is used to determine the Preferred Stock (PS). For a particular quarter t, the differential value of the total of long-term debt plus current liabilities minus current assets was determined to calculate DEBT. The value of total assets for a given quarter t was utilized to calculate Total Assets (A). Compustat is used to retrieve all financial and accounting performance data used in the computation of Tobin's Q. In all the hypotheses, Tobin's Q is utilized as the dependent variable to test for firm value.

4.2. CVC Investments

Several different methods are approached in order to measure CVC Investments. Count measures have been employed in CVC research (e.g., Keil, Maula, et al., 2008) and related literatures, like acquisitions (e.g., Gamache, McNamara, Mannor, & Johnson, 2014). For example, Basu et al. (2011) collect the construction of all new CVC partnerships and count it

as the amount of new ventures in portfolio in which a parent firm *i* concluded CVC investments in year *t*. CVC investments were counted following the same methodology of Sahaym et al. (2010), who accounted the aggregate count of CVC deals by each CVC investor as the measure. According to Titus and Anderson (2018), I normalized the measure (as I did with other predictor factors) to make it easier to interpret. CVC activity serves as the dependent variable to test hypothesis 1 and 6, because of the motivation for this research issue and the theoretical framing. I used Thomson Financial's Securities Data Company Platinum to extract all investments in different industries throughout the time period from 01.01.2000 to 31.12.2020; then, to count for CVC investments for each company *i*, I take the aggregate count of investments in year *t*.

4.3. Environmental Munificence

Many researchers use continuous variables like total employment, price-cost margin, industry growth rate, or industry sales to quantify environmental munificence (Park & Mezias, 2005). In this study, I use sales growth to operationalize the prevalence of munificence in industry settings. I obtain industry sales from Compustat using the methods of Keats & Hitt (1988). For each industry, I use the five-year average growth in net sales for the relevant time period. After that, I run a time-series regression with time as the independent variable, using the natural logarithm of all annual figures across all enterprises in each relevant industry. The antilogs of the obtained regression slope coefficient are used to capture the growth rate of industry sales in order to indicate the presence of munificence in each industry environment (Keats & Hitt, 1988; Sahaym et al., 2010).

$$y_t = \alpha_0 + \alpha_1 * \mathrm{t} + \varepsilon_t \mathrm{x}$$

To test hypotheses 2 and 6, environmental munificence is utilized as an independent variable. Environmental munificence is utilized to estimate firm value as a main effect as well as in two- and three-way interaction terms with CVC activity and operational structure.

4.4 Operational Structure

Following the same approach of Titus Jr. & Anderson (2018), A modified Herfindahl index was used to assess operational structure. Scholars are increasingly using the index to measure within-firm concentrations of product portfolios or company operations (see, for example, Acar & Sankaran, 1999; Danzon, Nicholson, & Pereira, 2005; Henderson & Cockburn, 1996). Business sector revenues show the concentration of a firm's operations, much as market share reflects the concentration of an industry. Sales data for each business segment reported for each firm in each year of the study period were used to determine operational structure.

It's crucial to talk about operational structure in the context of the continuum presented here, as well as its relationship to a more traditional diversification idea (Robins & Wiersema, 2003). Prior to 1998, all publicly traded companies were required to report each industry in which they made 10% or more of their total sales. The entropy and concentric indices useful in diversification research are based on such data (Robins & Wiersema). Firms were obliged to report each business segment that generated 10% or more of gross revenue or contained 10% or more of total assets after the United States Securities and Exchange Commission (SEC) implemented rule SFAS N.131 in 1997.

Under the new rules, a company could divide its business segments by industry, market, region, or a combination of those factors, and restructure them as needed. As a result, firm diversification along industry lines is no longer allowed under current accounting standards, as it was previously. However, reported business sectors indicate how the company has organized its operations around independent profit and loss responsibilities and thus strategic control (Kumar, 2009). As a result, I refer to the idea as operational structure, which I define as a spectrum ranging from operationally concentrated on the high end to operationally diffuse on the low end.

I divided the amount of each reported business segment sales by the firm's gross revenue, then squared and summed the resulting values to create the variable for firm *i* at time *t*. Higher numbers imply a more concentrated operational structure, whilst lower values indicate a more scattered operational structure.

4.5 Industry Similarity

I build business similarity, which assesses the degree of relatedness in the core business of the partners, based on the SIC codes of the enterprises and their funding firms. The four-digit SIC code that overlaps between the investor and its funded firm is used to determine business similarities. In the case of a matching SIC code, this index is 1; in the case of a wholly different SIC code, it is 0. If the parent company made more than one investment in year *t*, then the variable industry similarity is measures as a weighted average of the number of investments in that specific year. Previously, very comparable measures of industry relatedness were extensively utilized in research.

4.6. Geographic Proximity

It is calculated using the North America Metropolitan Statistical Area (MSA), which is a variable that captures the firm's and company's geographical operating location. If both the company and the venture capitalist are located in the same geographic area, the value is 1, otherwise it is zero. Following the same methodology used for the variable industry similarity, also for geographic proximity, in case the CVC investor concluded more than one investment in a specific year *t*, then the measure utilized for geographic proximity is the weighted average of the number of investments performed in year *t*.

4.7. Control Variables

To reduce particular impacts within businesses and industries, this study controls for several firm- and industry-level variables. Compustat was used to obtain this data.

In particular, I use *firm size, financial slack, sales growth rate, firm liquidity, firm leverage, ROE, R&D Intensity* and *Industry Q* as controls in this study.

The natural logarithm of each company's annual net sales in the focal period is used to calculate *firm size (Size),* which accounts for size impacts as a predictor of firm performance. Size impacts attributable to businesses' scope and scale on external venturing activities are also

parsed out by incorporating a control for firm size. According to the Behavioral theory of the firm, *financial slack (Slack)* increases a firm's stability and adaptability, and hence has a beneficial impact on firm performance and value (Miner, 2006). Furthermore, a high-slack workplace is conducive to innovation, whereas organizations with little slack are more conservative (Sahaym et al., 2010). As a result, it is also controlled for slack, which is defined as a company's debt-to-equity ratio (Bromiley, 1991; Luger, 2014). Furthermore, I account for the rate of *sales growth (Growth)*, as this can affect Tobin's Q as well as the firm's CVC activity (Dushnitsky & Lenox, 2006). Growth is measured by calculating the growth on the annual sales. Additionally, I control for *firm liquidity (Liquidity)*, which is assessed by the current ratio, a formula that compares the firm's current assets to current liabilities and is a metric of excess and uncommitted resources (Basu et al., 2011). Firms with more liquidity can put more resources to CVC without having to make internal concessions (Dushnitsky & Lenox, 2005a). The ratio of a company's total debt to its total assets is known as *firm leverage (Leverage)* (Hoskisson et al., 2002). Firms that use a lot more leverage may not have the capacity or are hesitant to pursue CVC since they are likely to be financially stressed by interest and principal repayments (Zahra, 1991). In line with the literature, I calculate *R&D intensity (R&D)* as R&D expenses divided by net sales, according to Cohen & Levinthal (1990). Compustat was used to collect the data for this analysis. Recent dividend research suggests that the dividend policy of financially strained companies can be used to send a good signal to the financial markets (Kim, Yang et al., 2020). By extending those studies, I want to demonstrate that companies with higher payout ratios can achieve higher firm valuations, due to the positive signal that is sent to the market. To account for industry factors, I adopt Dushnitsky & Lenox (2006) and Titus & Anderson (2018)'s methodology of using the mean level of Tobin's Q for each industry in the model, called *Industry Q*.

5. Methodology

In my analysis, I conduct five regressions to test the effect of CVC activity, environmental munificence and operational structure on firm value. I also test whether there is a contingency effect between CVC investments, environmental munificence and operational structure on parent firm value. Moreover, in Model 5 I test the effect of industry similarity and geographic proximity on the firm value using the same methodology of previous tests, while in Model 6 I

study the effect of industry similarity and geographic proximity on firm value in a regression model without control variables.

In the regressions, I use year-fixed effects to control for many firm-specific factors, such as industry dummies and changing economic conditions over time. To control for unobserved heterogeneity, a significant Hausman test statistic showed that a fixed effect specification was recommended over a random effect specification (Wooldridge, 2010). In this case, fixed-effects models are better appropriate for obtaining consistent coefficient estimates from the supplied data. To control the influence within each industry, industry dummy variables are added to the regressions. To minimize endogeneity and omitted variables issues, fixed-effect estimations are used in the models, relying on the eventual connection between the fixed, unobservable part of the error term and some explanatory variables (Prior et al, 2008).

5.1. The Impact on Firm Value

Firstly, I focused on the impact of CVC activity, environmental munificence and operational structure on firm value, following the methodology of Titus and Anderson (2018). Doing so, I created the first regression model. The first model studies the impact of CVC activity, environmental munificence and operational structure on firm value to test hypotheses 1,2,3 and 6 as follows:

$$Firm\ Value_{it} = \alpha + \beta_1 CVC_{it} + \beta_2 OS_{it} + \beta_3 EM_{it} + \beta 4(CVC \times OS_{it}) + \beta 5(CVC \times EM_{it}) + \beta 6(OS \times EM_{it}) + \beta 7(CVC \times OS \times EM_{it}) + \beta_8 Size_{it} + \beta_9 Slack_{it} + \beta_{11} Growth_{it} + \beta_{12} Liquidity_{it} + \beta_{13} Leverage_{it} + \beta_{14} ROE_{it} + \beta_{15} R\&D_{it} + \beta_{16} Industry\ Q_{it} + \delta_i + \gamma_t + \varepsilon_{it} \quad (1)$$

In equation (1), I conduct time-series cross-sectional models to forecast firm value *i* at time *t* using a dataset from 2000 to 2020, where CVC = CVC investments, OS = operational structure and EM = environmental munificence. In equation (1), δ is a firm-level fixed effect, γ is a year fixed effect and ε is the residual term.

6. Results

6.1. Descriptive statistics

Table 1 reports the descriptive statistics for the variables used for this study for the time span from 2000 to 2020.

The average of CVC investments is 1.70 and, as expected, is a very low value; however, the standard deviation of 3.74 shows that there is a considering variation of the amount of CVC activities in which companies engage in. Tobin's Q has a mean value of 1.62, which suggests that the sample companies' market valuation is 1.62 times bigger than their intrinsic value on average, with a standard deviation of 1.2. For operational structure, which indicates the aggregate count of business segments using a Herfindahl Index, the mean is 0.60 and the standard deviation is 0.19. I found that environmental munificence has a mean of 1.27 and a standard deviation is 0.56.

Overall, the findings show that companies are dedicated to CVC investment activities on average and obtain market valuations that are multiples higher than their real values. Companies are not excessively levered on average, with a mean of 0.44 and a standard deviation of 0.14, and generate positive returns with a mean of 0.04 and a standard deviation of 0.05, according to financial and accounting statistics.

Table 2

Descriptive Statistics

	Mean	Std. Dev.	Min	Max	Skew.	Kurt.	N
1. Firm value	1.62	1.20	0.00	11.05	2.27	10.89	1989
2. Industry Q	1.60	0.88	0.30	4.09	0.77	2.80	1989
3. Firm Size	8.69	1.88	0.26	12.86	-0.60	3.41	1989
4. Return on Equity	0.04	0.05	-0.31	0.13	-2.80	16.03	1989
5. Sales growth rate	0.07	0.11	-0.21	0.38	0.22	3.24	1989
6. R&D intensity	0.61	0.19	0.00	0.69	0.18	1.87	1989
7. Leverage	0.44	0.14	0.00	0.72	0.50	0.08	1989
8. Financial Slack	0.45	0.20	0.00	0.80	0.02	1.79	1989
9. Industrial Similarity	0.19	0.30	0.00	1.00	1.48	0.79	372
10. Geographic Prox.	0.15	0.29	0.00	1.00	2.02	2.98	372
11. Firm Liquidity	1.66	0.73	0.00	3.01	0.09	1.83	1989
12. CVC investments	1.70	3.74	0.00	117.00	2.55	15.55	1989
13. Op. structure	0.60	0.19	0.10	1.00	0.25	2.01	1989
14. Env. Munificence	1.27	0.56	0.39	2.09	-1.24	4.40	1989

The table above reports the main descriptive statistics on the dependent variable, independent variables and control variables for 2000-2020.

6.2. Correlation Results

Table 3 shows the Pearson correlation matrix for all the variables used in my study for the time frame from 2000 to 2020.

CVC investments and firm value are positively correlated (0.08), meaning that higher number of CVC investments importantly affects the value of the parent firm. Also, operational structure is positively linked to firm value (0.19), while environmental munificence is negatively correlated to Tobin's Q (-0.08). The findings show that leverage is slightly positively correlated with both CVC activity (0.11) and Tobin's Q (0.06), implying that firms with higher leverage have higher firm value and engage in more CVC investment activities. Moreover, the correlation coefficients suggest that firm size is negatively correlated to firm value (-0.02) and negatively correlated to CVC activity (-0.05). This finding implies that smaller companies are less valuable than larger companies, and that smaller companies engage in more CVC activities. Slack resources, which were expected to encourage CVC activity, are also inversely correlated with CVC investing activity (-0.20) and firm value (-0.13). Liquidity is also strongly positively

correlated with CVC activity (0.21) and Tobin's Q (0.21), indicating that companies with higher liquidity have more CVC activity and are valued higher. Moreover, growth with CVC activity (0.17) and Tobin's Q (0.28) exhibit a positive correlation, indicating that growing firms have higher CVC investing activities and firm valuations.

Table 3

Correlation Matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	Firm value	1.00													
2.	Industry Q	0.70	1.00												
3.	Firm Size	-0.02	-0.05	1.00											
4.	ROE	-0.12	-0.14	0.26	1.00										
5.	Sales Growth R.	0.28	0.17	-0.16	-0.03	1.00									
6.	R&D intensity	0.35	0.33	-0.29	-0.31	0.17	1.00								
7.	Leverage	0.06	0.11	0.06	-0.01	-0.09	-0.14	1.00							
8.	Financial Slack	-0.13	-0.20	0.12	-0.01	-0.09	-0.19	0.81	1.00						
9.	Ind. Similarity	0.23	0.34	-0.14	-0.15	0.16	0.28	-0.17	-0.22	1.00					
10.	Geo. Prox.	0.05	0.01	-0.04	0.04	-0.04	0.06	-0.06	-0.04	-0.04	1.00				
11.	Firm Liquidity	0.21	0.21	-0.34	-0.09	0.10	0.40	-0.16	-0.24	0.12	0.04	1.00			
12.	CVC	0.08	0.08	0.12	-0.00	0.06	0.05	-0.08	-0.07	0.01	0.04	0.05	1.00		
13.	Op. structure	0.19	0.08	-0.41	-0.11	0.17	0.28	-0.02	-0.05	0.05	-0.05	0.26	0.00	1.00	
14.	EM	-0.08	0.11	0.50	0.02	-0.06	0.24	-0.02	0.02	0.18	-0.03	-0.09	0.05	-0.17	1.00

The table reports the correlations between dependent variables, independent variables and control variables for the time period from 2000 to 2020. N = 1.989; number of firms = 159.

6.3. Regression Results

6.3.1. The effect of CVC investments, environmental munificence and operational structure on firm value

Table 4 shows the outcomes of our hypothesis 1,2,3 and 6 tests, as calculated by Cohen et al. (2003) to develop equation (1) cumulatively. Model 1 only includes the control variables, Model 2 shows the main effect of CVC investments, operational structure and environmental munificence on firm value, Model 3 tests our two hypothesized two-way interactions CVC x OS and CVC x EM, with OS x EM and the three-way interaction missing, and Model 4 tests the full study model given in equations (1).

In Model 1, we can see that Industry Q ($\beta = 0.492$; $p < 0.01$), R&D Intensity ($\beta = 2.441$; $p < 0.01$) and Firm Liquidity ($\beta = 0.234$; $p < 0.01$) are statistically significant at a 1% significant level and all with a positive coefficient, while Sales Growth Rate ($\beta = 0.465$; $p < 0.05$) is statistically significant at a 5% significant level. These variables have a strongly positive interaction with Tobin's Q, with a particular interest for R&D Intensity and Firm Liquidity, meaning that increasing R&D intensity and liquidity, the firm value also increases.

In Model 2, I analyze the impact of the CVC activity, operational structure and environmental munificence on Tobin's Q. In Hypotheses 1, 2 and 3, I state that CVC investments, operational concentration and a low diffuse environmental munificence increase the parental firm value. Model 2 provides the evidence for these finding, as the coefficients of CVC Investments ($\beta = 0.104$; $p < 0.01$) and Operational Structure ($\beta = 0.232$; $p < 0.01$) on firm value are significantly positive at a 1% significance level, while the coefficient of Environmental Munificence ($\beta = -0.049$; $p < 0.01$) on firm value is significantly negative at a 1% significance level. As the results presented in the regression in Model 1, Industry Q ($\beta = 0.197$; $p < 0.01$) R&D Intensity ($\beta = 0.893$; $p < 0.01$) Firm Liquidity ($\beta = 0.136$; $p < 0.01$) and Sales Growth Rate ($\beta = 0.271$; $p < 0.05$) still have a strongly significant positive interaction with the dependent variable.

The impact of the two-way interaction terms between CVC activity-operational structure and between CVC activity-environmental munificence on firm value is examined in Model 3, that adds in the model the interactions CVC x OS and CVC x EM. Here, at a 1% significance level, I find a significant negative interaction of CVC and environmental munificence ($\beta = -0.040$, p 0.01) and a significant positive interaction of CVC and OS ($\beta = 0.139$, p 0.05) in the relationship with firm value. The interaction between CVC activity and environmental munificence has a negative coefficient, implying that lowering environmental munificence enhances the link

between CVC activity and firm value. This finding backs up Titus and Anderson's (2018) results, which show a large drop in firm value when companies make CVC investments in industries with high environmental munificence. Furthermore, the positive coefficient for the interaction term between CVC activity and operational structure shows that when operationally concentrated companies undertake CVC investments, their value increases. I provide further evidence to support Titus and Anderson's (2018) thesis that parent firm value grows when operationally concentrated firms invest in CVC. In fact, my findings support Titus & Anderson (2018)'s findings, which show that when operationally concentrated firms undertake CVC investments, parent firm value rises. Indeed, when organizations with a concentrated operational structure engage in CVC activity – without looking at other contingencies – I find that company value improves. In fact, Model 3 presents the independent variables that form the interactions all statistically significant at a 1% level: CVC Investments ($\beta = 0.163$; $p < 0.01$), Operational Structure ($\beta = 0.442$; $p < 0.01$) and Environmental Munificence ($\beta = -0.872$; $p < 0.01$). Moreover, in this model control variables Industry Q ($\beta = 0.163$; $p < 0.01$), R&D Intensity ($\beta = 1.168$; $p < 0.01$), Firm Liquidity ($\beta = 0.118$; $p < 0.01$) and Sales Growth Rate ($\beta = 0.188$; $p < 0.01$) continue to have a strongly significant positive interaction with Tobin's Q.

My findings imply that CVC activity among operationally concentrated firms boosts firm valuation. Moreover, companies that engage in CVC activity collects negative gains when they operate in industries with high level of environmental munificence.

In Model 4, I test the full equation (1), adding the two-way interaction OS x EM and the three-way interaction to the study model. In this analysis, I find that the three-way interaction CVC x OS x EM has a positive coefficient and is statistically significant at a 1% level ($\beta = 0.013$; $p < 0.01$), demonstrating my Hypothesis 6. Again here, we can see that the variable CVC investments ($\beta = 0.115$; $p < 0.01$) and Operational Structure ($\beta = 0.465$; $p < 0.01$) are positive and statistically significant at a 10% level, while Environmental Munificence ($\beta = -0.671$; $p < 0.01$) is negative and statistically significant at a 1% level, confirming also in this model my Hypotheses 1, 2 and 3. Here, we can also observe that the interaction between CVC investments and operational structure is positive and statistically significant at a 1% level ($\beta = 0.095$; $p < 0.01$) and that the interaction between environmental munificence and CVC investments is negative statistically significant at a 1% significance level ($\beta = -0.025$; $p < 0.01$), strengthening the findings of the previous model. Talking about control variables, the same variables that were statistically significant in the previous models continued the trend: Industry Q ($\beta = 0.163$; $p < 0.01$), R&D Intensity ($\beta = 1.148$; $p < 0.01$), Firm Liquidity ($\beta = 0.117$; $p < 0.01$) and Sales Growth Rate ($\beta = 0.190$; $p < 0.01$).

Table 4

Effect of CVC Activity, Environmental Munificence and Operational Structure on Firm Value

	Model 1		Model 2		Model 3		Model 4	
	b	**S.E.**	**b**	**S.E.**	**b**	**S.E.**	**b**	**S.E.**
Industry Q	0.492***	0.062	0.197***	0.035	0.163***	0.025	0.163***	0.025
Firm Size	-0.051	0.0833	0.004	0.034	0.002	0.022	0.004	0.022
Return on Equity	-0.233	0.364	0.166	0.184	-0.114	0.118	-0.134	0.118
Sales growth rate	0.465**	0.211	0.271**	0.105	0.188***	0.068	0.190***	0.066
R&D intensity	2.441***	0.216	0.893***	0.117	1.168***	0.086	1.148***	0.085
Leverage	0.026	0.075	-0.0167	0.055	-0.039	0.045	-0.034	0.044
Financial Slack	-0.071	0.075	-0.049	0.038	0.005	0.027	0.002	0.027
Firm Liquidity	0.234***	0.024	0.136***	0.018	0.118***	0.012	0.117***	0.012
CVC investments			0.104***	0.008	0.163***	0.016	0.115***	0.020
Operat. structure			0.232***	0.076	0.442***	0.265	0.465***	0.267
Env. Munificence			-0.049***	0.019	-0.872***	0.132	-0.671***	0.149
CVC x OS					0.139***	0.105	0.095***	0.012
CVC x EM					-0.040***	0.005	-0.025***	0.007
OS x EM							0.051	0.019
CVC x OS x EM							0.013***	0.004
Constant	2.560***	0.835	2.692***	0.388	3.246***	0.403	3.111***	0.423
Firm fixed effect	Yes		Yes		Yes		Yes	
Year fixed effect	Yes		Yes		Yes		Yes	
R^2 (Within)	0.578		0.586		0.608		0.629	

*The table presents results from fixed effects regressions of the CVC, EM as well as the OS proxies and control variables on firm value over the period of 2000-2020 with year and industry dummies for the whole sample. Model 1 only includes the control variables. In Model 2 the main effect of CVC, EM and OS is added. Model 3 contains also the two-way interaction terms CVC x OS and CVC x EM. In Model 4 the last two-way interaction OS x EM and the three-way interaction term of CVC, EM and OS are added. The p values are given in brackets and are two-tailed. The symbols ***, ** and * represent the significance level at the 1%, 5%, and 10%, respectively.*

6.3.2. The effect of industry similarity and geographic proximity on firm value

As a last analysis, I extended the above regression model by including other two independent variables that have already been presented before – industry similarity and geographic proximity. The addition of new variables narrows the data set and counts now 372 observations, but it still covers the period from 2000 to 2020. The results of equation (2) are presented in Table 5, where Model 5 includes all the variables and interactions of the previously analyzed Model 4, adding the effects of the industry similarity (IS) and geographic proximity (GP) to the model in this way:

$$Firm\ Value_{it} = \alpha + \beta_1 CVC_{it} + \beta_2 OS_{it} + \beta_3 EM_{it} + \beta 4(CVC \times OS_{it}) + \beta 5(CVC \times EM_{it}) + \beta 6(OS \times EM_{it}) + \beta 7(CVC \times OS \times EM_{it}) + \beta_8 Size_{it} + \beta_9 Slack_{it} + \beta_{10} Growth_{it} + \beta_{11} Liquidity_{it} + \beta_{12} Leverage_{it} + \beta_{13} ROE_{it} + \beta_{14} R\&D_{it} + \beta_{15} Industry\ Q_{it} + \beta_{16} IS_{it} + \beta_{17} GPit + \delta_i + \gamma_t + \varepsilon_{it} \quad (2)$$

As we can see from Table 5, both variables Industry Similarity and Geographic Proximity are not statistically significant, probably due to a very high number of variables present in the model, of which most of them are statistically significant at a 1% significance level and already explain the dependent variable Tobin's Q. Following this methodology, I cannot find supports for my Hypotheses 4 and 5 in this model.

Table 5

Effect of industry similarity and geographic proximity on firm value

	Model 5	
	ß	S.E.
Industry Q	0.163***	0.025
Firm Size	0.004	0.022
Return on Equity	-0.135	0.117
Sales growth rate	0.191***	0.066
R&D intensity	1.149***	0.086
Leverage	-0.035	0.044
Financial Slack	0.003	0.027
Firm Liquidity	0.117***	0.012
CVC investments	0.115***	0.020
Operational structure	0.486***	0.267
Environ. Munificence	-0.672***	0.149
Industry Similarity	0.083	0.129
Geographic Proximity	0.107	0.132
CVC x OS	0.095***	0.012
CVC x EM	0.025***	0.007
OS x EM	0.031	0.019
CVC x OS x EM	0.013***	0.004
Intercept	3.117***	0.435
Firm fixed effect	Yes	
Year fixed effect	Yes	
R^2 (Within)	0.711	

*The table presents results from fixed effects regressions of the CVC, EM, OS as well as the Industry Similarity and Geographic Proximity proxies and control variables on firm value over the period of 2000-2020 with year and industry dummies for the whole sample. Model 5 reports all the interactions and terms of equation (2). The p values are given in brackets and are two-tailed. The symbols ***, ** and * represent the significance level at the 1%, 5%, and 10%, respectively.*

Since in Model 5 the variables industry similarity (IS) and geographic proximity (GP) are not statistically significant, I then tried to analyze the effects of the interactions between these two variables and the other independent variables object of this study, namely CVC Investments (CVC), Operational Structure (OS) and Environmental Munificence (EM). Doing so, I created

other seven interactions, that I included in Equation (3): CVC x IS, OS x IS, EM x IS, CVC x GP, OS x GP, EM x GP and IS x GP. In this analysis, I excluded control variables to better analyze the effect of the variables of interest on firm value.

$$Firm\ Value_{it} = \alpha + \beta_1 CVC_{it} + \beta_2 OS_{it} + \beta_3 EM_{it} + \beta_4 IS_{it} + \beta_5 GP_{it} + \beta_6 (CVC \times IS_{it}) + \beta_7 (OS \times IS_{it}) + \beta_8 (EM \times IS_{it}) + \beta_9 (CVC \times GP_{it}) + \beta_{10} (OS \times GP_{it}) + \beta_{11} (EM \times GP_{it}) + \beta_{12} (IS \times GP_{it}) + \delta_i + \gamma_t + \varepsilon_{it} \quad (3)$$

Table 6 shows the effect of Industry Similarity, Geographic Proximity, CVC Investments, Operational Structure, Environmental Munificence and their respective interactions on Tobin's Q in a time-series cross-sectional regression.

As we can see from the table below, if I remove the control variables from the model, the R^2 of the model decreases and the variables Industry Similarity (β=0.182; $p<0.05$) and Geographic Proximity (β=0.215; $p<0.1$) become, respectively, statistically significant at a 5% and 10% significance level. The relationship between firm value and industry similarity is positive, indicating that entrepreneurial ventures with a similar business similar to the one of the CVC investors grow the firm value of the parent firm, due to specific synergies arising from similar technology used that will boost its innovation, supporting the findings of Cassiman et al (2005). Also, the positive relationship between firm value and geographic proximity suggests that new ventures based in the same metropolitan area of the parent firm increase its firm value, because parent companies can beneficiate from more innovative and dynamic resources of the new ventures in the same local market (e.g. product, team, technology), increasing the marginal value of a CVC investment: this finding is in opposition to the ones of Peri (2005) and Matray (2021) and gives new space for further research. Therefore, in this model I find support for the hypotheses 4 and 5 of my study. Moreover, the two-way interactions between Industry Similarity and Operational Structure (β=0.562; $p<0.05$), Industry Similarity and Environmental Munificence (β=-0.032; $p<0.05$) and Geographic Proximity-Operational Structure (β=0.012; $p<0.05$) are also statistically significant at a 5% significance level. CVC investments (β=0.138; $p<0.01$) Operational Structure (β=0.136; $p<0.01$) and Environmental Munificence (β=-0.192; $p<0.01$) are, as in previous models, statistically significant at a 1% significance level.

Table 6

Effect of interactions between industry similarity and geographic proximity with CVC, OS and EM on firm value

	Model 6	
	ß	S.E.
CVC investments	0.138***	0.030
Operational structure	0.136***	0.622
Environ. Munificence	-0.192***	0.316
Industry Similarity	0.182**	0.131
Geographic Proximity	0.215*	0.133
CVC x IS	0.203	0.465
OS x IS	0.562**	0.376
EM x IS	-0.032**	0.026
CVC x GP	-0.107	0.055
OS x GP	0.012**	0.017
EM x GP	-0.481	0.079
IS x GP	0.097	0.381
Intercept	2.910***	0.943
Firm fixed effect	Yes	
Year fixed effect	Yes	
R^2 (Within)	0.530	

*The table presents results from fixed effects regressions of the CVC, EM, OS as well as the Industry Similarity and Geographic Proximity and their respective interactions proxies on firm value over the period of 2000-2020 with year and industry dummies for the whole sample. The p values are given in brackets and are two-tailed. The symbols ***, ** and * represent the significance level at the 1%, 5%, and 10%, respectively.*

7. Robustness Analysis and Additional Tests

To be sure my findings are solid, I run them through a series of robustness tests. To reduce the risk of making a Type-1 error, I utilize robust standard errors to see if standard errors are impacted and if t- and p-values are still significant for the results I have provided. In addition, I incorporate fixed effects in the models to account for unobserved variance, which can alter the outcomes (Antonakis et al., 2010). I also use a two-stage least squares (2SLS) technique to deal with the issue of possible endogeneity, which might include the relationship between CVC activity and firm value. Moreover, to calculate variance inflation factors (VIFs), I first estimated a fixed-effect ordinary least squares (OLS) model; VIF values were below the

suggested 10.0 cutoff (model VIF < 1.7; see Hair, Anderson, Tatham, & Black, 1998), mitigating concerns about non-essential multicollinearity. It is not required to estimate a 2SLS model with instrumental factors in the interaction terms, according to Semadeni et al. (2014) and Titus & Anderson (2018), because they handle the problem of endogeneity in the direct effect. I utilize one-year lagged CVC Investments as an instrumental variable for CVC Investments, as suggested by Basu et al. (2011). Lagged values of endogenous variables are exogenous, according to Kennedy (2008), because they are predefined constants in determining the endogenous variable's present period values. Reverse causality is reduced by using a one-year lag between the independent and dependent variables.

The instrumental variable is a significant predictor ($\beta = 0.027$; $p < 0.01$) of the presumed endogenous variable in the first-stage regression, as evidenced by a significant p-value (Stock et al., 2002). I utilize the Cragg- Donald test in the second-stage equation to see if the instruments I'm employing in the model are indeed defining the endogenous model. I show that the model has a significant F-statistic (Andrews & Stock, 2005; Stock et al., 2002). The robust standard errors test for Hypothesis 1 shows that CVC investments have an insignificant positive connection with firm value ($\beta= 0.131$; $p > 0.1$). The significantly positive relationship of operational structure on firm value ($\beta= 1.097$; $p < 0.05$) as well as the significantly positive relationship of the interaction term of CVC and OS on firm value ($\beta = 14.472$; $p < 0.05$) are both confirmed by testing robust standard errors for the results of Hypothesis 2. According to the results of Hypothesis 3, which were also given for robust standard errors, environmental munificence has a significant negative effect on firm value ($\beta = -0.083$; $p < 0.1$).

As a result of Hypothesis 6, the three-way interaction term ($\beta = 0.395$; $p < 0.05$) remains significantly correlated to Tobin's Q, although the effect of CVC activity on firm value becomes insignificant. The two-way interactions of CVC activity and environmental munificence ($\beta = -0.483$, $p < 0.1$) and operational structure with environmental munificence ($\beta = -0.671$, $p < 0.05$) remain significantly negative related to Tobin's Q. As an output of my robustness checks on Hypotheses 4 and 5, I obtain that both variables industry similarity ($\beta = 0.021$; $p > 0.1$) and geographic proximity ($\beta = 0.018$; $p > 0.1$) have non-significant effects on TQ. My findings show how variables like environmental munificence, CVC investments, and operational structure interact with firm value, according to the robustness tests.

8. Conclusions

The lack of a comprehensive understanding of the various elements that influence firm value, as well as the relationship between CVC activity, operational structure, environmental munificence, and firm value, prompted this study. This study examines the association between CVC activity and firm value using a US-American panel dataset of 1.989 firm-year observations spanning the years 2000 to 2020. In addition, the impact of industry similarity and geographic proximity on company value is examined in this study. The analysis takes into account industry-specific elements such as environmental munificence, as well as firm-specific factors such as operational structure. I employ a large number of control variables in fixed-effects regressions.

In my study, I look at how operational structure and environmental munificence effect parent business valuation among CVC investors. In my sample, I find that CVC activity has a positive and significant effect on firm value, supporting the findings of Dushnitsky & Lenox (2006), who found that firms that engage in CVC activities create more value and that greater CVC investment raises firm value. In addition, I've noticed a large drop in firm value when companies make CVC investments in industries with high environmental munificence. Furthermore, I believe that when operationally concentrated organizations invest in CVC, their value increases. I also analyzed how the three-way interaction between CVC investments, operational structure and environmental munificence affects the parent firm value. As in the model all the variables that form the interaction are statistically significant, I found that the three-way interaction between CVC investments, operational structure and environmental munificence is statistically significant with a slightly positive coefficient and, thus, affecting positively the parental firm value that makes CVC investments.

Further, I looked at how the industry similarity and geographic proximity between CVC investors and company invested affect the firm value of the parent company. In Model 5, my test provides insignificant results, since the coefficients of these independent variables are not statistically significant, probably due to the elevate number of control variables implemented. I then plotted all the possible two-way interactions between industry similarity, geographic proximity, CVC investments, operational structure and environmental munificence to further study the relationship between these variables and to see if they provide a statistic explanation to the firm value, following equation (3) model without all the control variables implemented in the previous models. Here, I found that industry similarity and geographic proximity have both positive coefficients that are statistically significant for the explanation of the parent firm

value. Therefore, I believe that when organizations invest in new ventures with a similar business or that are located in the same metropolitan area, their value rises. In this last model, I discovered that also the two-way interactions between industry similarity and operational structure, industry similarity and environmental munificence and between geographic proximity and operational structure are statistically significant and can help to explain the parent firm value.

9. Limitation and Future Research Directions

The research builds on prior research with major additions. The research is expanded by examining the impact of industry-specific concepts like environmental munificence and firm-specific capabilities like operational structure on firm value for US-American listed companies, with more updated information, as well as providing an indication of the relationship between industry similarity and geographic proximity (between parent firm value and the entrepreneurial venture).

As already stated by Titus & Anderson (2018), also my research design prevents the capacity to draw a direct causal inference between CVC investments and firm value, despite the fact that my analysis is a cautious approach given the data provided. One of the challenges in this type of analysis is that the valuation of publicly traded companies is influenced by a variety of factors, some of which are within the firm's control and others which are exogenous to it, and controlling for all possible confounds is both empirically and practically impossible. As a result, readers should see my findings within the lens of adding to the broader discourse about the theoretical and empirical validity for the a priori concept that CVC investments impact performance independently. Then, more research is needed into the specific characteristics of the entrepreneurial venture and the parent firm, as it is still unknown how those characteristics influence the relationship between the venture and the firm, as well as whether the CVC activities conducted result in successful innovations and increased firm value.

On the one hand, the current study serves as a foundation for understanding the impact of various factors on CVC activity, and on the other hand, the interaction between CVC activity, environmental munificence, and operational structure on firm value. However, it has a certain number of limitations, which I'll leave to future research to address. One constraint is the number of years used in my sample for calculating the industry similarity and geographic proximity variables, as these variables are related to CVC activity and are only useful when this

last variable is not equal to zero. Furthermore, I recognize that utilizing Tobin's Q as a mean for firm value is dependent on the assumption that investors and capital markets price businesses' securities sensibly. Another restriction of this research was the lack of access to datasets such as VentureXpert and Thomson Reuter's Institutional Holdings 13F. As a result, data had to be handled and prepared manually, which increased the risk of data handling errors. Due to the previously described database access limitation, several suitable control variables could not be retrieved. According to corporate governance literature, dedicated and transient shareholders, for example, have an impact on Tobin's Q. Furthermore, I utilize the total number of CVC investments to track CVC activities. In addition, depending on the value of CVC investments, I used the weighted average to calculate industry similarity and geographic proximity. As noted in the section dedicated to the description of the variables, research has employed a variety of methods to operationalize CVC activity. As a result, it would be beneficial for future study to test the consistency of my findings using multiple datasets. Future study should focus on how companies integrate, use, and convert the knowledge and know-how they have gained from their CVC activities. Finally, future research could also look into whether different attentional structures direct managerial attention to different types of activities or influence the efficacy of those activities in different ways. Operationally diffuse firms, for example, may have more success with international expansion than operationally concentrated enterprises, implying that operational diffusion is a better fit for some contexts than operational concentration.

Appendix

Table 7

Observations by Year and Industry

Year	10	12	13	17	20	26	27	28	29	35	36	37	38	39	46	47	48	49	50	51	56	57	58	59	60	61	62	63	65	67	70	73	75	80	82	87	99	Total
2000	0	2	4	0	4	2	2	13	1	15	26	3	15	0	0	1	18	10	3	3	1	1	1	4	6	4	5	7	2	10	2	61	1	3	1	5	6	242
2001	0	2	3	0	4	2	2	13	1	16	26	3	14	0	0	1	17	10	3	2	1	1	1	4	7	4	6	8	2	8	2	59	1	3	1	5	6	238
2002	0	2	3	0	4	2	2	13	1	16	24	3	14	0	0	1	16	10	3	2	1	1	1	4	7	4	6	8	2	8	2	59	1	3	1	5	5	234
2003	0	2	4	0	4	2	2	13	1	16	24	3	14	1	0	1	15	11	3	2	1	1	1	4	7	4	5	8	1	9	2	57	1	3	1	5	5	233
2004	0	2	4	0	4	2	2	13	1	16	23	3	14	1	1	1	16	10	3	2	1	1	1	4	6	4	5	8	1	9	2	55	1	3	1	5	5	230
2005	0	2	4	0	4	2	2	13	1	16	24	3	15	1	1	1	14	10	3	2	1	1	1	4	6	4	5	8	2	8	2	52	1	3	1	3	6	226
2006	0	2	4	0	4	2	1	13	1	15	25	3	14	1	1	1	12	10	3	2	1	1	1	4	7	5	5	8	2	13	2	48	1	3	1	4	7	227
2007	0	2	3	0	4	2	2	13	1	15	25	3	12	1	1	0	12	8	3	2	1	1	1	4	7	5	5	8	2	16	2	48	1	3	1	2	7	223
2008	1	2	4	1	4	2	2	14	1	16	25	3	12	1	1	0	12	8	3	2	1	1	1	4	7	5	4	9	1	21	2	42	1	3	1	2	7	226
2009	1	2	3	1	4	2	2	12	1	15	25	3	11	1	1	0	11	8	3	2	1	1	1	4	7	5	4	9	1	23	2	38	1	3	1	2	6	217
2010	1	2	4	1	4	2	2	13	1	14	25	4	11	1	1	0	10	8	3	2	1	1	1	4	7	5	4	8	1	22	2	41	1	3	1	1	6	218
2011	2	2	4	1	4	2	3	13	1	14	24	4	11	1	1	0	9	7	3	2	1	1	1	4	7	5	4	8	2	27	2	40	1	3	1	1	6	222
2012	2	2	3	1	4	2	3	13	2	14	22	4	11	1	2	0	10	7	3	2	1	1	1	4	7	5	4	8	2	26	2	37	1	3	1	1	6	218
2013	2	2	2	1	4	2	3	13	2	14	21	4	11	1	2	0	11	7	3	2	1	1	1	4	6	5	4	8	2	29	2	36	1	3	1	1	6	218
2014	2	2	2	0	4	2	3	14	1	14	20	4	11	1	2	0	11	7	3	2	1	1	1	4	6	5	3	7	2	30	1	36	1	3	1	1	6	214
2015	2	2	2	0	4	2	2	15	1	14	19	3	11	2	2	0	12	7	3	2	1	1	1	4	6	4	3	7	2	17	1	32	1	3	1	1	5	195
2016	2	2	2	0	4	2	2	15	1	13	18	3	10	2	2	0	11	7	3	2	1	1	1	4	6	4	3	7	2	17	1	33	1	3	1	1	6	193
2017	2	2	2	0	4	2	2	14	1	12	18	3	10	2	2	0	10	7	3	1	1	1	1	4	6	4	4	7	2	17	1	32	1	3	1	1	7	190
2018	2	2	2	0	4	2	2	14	1	12	16	3	10	2	2	0	10	6	3	1	1	1	1	4	6	4	4	6	2	19	1	32	1	3	1	1	7	188
2019	2	2	2	0	4	2	2	13	1	12	16	3	11	2	2	0	9	6	3	1	1	1	1	3	6	4	4	6	2	19	1	30	1	3	1	1	7	184
2020	2	2	2	0	4	2	2	13	1	12	15	3	10	2	2	0	7	6	3	1	1	1	1	3	6	4	4	6	2	20	1	29	1	3	1	1	6	179
Total	**23**	**42**	**63**	**6**	**84**	**42**	**45**	**280**	**23**	**301**	**461**	**68**	**252**	**24**	**26**	**7**	**253**	**170**	**63**	**39**	**21**	**21**	**21**	**82**	**136**	**93**	**91**	**159**	**37**	**368**	**35**	**897**	**21**	**63**	**21**	**49**	**128**	**4515**

The table shows the distribution of investments across year and industries. The industries are assigned according to the Standard Industry Code (SIC) of the CVC investor.

Table 8

Definition of Variables

Variable	Explanation
CVC	CVC investments obtained from Thomson Financial's Securities Data Company Platinum. Aggregate count of corporate venture deals by each investor firm (Sahaym et al., 2010).
CVC*EM	Interaction variable multiplying CVC Investments with Environmental Munificence.
CVC*OS	Interaction variable multiplying CVC Investments with Operational Structure.
CVC*EM*OS	Interaction variable multiplying CVC Investments with Environmental Munificence and Operational Structure
EM	Industry sales obtained from Compustat database, using five-year average growth in net sales during the relevant time period for each industry. The natural logarithms across all firms were entered into a time-series regression and the antilogs of the regression slope coefficients were used to capture the growth rate of each industry (Keats & Hitt, 1988).

Geographic Proximity	It is calculated using the North America Metropolitan Statistical Area (MSA), which is a variable that captures the firm's and company's geographical operating location. If both the company and the venture capitalist are located in the same geographic area, the value is 1, otherwise it is zero. Following the same methodology used for the variable industry similarity, also for geographic proximity, in case the CVC investor concluded more than one investment in a specific year *t*, then the measure utilized for geographic proximity is the weighted average of the number of investments performed in year *t*.
Industry	Industry dummies.
Industry Q	Calculated as the average level of Tobin's Q for each two-digit SIC code industry in a given year.
Industry Similarity	I build business similarity, which assesses the degree of relatedness in the core business of the partners, based on the SIC codes of the enterprises and their funding firms. The four-digit SIC code that overlaps between the investor and its funded firm is used to determine business similarities. In the case of a matching SIC code, this index is 1; in the case of a wholly different SIC code, it is 0. If the parent company made more than one investment in year *t*, then the variable industry similarity is measures as a weighted average of the number of investments in that specific year.
Leverage	Leverage measured as total debt (including current) to total assets.
Liquidity	Liquidity measured as the firm's current assets to current liabilities (current ratio).
OS	Operational structure measured as a modified Herfindahl index, dividing the amount of each reported business segment sales by the firm's gross revenue, then squared and summed the resulting values to create the variable for firm *i* at time *t*.
OS*EM	Interaction variable multiplying Environmental Munificence with Operational Structure.
R&D Intensity	Measured as the ratio between R&D expenses divided by net sales.
ROE	Return on Equity measured as net income to total equity.
Sales Growth Rate	Sales growth rate, measured as the percentage change of annual net sales.
Size	Company size measured as the natural logarithm of annual net sales.
Slack	Slack measured as firm's debt-to-equity ratio.
TQ	Tobin's Q measured as the product of the sum of Market Value of Equity, preferred stock and debt divided by total assets (Chung & Pruitt, 1994).
Year	Year dummies.

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