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Are Corporate Venture Capitalists Better at Improving the
Portfolio Firms' Performances?
An Analysis of CVCs' Heterogeneity

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Abstract

Corporate venture capitalists play a vital role in the entrepreneurial finance ecosystem. They are able to provide critical value-adding activities to portfolio firms, but, on the other side, their captive nature exposes them to several drawbacks.

Prior literature provides ample evidence on the CVCs' impact on startups' performances. However, the results are often contrasting. The lack of an overarching view on the topic is strongly influenced by the heterogeneity characterising the CVCs market. We argued that different clusters of CVCs could provide different levels of supports to portfolio firms. Subsequently, leveraging on the organisational theory, we focused on understanding the interplay between the different heterogeneity dimension to detect an ideal profile of corporate venture capital. We considered a sample of 2848 Pan-European VC-backed startups and 112 worldwide CVCs.

We explore the different CVCs heterogeneity dimensions. The first one concerns the corporate venture funds' organisational structure. We classify CVCs in exoisomorph, i.e., CVCs adopting an IVC-like organisation, and endoisomorph, i.e., CVCs adopting a corporate-like organisation (Souitaris et al., 2012). We believe that exoisomorph guarantees a higher impact on startups considering the startup ecosystem high dynamicity. The second variable is CVCs' strategic orientation, as the dyad's relationship is based on fragile cooperation equilibrium (Katila et al., 2008). We classify CVCs' mission as strategic when it aims at increasing the parent's value, financial when it focuses on return on investments, and unfocused when it combines both strategic and financial goals (Rohm et al., 2017). Considering their value-adding role as an industrial partner, we argue that strategic CVCs have more incentives to support portfolio firms' growth. Consequently, we investigate the existence of an ideal CVC profile, i.e., a corporate venture fund achieving a fit between the organisational structure and the strategic objective. We believe such CVCs could have a more significant impact on portfolio firms (Hill and Birkinshaw, 2008).

Subsequently, we consider the CVCs investment strategies, as target selections will determine their ability to provide value (Gompers and Lerner, 2000). We classify the investment as in strategic fit or strategic unfit. Due to CVCs' massive technical know-how, we believe that the former leads to a higher impact on portfolio firms. Lastly, we analysed the possibility of obtaining an ideal CVC profile concerning the investment strategy and the organisational structure.

We document that CVCs' organisational setting has to resemble the IVCs structure to guarantee a higher impact on portfolio firms. Conversely, CVCs adopting a corporate-like organisational model negatively impacts startups' performances.

Subsequently, we demonstrate how CVCs are still not able to let their strategic objectives coexist with the startup's one. This tension influences portfolio firms' performances negatively. We provide evidence supporting that adopting an exoisomorph structure can only mitigate this issue.

Besides, we confirm that CVCs positively impact startups in a strategic fit; on the other side, they are not tailored to support new ventures with an unfitting strategic scope. These results hold regardless of the organisational structure.

Overall, our findings inform entrepreneurs on the impact that the different CVCs heterogeneity can have on their financial performances. We provide them with a series of elements to control before starting the equity tie with a corporate investor. Besides, we underline how a strategic-organisational fit has to be reached in the CVC domain, urging CVCs and corporate managers to change their practices to serve better both their parent company and their portfolio firms.

Keywords: Venture Capital, Corporate Venture Capital, Organisational Theory, Economic Performance, Growth

Abstract (Italian)

I Corporate Venture Capitalist svolgono un ruolo chiave nel panorama della finanzia imprenditoria. Provvedono a fornire attività a valore aggiunto alle startups in portfolio, ma, non essendo indipendenti sono esposti a diverse problematiche.

La letteratura fornisce diverse evidenze a riguardo l'impatto dei CVC sulle performance delle startup. D'altro canto, questi risultati sono spesso contrastanti. La mancanza di una visione completa sull'argomento potrebbe essere altamente influenzata dall'eterogeneità che caratterizza il mercato dei CVC. Riteniamo che i diversi gruppi di CVC possono fornire diversi tipi di support alle aziende in portfolio. Di conseguenza, avvalendoci della Teoria Organizzativa, ci siamo focalizzati nel capire l'interazione delle diverse variabili di eterogeneità per scoprire l'esistenza di un ideale profilo di corporate venture capital. Abbiamo considerato un campione di 2848 startups pan-europee finanziate da venture capital e 122 CVCs globali.

Esploriamo diverse dimensioni di eterogeneità. La prima riguarda la struttura organizzativa dei fondi di corporate venture. Classifichiamo i CVC in exoisomorph, che adottano un'organizzazione simile a dei IVC, e in endoisomorph, che adottano un'organizzazione simile a quella aziendale (Suoitaris et al., 2012). Crediamo che l'exoisomorphism garantisca un maggiore impatto sulle startup, tenendo conto dell'alta dinamicità dell'ecosistema. La seconda variabile è l'orientamento strategico del CVC, in quanto la relazione tra le parti è basato su un fragile equilibrio competitivo (Katila et al., 2008). Classifichiamo la mission del CVC in strategica, quando punta ad aumentare il valore della parent, finanziaria, quando aspira a ottenere ritorno sull'investimento, e non focalizzata, quando combina sia l'obiettivo strategico e finanziario (Rohm et al., 2017). Considerando i loro ruolo a come partner industriale a valore aggiunto, sosteniamo che i CVC strategici hanno più incentivi a supportare la crescita delle aziende in portfolio. Di conseguenza, investighiamo l'esistenza di un profilo ideale di CVC, cioè un corporate venture fund che ha ottenuto un fit tra la struttura organizzativa e l'obiettivo strategico. Crediamo che questi CVC possano avere un impatto significativo sulle aziende in portfolio (Hill and Birkinshaw, 2008).

Successivamente, consideriamo le strategie di investimento dei CVC, in quanto la selezione del target determinerà la loro abilità di fornire valore (Gompers and Lerner, 2002). Classifichiamo la strategia di investimento come in fit strategico o in unfit strategico. Data la vasta conoscenza tecnica dei CVC, riteniamo che i primi portino a un maggiore impatto sulle aziende in portfolio. Per ultimo, analizziamo la possibilità di ottenere un profilo ideale di CVC riguardante la strategia di investimento e la struttura organizzativa.

Documentiamo come la struttura organizzativa deve assomigliare a quella di un IVC per garantire un maggiore impatto sulle aziende in portfolio. L'adozione di un modello organizzativo che richiamo quello aziendale ha un impatto negativo sulle startup.

Successivamente, argomentiamo come i CVC non siano in grado di far coesistere i loro obiettivi strategici con quelli della startup. La tensione influenza negativamente le performance delle aziende in portfolio. Dimostriamo come l'adozione di una struttura "exoisomorph" può soltanto mitigare questo problema.

In aggiunta, confermiamo che i CVC impattano positivamente le startups quando sono in fit strategico, ma d'altro canto, non sono predisposti a supportare new ventures con un'area strategica in unfit. Questi risultati sono validi indipendentemente dalla struttura organizzativa.

In generale, i nostri risultati informano gli imprenditori sull'impatto che le diverse eterogeneità di CVCs possono avere sulle loro performance finanziarie. Forniamo loro una serie di elementi da controllare prima di iniziare un rapporto di equity con un investitore corporate. In aggiunta, deve sottolineare come un fit strategico-organizzativo ancora essere raggiunto nel settore del CVC, sollecitando i manager delle corporate e dei CVC a cambiare le loro practices per servire meglio sia la azienda madre sia le aziende in portfolio.

Parole Chiave: Venture Capital, Corporate Venture Capital, Teoria Organizzativa, Performance Economiche, Crescita

Executive Summary

Our research aims to investigate the literature about the investment relationship between new ventures and Corporate Venture Capitalists (CVCs). We focused on understanding how the CVCs' heterogeneity may affect their impact on portfolio firms' economic performances.

It represents a relevant topic in entrepreneurship considering that not all the types of investor impact the startups' financial performances in the same way (Hsu, 2006). The choice between receiving funds from either a CVCs or an Independent Venture Capital (IVCs) will completely change new ventures' development dynamics. Entrepreneurs are not blind in their choices and can detect venture investors' key characteristics and pick the one providing more benefits (Bengtsson and Wang, 2010). However, this decision might not be straightforward concerning CVCs. The evidence on their impact on portfolio firms is often contrasting. Indeed, on one side, they are widely recognised for their support in terms of assets complementarity thanks to their extensive resources and know-how (e.g., Chesbrough, 2002; Hellmann, 2002). On the other, they suffer from their captive nature (e.g., Gompers, 2002). CVCs close relationship with the parent company may lead to misalign the dyad's objectives. Indeed, the literature coined the "swimming with sharks dilemma" (e.g., Katila et al., 2008) and the "CVC Paradox" (Dushnitsky and Shaver, 2009) expressions to underline the fragile equilibrium of such a relationship. Scholars suggest that the entrepreneurs should decide if entering or not in such a relationship according to contingent elements.

We believe that these mixed results are due to heterogeneity. As different VCs lead to different results, it is reasonable to assume that the same applies to different CVCs. In the literature, several classifications emerge underlining the high industry fragmentation (e.g., Chesbrough, 2002; Rohm et al., 2017), and we want to deepen the issue by analysing the most crucial element for CVC funds' performances: organisational structure and strategy (Hill and Birkinshaw, 2008). The organisational structure directly determines the operating activities within funds and, currently, in the literature, is missing a quantitative study investigating the

best organisational model to implement. Some authors criticise adopting a corporate-like organisational model and state that CVCs should resemble an IVC (e.g., Gompers, 2002). However, the implementation as-is is not straightforward (Dokko and Gaba, 2012) and entails some risks steering CVCs away from their strategic objectives. Therefore, the trade-off between the strategic and the organisational dimensions is evident, and it is a crucial point to analyse because their coherence is necessary to obtain superior performances (Hill and Birkinshaw, 2008). With our study, we want to tackle this issue.

At first, we carried out an extensive literature review on the topic. In Chapter 1, we started by explaining the importance of entrepreneurship for markets' dynamic efficiency (Schumpeter, 1942; Arrow, 1962). Unfortunately, entrepreneurs often lack the resources to kickstart their project despite their crucial role, and traditional financing institutions cannot provide them due to information asymmetries (Stinchomber, 1965). Therefore, we introduced the VCs - the only player in the financing sectors capable of supporting highly risky new ventures by providing smart money (Amit et al., 1998). We briefly investigated the traditional deal flow of a traditional VC starting from deal origination to the exit event. We conclude the first chapter by providing a taxonomy of the different VC types in the market, explaining their general characteristics and differences.

Once set the stage on the VC world, in Chapter 2, we investigate the corporate venturing domain. We started from this topic to understand where the CVCs activities collocate within the parent's boundaries. More precisely, they originate from corporate entrepreneurship practices and are among the most critical activities for strategic renewal (Keil, 2000). CVCs started being set up in the late '60s and have gone through four different waves, earning the name of "tourist capital". It underlines how the CVCs activities are highly influenced by the parents' cash flow that usually suffers from markets downcycles. The historical excursus prepared us to provide an overarching definition of CVCs, i.e., investment vehicles of incumbent firms entitled to carry out minority investments in new ventures. In other words, they have to provide strategic benefits and adequate financial return to the parent company. CVC investments are characterised by a triadic relationship involving the startup and the unit. The CVCs act as an intermediary between the parties and aim at bringing benefits to both of

them. The parent presence highly influences CVCs' activities, and their deal cycle differs from traditional IVCs (Souitaris and Zerbinati, 2014).

Subsequently, we started to investigate the heterogeneity within the CVCs domain by analysing different classification proposed by the literature. Rohm et al.'s (2017) study is instrumental in our analysis as it classifies CVCs accordingly to their strategic orientation and demonstrates how they support the invested startups differently.

Considering the several classifications proposed, we provide the main variables to consider when approaching a CVCs unit (Dushnitsky, 2011), namely, the organisational structure, autonomy level, goals, and the personnel involved.

We subsequently deep dive into the organisational structure of the CVCs fund. Souitaris et al. (2012) carried out an interesting study on the topic instrumental in our work. They classify the corporate funds as either exoisomorph or endoisomorph. Exoisomorph is a CVC with an organic organisational structure resembling the IVC world. On the other hand, endoisomorph CVCs have a mechanic structure similar to the corporate one. The debate over the best one is still open, and we present some studies supporting both arguments (Gompers and Lerner, 2002; Dushnitsky and Shapira, 2010; Yang, 2012).

In Chapter 3, we analysed the interfirm equity relationships from the corporate side. CVCs are becoming widely recognised as the best conduit for Open Innovation (Chesbrough, 2002). The interaction with startups represents a unique opportunity to tap into new knowledge and cope with disruptive technologies (Christensen, 1997), such as the digital ones (Downes and Nunes, 2016) or AI (Iansiti and Lakhani, 2020). We dedicated a sub-chapter to investigate the interplay between the corporate's goal and CVCs, and we find evidence supporting the greater importance of strategic goals over financial ones. We presented the Ryanto and Schweinbacher (2006) and Fulgheri and Sevilir (2009) models that explain this topic by leveraging econometrics techniques. The authors showed how the determinants to set up a corporate fund is mainly strategic, such as securing demand for its product (Ryanto and Schweinbacher, 2006) or outsource innovation to a more competitive unit and obtain a competitive advantage over competitors (Fulgheri and Sevilir, 2009). We conclude this part of the analysis by providing empirical evidence supporting the CVCs opening's positive effect on corporate performance.

In Chapter 4, we shift the analysis perspective and investigate the equity tie from the entrepreneur side. At first, we provide a taxonomy for startups and new-technology-based firms. We then stress the importance of financial resources and, more precisely, smart money that the entrepreneurs look for in the venture capital industry. It is essential to recall their ability to select the right investors (Bengtsson and Wand, 2010), as it allows to understand why entrepreneurs may decide to enter or not in an equity tie with a corporate venture fund. More precisely, we document how new ventures face a trade-off in accepting CVCs' money. In particular, CVCs can provide differentiating value-adding activities vis-à-vis other VCs, such as access to complementary assets (e.g., Block and MacMillan, 1993), distribution channels (Chesbrough, 2000), technical support (Ivanov and Xie, 2017). Besides, the parent's company is usually an established player in the industry and receiving their funds act as a stamp of approval (e.g., McNally, 1997). On the other side, several drawbacks emerged. CVCs are not structured to provide entrepreneurs with the same support as IVCs due to their close relationship with the corporate. For example, equality issues may prevent the implementation of incentives schemes, decreasing the investment team's quality, but also the misappropriation risks can damage the dyad relationship (Katila et al., 2008). Therefore, the literature has not reached a consensus on the CVCs overall impact on portfolio firms economic performances.

In Chapter 5, we define our hypotheses. At first, we start our analysis by suggesting that heterogeneity is the primary reason for the mixed or incomplete results on CVCs' impact on portfolio firms. CVCs are different, leading to a different impact on the fund's performances (Pache and Santos, 2010; Greenwood et al., 2011; Thornton, Ocasio, and Lounsbury, 2012). We focused our attention on two heterogeneity variables, namely, organisational structure and strategic intent.

We classify CVCs organisational structure in exoisomorph or endoisomorph leveraging on Souitaris et al. (2012). Subsequently, we hinge from Hill and Birkinshaw (2008) that stressed how CVCs should obtain consistency between their organisational profile and strategic objectives. The two are mutually influencing forces. For a given strategy exists a limited number of suitable structures and vice versa (Drazin and Van de Ven, 1985). Therefore, we introduce strategic objectives as our second level of heterogeneity. The literature agrees that CVCs' objectives are usually strategic, even though it is not unusual to find financially focused

or unfocused CVCs (Rohm et al., 2017). Besides, CVCs' strategic goals provide the corporate with the incentives to provide the differentiating value-adding benefits vis-à-vis other VCs (e.g., Chesbrough, 2002).

Once we define our variables, we advanced three hypotheses.

At first, we decide to test the most suitable CVCs' organisational structure to support the portfolio companies. We support what the literature suggested concerning the benefits of the exoisomorph organisational model, and we want to validate its superior impact on startups performance compared to the endoisomorph one (H1).

Our second hypothesis deep-dives into the role played by the strategic intent. We support what suggested by the literature concerning the benefits of the strategic objectives, and we test whether strategic CVCs are able to have a more significant impact on startups performances (H2).

Subsequently, we want to solve the trade-off mentioned above between the ideal CVCs' organisational structure according to their strategic intent. More precisely, we investigate whether CVC strategic goals are better supported by endoisomorph CVCs (H2a) or by exoisomorph CVCs (H2b).

Lastly, we decide to approach the CVCs objectives from a different angle. Evidence suggests that CVCs should invest in startups with a strategic fit, i.e., operating in a related industry and with a complementary strategy. This element aligns the dyad objectives and enhances the corporate impacts on the portfolio firms (Gompers and Lerner, 2000; Gompers, 2002; Hellmann, 2002; Ivanov and Xie, 2010). Therefore, we assume that the investment strategy represents a proxy for CVCs' objectives, and we decide to test it as an alternative hypothesis to H2. More precisely, we want to prove that CVCs can have a higher impact on startups performances when they are in strategic fit (H3).

Considering that evidence suggests that the CVCs' portfolio affects the organisation's effectiveness (Fischer et al., 2019), we, therefore, investigate whether an endoisomorph (H3a) or an exoisomorph (H3b) structure is more suited to support investments in strategic-fit startups.

We test the hypotheses by applying quantitative econometric analysis and complementing with three on-field interviews with venture capital professionals. The database is composed of three sources: VICO, Orbis, and CVCs' website. The panel includes 2848 Pan-European

startups active between 1998 and 2015. The investors' coverage is global and includes 112 CVCs. We start investigating the data with an extensive descriptive statistic in Chapter 6, and then we present the methodology and results of our analysis in Chapter 7 and 8.

We build five econometrics models. For each model, we run three different regression techniques: Ordinary Least Square, Random Effect, and Fixed Effect. We adopt startups' sales as a dependent variable. On the other hand, the main independent variables investigate the CVCs' heterogeneity level.

We start our analysis with Model (1), leading to interesting results. Indeed, it supports the first hypothesis suggesting that the most-suited organisational structure to improve the startups' performances is the exoisomorph one. This structure's benefits are several. It guarantees the top management to adopt VC-like practices, such as high-powered incentives schemes, without incurring internal tensions. Secondly, it provides more autonomy and flexibility to the CVC managers. Thirdly, a more arm's-length approach limit the entrepreneurs' concern over the misappropriation approach.

On the other hand, the adoption of an endoisomorph structure would prevent the adoption of such practices. It will expose the funds to the drawbacks of a mechanic structure ill-suited to cope with a fast-changing environment (Gompers and Lerner, 2000). The results align with the literature, and, besides, they provide for the first time quantitative evidence proving the significant role of the organisational structure in managing corporate venture funds.

We then proceed to test Model (2). Surprisingly, the results reject the second hypothesis, saying that the CVCs' strategic intent should significantly impact startups' performances. Conversely, the analysis provides evidence that strategic CVCs impact portfolio firm's sales negatively. We believe that the main reasons are connected with the tensions that may starts when the objectives are not aligned. Indeed, the swimming with shark dilemma may exacerbate when the corporate deliberately states its strategic incentives. In this case, the relationship will depend on fragile cooperation equilibrium (Santos and Eisenhardt, 2011; Brandenburger and Nalebuff, 2011). If the corporate's competitive side prevails, it can easily tap into new knowledge and misappropriate (Dushnitsky and Shaver, 2009). Consequently, the entrepreneurs will tend to protect themselves with some safeguard, starting a vicious cycle.

We subsequently analyse Model (3) that provides interesting insights. More precisely, it confirmed the negative role played by the endoisomorph organisational structure. The latter impact on portfolio firms' performances does not even change when adopted by a strategic CVC. Indeed, we believe that also considering model (2) results, this combination can be deadly for the relationships because the two elements are negatively self-reinforcing.

On the other side, Model (3) provides mild support to H2b. It proves how adopting an IVC-like model can mitigate the drawbacks related to CVCs' strategic goals. Leveraging on Hill and Birkinshaw (2008) and Fischer et al. (2019), the strategic CVCs limited impact can be the direct consequences of a current misalignment between the fund's goal and organisational model. In other words, we believe that strategic CVCs still have to manage to combine their mission with the suitable organisational model allowing them to exploit their potential.

It is worth underling that this result, combined with H1 one and the on-field interviews, confirm that exoisomorphism will be the norm. CVCs have understood the advantages of this organisational setting and have started adopting it. Luckily, the interviews provide encouraging insights into how CVCs are now integrating this model with their strategic goals. We analyse Model (4) and confirm that CVCs will have a higher impact on portfolio firms' performances when investing in startups with a strategic fit. Our analysis is aligned with the studies done by Gompers and Lerner (2000), Gompers (2002), and Ivanov and Xie (2010). They suggest that the key differentiator for the CVCs' impact on startups' performance is the strategic fit. The latter guarantees the party's objectives alignment and safeguard the relationship. On the other side, we confirm that when the two strategies do not fit, the corporate may lack the competencies to support the firms as they operate in different domains; or if the dyad objective are conflicting, exacerbating the tension in the relationship (Hellmann, 2002).

We deep-dive into Model (5) and discover that both the endoisomorph and the exoisomorph organisational structures do not influence the magnitude of the strategic fit's impact on portfolio firms' performance. We manage to explain this result by leveraging on-field interviews. More precisely, it emerges that CVCs investment in strategic fit is the norm. They are able to support the portfolio firms better and create synergies. However, CVCs carefully evaluate investment opportunities from other business domain, evaluating case by case. We conclude that the investment strategy moves in a completely different path from the organisational structure, and their interaction is not significant.

Finally, in the last chapter of the thesis (Chapter 9) we delineate the limitations and suggest future research directions.

Firstly, one limitation concerns the dataset. The observations of the different CVCs transaction (the ones for which information on strategy and organisational structure of CVC were available) were limited in number. Future studies could replicate our analysis by adopting a more significant amount of data.

Secondly, the measure adopted in the study may have conditioned the results. We gather the information on the CVC's strategic intent from their websites - considered a potential source of information by Porter (1997). However, they may not fully capture the strategic orientation of the observed CVCs. Future studies can adopt as a proxy the fund top management team's prior working experience, which, accordingly to Dokko and Gaba, 2012 directly influence an organisation's strategy. On the other hand, we match the dyad sector to encode the strategic fit measure. This proxy could not capture the level of complementary completely. The previous studies addressing the issue collected the data from annual reports (Gompers and Lerner, 2000; Ivanov and Xie, 2010). However, they analysed a small dataset, and the process is not straightforward to replicate in a vast database as VICO. Future studies can control for an another variable considered crucial in an interfirm equity tie with CVCs: assets complementarity. Park and Steensma (2012) underlined its importance in their analysis as one of the main variables determining incentives in receiving corporate funds. Therefore, we assume that a specific organisational structure can support their provision better. Controlling for this information in the analysis would help to add another information layer on CVCs' heterogeneity. Lastly, as a dependent variable, we rely on sales that capture only a part of an investment's economic impact. Further research can deepen the analysis by adopting an overarching measure such as Overall Economic Performances (Colombo and Murtinu, 2017) or valuation (Ivanov and Xie, 2010).

To conclude, in entrepreneurial finance, unobservable variables are crucial to controlling. We rely on techniques controlling only for time-invariant unobservant. Future research can try to adopt a more advanced technique, such as the General Method of Moment, controlling for time-variant information influencing the analysis.

Are Corporate Venture Capitalists Better at Improving the Portfolio Firms' Performances?
An Analysis of CVCs' Heterogeneity

*"If You Defer Investing Your Time and Energy Until You See
That You Need To, Chances Are It Will Be Too Late."*

Clayton M. Christensen

Introduction

In the last twenty years, practitioners have increasingly considered innovation the main ingredient to sustaining a competitive advantage (The Economist, 1999). Governments have understood its importance and have been trying to support domestic enterprises in their innovation activities. For example, the EU, in the Lisbon Strategy 2002 and 2010, set up different economic incentives (e.g., Horizon Project) to make Europe “the most dynamic and competitive knowledge-based economy in the world”. The momentum for innovation is not a surprise. Indeed, the literature has been stressing its benefits for society since Schumpeter's early works (1912; 1942) and Arrow (1962). Innovation is the engine for dynamic efficiency – a necessary ingredient to improve the nations' wealth. In this scenario, entrepreneurs are one of the critical enablers. However, despite their crucial role, they usually face more significant difficulties in beginning their innovation journey than big firms. Founders typically lack the resources necessary to properly kickstart new ventures (Evans and Jovanovic, 1989) and, simultaneously, have difficulties obtaining these resources from external investors, i.e., capitals from traditional investors.

This market inefficiency is the results of information asymmetries surrounding entrepreneurial ventures. The literature introduced the term “liability of newness” to capture the phenomenon (Stinchcombe, 1965). More precisely, startups have limited access to the capital market as they are new in the market, and therefore they lack a track record, and their business models are surrounded by uncertainty. This makes it challenging to provide a reliable estimation of their value (Carpenter and Petersen, 2002a). Besides, when they have assets, they are usually intangible and firm-specific and are thus challenging to pledge as collateral (Almeida and Campello, 2007; Berger and Udell, 1998; Carpenter and Petersen, 2002a; Denis, 2004).

Capital market imperfections leave many entrepreneurs underfunded (Holtz-Eakin, Joulfaian and Rosen, 1994), negatively influencing their growth and survival (e.g., Carpenter and Petersen, 2002b; Hall, 2002, Denis, 2004; Hajivassiliou and Savignac, 2008). Ultimately, they

can be forced to abandon their projects – even though profitable – for lack of liquidity (Hall, 2002; Stiglitz and Weiss, 1981; Stiglitz, 1985; Bank of England, 2001). This damages not only the entrepreneur herself but the whole economy.

Unfortunately, the entrepreneur-investor information asymmetries are an intrinsic characteristic of entrepreneurial finance (Wright and Robbie 1998) that the traditional financial system is not able to solve, i.e., they lack the competencies necessary to screen and monitor startups (Bertoni et al., 2010; 2015).

For this reason, the role played by alternative financial institutions has been proving fundamental. In this category, VCs are standing out as the entrepreneur's new hero. Thanks to their unique limited partnership structure, VCs can partially overcome the information asymmetries and invest in early-stage valuable firms (Chemmanur et al., 2011).

More precisely, VCs have a fully dedicated team that screens investment opportunities in the market. The most promising ones undergo a due-diligence procedure to reduce as much as possible the adverse selection issue characterising the pre-investment phase. Secondly, to limit moral hazard, they carry out two core activities: monitoring and value-adding. Concerning monitoring, VCs closely control the portfolio firms actions via reporting and board seats. The literature confirmed that closely supervising limits the startups' misbehaviour and increases their performances (Admati and Pfleiderer, 1994; Lerner, 1995b; Mitchell et al., 1997). However, the role of VCs does not limit to pure monitoring. It becomes a coaching figure and provides value-adding services (Colombo and Grilli, 2010). These post-funding activities become real resources for the investee companies (Shepherd et al., 2000) and are fundamental for early-stage (Aspelund et al., 2005; Gerstein and Reisman, 1983) and high-tech (Colombo and Grilli, 2005) new ventures. Indeed, several pieces of evidence demonstrated how VC-backed firms experience higher productivity growth (Chemmanur et al., 2011; Croce et al., 2013) than not-VC-backed firms.

However, VCs are heterogeneous, and they can offer entrepreneurs different sets of complementary services. Therefore, the impact on new ventures performances varies accordingly to the type of VC (Hsu, 2006). As underlined by Bengtsson and Wang (2010), entrepreneurs are aware of this heterogeneity and factor in it, when deciding whom to ask for funds.

VC heterogeneity depends on several dimensions, such as investment targets, evaluation methods, core competencies and capabilities, objectives, and governance. Accordingly, the

literature identifies four main clusters of VCs: i) Independent Venture Capital (IVCs), i.e., professional investment funds; ii) Corporate Venture Capital (CVCs), i.e., investment arms of established companies; iii) Government Venture Capital (GVCs), i.e., investment funds set up by public organisations; iv) Bank Venture Capital (BVCs), i.e., investment arms of private financial institutions.

The thesis focuses on the second clusters, i.e., CVCs. Corporate venture funds are gaining momentum in the last 20 years. A fourth wave has started, and both practitioners and scholars recognise them as a valid alternative to IVCs for the first time in history. Compared to the previous waves, CVCs are becoming more stable and have a well-defined strategy (Dushnitsky, 2011). These results may signal that the new programs are not any more "tourists" and are set to stay (Vidra, 2019).

CVCs' uniqueness depends on their captive nature, i.e., they manage incumbent firms' funds by undertaking direct minority investments in new ventures as a standalone investor or as a limited partner (NVCA, 2001; Gompers and Lerner, 2000). Unlike IVCs, CVCs do not deal with many limited partners but only with one actor: the corporate. They operate as an intermediary between the startups and the parent and aim to benefit both of them. More precisely, concerning the startups, CVCs provide them with complementary assets (Chesbrough, 2002) to overcome their resources constraints (Maula et al., 2005). On the corporate side, CVCs can bring several benefits: improving innovativeness, increasing sales, and saving costs (e.g., Dushnitsky and Lenox, 2005b). These elements underline how the final objectives of CVCs are not only financial but mainly and firstly strategic (Yost and Devlin, 1993; Erns&Young, 2002; Chesbrough, 2002). The balance between the two objectives depends on the corporate's strategic choices about the fund strategy (e.g., Hill et al., 2009) and its structural organisation (e.g., Fischer et al., 2019; Souitaris and Zerbini, 2019).

What makes CVCs stand out vis-à-vis other VCs is the offering of four peculiar value-adding activities. First, corporate funds can provide parents' assets and capabilities, i.e., the so-called complementary assets, to sustain portfolio companies' development (Block and MacMillan, 1993; Teece, 1986; Pisano, 1994). Secondly, new ventures can access parents' Business Units (BUs), favouring the creation of cooperative relationships. Thirdly, startups can learn via observing and benchmarking with the corporation (Yang, 2012) and accessing their domain-specific knowledge. Lastly, receiving money from a corporate fund is considered a stamp of

approval, i.e., an endorsement to these unproven enterprises (McNally, 1997; Stuart et al., 1999; Maula and Murray, 2002).

However, alongside the potential benefits, Corporate Venture Capitalists can involve some risks for the entrepreneurs (e.g., Maula and Murray, 2002). First of all, CVCs' organisational structure, i.e., the Limited Partnership model's absence, raises some concerns about their incentives in supporting the startups. Secondly, CVCs face difficulties in attracting top-class employees for their funds, decreasing the quality of their services (Dushnitsky and Shapira, 2010; Ivanov and Xie, 2010). Thirdly, corporate funds tend to suffer from organisational tensions due to intraorganizational politics (Sykes, 1990). Fourthly, the tie with the parent corporation may prevent startups from developing commercial relationships with other entities (Ivanov and Xie, 2017). Lastly, the most critical element for the startups is the misappropriation risk (Dushnitsky and Shaver, 2009), i.e., the CVCs may share knowledge and information and transfer core technology to the corporate, jeopardising their success (Hamel, 1991).

In other words, CVCs may expose startups to both potential downsides and upsides. In the literature, an agreement on which of the two prevails is still to be reached. Empirical analyses offer mixed and incomplete results.

All studies considered (e.g., Ivanov and Xie 2010; Colombo and Murtinu, 2017) do not factor in a relevant element in the CVC domains: heterogeneity. CVC can widely differ among each other leading to different practices and results for all the parties involved. Gompers and Lerner (2002) were among the first to explain how the differences in CVCs objectives, i.e., strategic vs financial, can influence the funds' impact in increasing exit. On the other hand, Yang (2012) considered the governance structure and its role in shaping the dyadic relationship, analysing the influence on the startups' exit probability and innovation rate.

The interplay between strategic goals and organisational structure leads to heterogeneity (Hill and Birkinshaw, 2008). More precisely, the former two forces influence each other and need to be consistent to guarantee the funds' survival (Di Maggio and Powell, 1983). In other words, for a particular strategy exists a limited number of organisational structures and vice-versa (Drazin and Van de Ven, 1985). These decisions directly influence investment activities (Fisher et al., 2019). Indeed, in one of the three interviews carried out to support this thesis, a CVC manager explained how the deal flow has particular specificities due to their organisational setting and strategic objectives.

On the strategy side, there is ample evidence stressing that strategic CVCs offer value-adding services that other VCs are not able to (e.g., McNelly, 1997; Chesbrough, 2002; Maula et al., 2005; Parker and Steensma, 2012). On the other side, they may generate problems on the organisational side. More precisely, working closely with the parent may urge strategic CVCs to adopt corporate practices (Souitaris et al., 2012). An organisational structure resembling the corporate model, i.e., endoisomorph, has been considered by scholars ill-suited for venture capital investing (e.g., Gompers and Lerner, 2002). On the other hand, several authors suggest the adoption of an IVC-like structure, i.e., exoisomorphic. This second form should guarantee to combine the benefit of the agile organisation typical of the VCs and, at the same time, provide the value-added services of CVCs. However, this is not simple at all. The IVCs model can suffer when applied within a corporate context. For example, a high-powered compensation scheme may generate equality issues (Corporate Venturing Directory & Yearbook, 2001), and investment managers may be too focused on financial returns (Hendry, 2002). Indirectly, the CVC manager interviewed confirmed these problems. Indeed, the fund has strategic objectives, and it configures as a dedicated fund, but it is, however, entirely managed as an IVCs.

To sum up, the trade-off is evident, and there is no evidence suggesting which is the best organisational structure to adopt—the thesis aims at addressing this issue.

At first, the CVCs strategic orientation information was captured by looking at the mission statement on their website – a proxy suggested by Porter (1997). Secondly, thanks to the CVCs juridical form data, it was possible to group them into CVCs adopting the exoisomorph or the endoisomorph structure. Thirdly, a matching procedure of the CVCs' and the startups' industrial sector allowed the mapping of the fit between the CVC-startup dyad.

Subsequently, five regression models were developed. The first one wants to investigate the best organisational structure to support portfolio firms' performances. The second one analysed the impact of CVCs' strategic objectives on portfolio firms' performances. The third model investigated the interplay between the organisational structure and the strategic, in particular whether existed an organisational structure to unleash the benefits of strategic CVCs. The four model aimed at understanding the role of strategic fit in portfolio firms' economic performances. Lastly, the fifth model investigated if a particular organisational structure can better support startups in strategic fit with the corporation.

The results provide interesting results concerning the ideal organisational structure and investment strategy to adopt in CVCs. More specifically, it contributes to the organisational theory literature providing, for the first time, quantitative data supporting the adoption of a specific organisational model. However, not all the hypotheses were confirmed, mainly those concerning the CVC objectives and are left to future research.

The thesis is made of nine chapters.

Chapter 1 provides a quick overview of the importance of fostering innovation via entrepreneurship. It underlines the importance of VCs and provide a general taxonomy of the industry

Chapter 2 is vertically focus on the corporate venture capital domain. It provides a historical overview and then deep-dives into the peculiarities of these venture funds.

Chapter 3 analysed the equity tie formation from the corporate side. It explains the rationale behind opening a corporate venture fund and the implications for the parent corporations. It concludes by presenting empirical evidence on the topic

Chapter 4 shifted the analysis' focus and analyses the equity tie formation from the entrepreneurs' perspective. It first introduces the entrepreneurs' main difficulties in kickstarting their project and how CVCs can help. Both theoretical and empirical evidence are included.

Chapter 5 includes the three hypotheses, carefully explaining the procedures leading to their formulation

Chapter 6 contains the data modelling procedures necessary to build the dataset and the descriptive analysis.

Chapter 7 describes the methodology adopted to carry out the study.

Chapter 8 comments on the results.

Chapter 9 provides the conclusions and wraps up the findings.

Chapter 1

Innovation and Venture Capital

Innovation has become the new industrial religion in the last twenty years, and it is considered the main ingredient to sustain a competitive advantage ever since (The Economist, 1999). Governments and institutions, when intervening in the economy, always strive to stimulate innovation initiatives. For example, the EU, in the Lisbon Strategy (2002) and in 2010, agreed that Europe should become “the most dynamic and competitive knowledge-based economy in the world”. In this endeavour, a few years ago, they set up the Europe Horizon 2020 program with the objectives of getting each country to invest 3% of their GDP in research and innovation by the end of 2020.

However, even though innovation is now getting the headlines, it has a long story. In the first decade of the twentieth century, Schumpeter (1912) was one of the first to theorise innovation in what is now known as Schumpeter Mark I (SMI). He stated that entrepreneurs are the protagonists in the economic landscape as they transform inventions into innovations through entrepreneurial activities. Therefore, public policy should be made to incentivise and protect innovation to guarantee them extra profits. It is worth noting that the final aim of protecting innovation is not solely tied to entrepreneurial profits. The beneficiary of this process is the society as a whole. Promoting entrepreneurial activities to foster innovation is essential to achieve market dynamic efficiency, i.e., the improvement and generation over time of new production methods or products. Schumpeter labelled this process as creative destruction, i.e., the competitive mechanism happening through innovation that results in a high dynamic efficiency level. However, he soon realised that innovation sometimes is burdensome for lone entrepreneurs, and its activities require a lot of capital to generate significant progress. He theorised these new thoughts in the Schumpeter Mark II (SMII) (1942),

where he stated that innovation should be an oligopoly domain. The few involved firms benefit from the economies of scale in R&D, on one side, and, on the other, thanks to competition dynamics, still have the incentives to innovate.

The two contrasting works remained unreconciled until the work of Arrow (1962). For the author, SMI and SMII are not dichotomous, but they describe two different types of innovations requiring different capabilities and involving different incentives. In SMI, Arrow argued that Schumpeter's innovation is radical and demands brokering new concepts and opening new market spaces. It relies on an unencumbered development that only an entrepreneur can provide. Conversely, in the SMII, the innovation involved is an incremental one consisting of minor adjustments to the existing product. Therefore, the efficient deployment of R&D capabilities from an established firm represents the most effective solution. The relationship between innovation and market concentration is inversely U-shaped, underlining both small and big firms' importance in supporting a country's innovation processes.

The main messages from these early studies are two. Firstly, innovation should be fostered as it benefits society as a whole. The impact of dynamic efficiency is necessary to improve the nations' wealth. Secondly, entrepreneurs who play a key part in stimulating dynamic efficiency may face more significant difficulties than big firms in gathering essential resources to innovate. As a weaker party, they need to receive the right help to begin their journey.

1.1 Innovation and Entrepreneurs' Constraints

The entrepreneur is expected to initiate the innovation cycle, but she faces many difficulties in innovating. New ventures in order to properly kickstart require a considerable amount of resources that the founder is usually not able to provide (Evans and Jovanovic, 1989). The financial constraint of newly born firms depends on their intrinsic characteristics that increase the information asymmetries with potential investors (e.g., Amit et al., 1998). More precisely, they suffer from the so-called "liability of newness" (Stinchombe, 1965). New ventures lack a track record that provides reliable information on their value (Carpenter and Petersen, 2002a) and market. Besides, their products are surrounded by uncertainty and, many of them, possess a considerable component of intangible or firm-specific assets that are difficult to

pledge as collaterals (Almeida and Campello, 2007; Berger and Udell, 1998; Carpenter and Petersen, 2002a; Denis, 2004). These characteristics increase the investors' information asymmetries in the pre-investment phase (Arkelof, 1978), which prevent them from funding potentially profitable projects (e.g., Hall, 2002; Stiglitz and Weiss, 1981). Lastly, the asymmetry problems persist in the post-investment phase as the investors-founder relationship is characterised by moral hazard. The agent (the entrepreneur) may decide to pursue riskier projects compared to those they had previously stated, put in lower efforts than the optimal level or favour personal interests rather than the company's ones (Jensen and Meckling, 1976). Classic financial institutions, i.e., banks, lack either the resources or the competencies to screen and monitor the ventures to cope with all these information asymmetries (Bertoni et al., 2010; 2015 b); thus, for potentially profitable projects, the risk of not being financed is high. From a social surplus point of view, this is worrying considering the impact of entrepreneurial ventures on the markets' dynamic efficiency (Audretsch, 1995). Luckily, a new category of investor has emerged: Venture Capitalist.

1.2 Venture Capitalists

Venture Capitalists are funds of funds, usually organised in a Limited Partnership structure: the General Partners, i.e., the VC firms, are in charge of managing the entire investment value chain starting by raising funds from limited partners such as pension funds, high net-worth individual and insurance funds in a pool called venture capital fund, but also placing investments in different startups with a high-risk high-return profile, and ending with repaying the Limited Partners after seven to ten years. The VC firms are usually rewarded with the 2-20 rules, i.e., 2% of annual fee on the money invested and 20% fee on the fund's final profit. Limited partners are not involved in the management of the funds to maintain limited liability. It is up to the VC to carry out equity investments in entrepreneurial ventures (Sahlman, 1990). Due to the limited period, each VC manages multiple funds that are usually specialised for a specific industry or stage of development (Norton and Tenenbaum, 1993). As an industry, venture capitalists cover the whole breadth of a startup's financing stages, even though geographical differences may arise (Bertoni et al., 2015a).

VCS play a vital role in the industry as they are able to reduce the information asymmetries between the market and the entrepreneurial ventures (Chan, 1983; Amit et, 1998). They are

considered informed investors thanks to their vertical focus on high-risk, high-potential return ventures carefully analysed during the screening phase. More precisely, they are able to place bets on startups thanks to three elements:

- i) Fund's structure
- ii) Compensation schemes
- iii) Objectives pursued.

These elements permit them to differentiate the investment to minimise the risk and guarantee a satisfying return on investment (Bottazzi et al., 2008; Tykvova, 2006).

Secondly, they have to monitor the startups' performances via different mechanisms: staged financing, which acts as an option to abandon mitigating moral hazard problems (Sahlman, 1990), and the direct involvement in the startups' operations via board seats or IVC-appointed C-levels (e.g., De Clercq et al., 2006; Gompers, 1995). Besides, VCs are highly interested in contributing to their portfolio firms' growth, and for this reason, their support does not end with the provision of equity financing. VCs provide value-added services such as mentoring, consulting, and networking. They also require frequent reporting in order to maintain control. The final aim of a VC is to lead the startups to an exit, preferably an IPO or trade sales. Evidence points out that they are able to increase the likelihood of the startups' success thanks to their services (e.g., Hellmann, 1998; Casamatta, 2003; Schmidt, 2003; Ueda, 2004; Chemmanur et al., 2011)

1.2.1 The Role of VCs: The Highlight on Thin VC Markets

Croce et al. (2013) and Bertoni et al. (2016) investigated the consequences of an underdeveloped venture capital industry, highlighting the VCs' role in the market.

Ideally, VCs, thanks to their intrinsic capabilities, should pick the most promising ventures in the market, i.e., provide funding to valuable and profitable initiatives that will benefit the whole economy. However, when the VC industry is immature, this not always happens. Evidence shows that, in this case, VCs provide funds to ventures desperately in need of financing while surprisingly not investing in the most productive and fast-growing companies. It happens for two reasons. Firstly, small and resource-constrained suffer severely from adverse selection issues because they do not have the resources and expertise to cope with the market's high information asymmetries. Secondly, thin VC markets imply higher

competition for obtaining funds, and lower quality entrepreneurs are willing to give up a greater percentage of future profits than their peers. Consequently, profitable new ventures may decide to self-select themselves out, as, for them, costs outweigh the benefits. VCs may remain with unallocated funds in extreme situations due to a shortage of valuable investing opportunities (Mason and Harrison, 2001; Carpentier and Suret, 2006).

On the other hand, in mature VC markets, evidence supports the argument that VCs are able to shrink the information asymmetries and invest in valuable firms (Chemmanur et al., 2011). Therefore, it is necessary to provide VCs with the right environment to preserve and foster the country's innovation rate.

1.2.2 The Role of VCs: Monitoring and Value-Added

The main distinctive activities of venture capital funds are two, namely, monitoring and value-adding, and are among the essential pillars of their business model.

Concerning monitoring, the literature confirmed that closely supervising the startups after the investment period (Admati and Pfleiderer, 1994; Lerner, 1995b) is crucial for managers to:

- i) Detect potential problems in the investee firms (Mitchell et al., 1997)
- ii) Reduce agency costs between the parties
- iii) Increase portfolio firms performances.

However, VCs' role goes beyond pure monitoring and is more of a coaching function by providing value-adding services (Colombo and Grilli, 2010). During the investment period, the VCs support the startups in the definition of the strategic and operational planning, in the recruitment process of top management, and the development of the network of contacts all over the value chain (Gompers and Lerner, 1998b; Gorman and Sahlman, 1989; Sahlman, 1990; Sapienza et al., 1996; Sørensen, 2007). All of these activities become real resources for the investee companies (Shepherd et al., 2000) and are especially fundamental for early-stage (Aspelund et al., 2005; Gerstein and Reisman, 1983) and high-tech ones (Colombo and Grilli, 2005). Therefore, the VCs involvement actively increases the portfolio firms' resource bundles (Barney, 1991) both in terms of financial resources (Hellmann and Puri, 2002) as well as strategic resources (Sorensen, 2007).

Croce et al. (2013) provide empirical evidence supporting the assumptions above, showing how VC-backed startups experience higher productivity growth than non-VC-backed.

Similarly, Chemmanur et al. (2011) found that investee firms experience greater total factor productivity after the VCs investment than non-VC-backed firms.

1.2.3 The Role of VCs: Timing and Imprinting

It is reasonable to argue that VCs' positive effect can take time to materialise and it is strictly dependent on the VCs presence to last over time.

Concerning the impact's timing, the most sensitive years for startups to experience performance variation are the first three after the foundation year (Milanov and Fernhaber, 2009). One assumption could be that if the VC investment is not obtained before this period, the startup is not going to benefit from it entirely. Luckily, evidence showed a fascinating insight: VCs investments can be considered a sort of rebirth of the firms. It provides new resources and helps the entrepreneurs define new strategic decisions, opening up a huge performance increase in the years following the deal origination regardless of the startups' age (Bertoni et al., 2011).

The evidence provided by Croce et al. (2013) highlighted how VC-backed firms experience a boost in productivity in the first two years after the VC round compared to their peers. Chemmanur et al. (2011) found the same results with a performance increase in the VC-backed total factor productivity greater than for the non-VCs-backed.

Regarding VCs' lasting effect, early decisions and conditions are a function of the resources available and potentially obtainable at the founding time (Dollinger, 1995) and may imprint the firm's future evolution (Bamford et al., 1999; Boeker, 1989). VCs investment's "rebirth" effect impacts the ways startups organise processes. Over time, these new processes will become routines and will continue to be active and effective even after the VCs departure (Barringer et al., 2005; Boeker, 1988, 1989; Heirman and Clarysse, 2005; Packalen, 2007; Stinchcombe, 1965). Evidence from the study of Croce et al. (2013) supports the hypothesis of a long-lasting imprinting effect by the VCs investment; indeed, VC-backed firms' higher productivity growth does not decrease after the VCs exit.

1.3 The VC Investment Cycle

Entrepreneurs willing to obtain VC funding need to undergo the so-called venture capital investment cycle, a series of steps that have specific characteristics influencing the investor's financial and social relationship. The phases are three: pre-investment, post-investment, and exit phase (Tyebjee and Bruno, 1984).

1.3.1 Pre-Investment Phase

The pre-investment phase encompasses all the screening procedures. In this phase, the VC is looking for promising ventures to invest in, guaranteeing a significant likelihood of obtaining a capital gain via exit (Sahlman, 1990). Therefore, the entrepreneur has to present a well-developed financial, strategic, operations, and marketing plan highlighting the market opportunity, its uniqueness, and the plan to protect the idea; in other words, what the VC would consider a valuable opportunity (Shane, 2003). Lastly, introducing the founders' team background in terms of either entrepreneurial experience or management experience in the industry is crucial.

The pre-investment phase divides into four main steps leading to the deal signature:

- i) Deal origination: entrepreneurs and VCs get in touch for the first time. Usually, VCs' preferred path is referrals from other industry peers and outsiders such as bankers, lawyers, accountants, or consultants (Shane and Cable, 2002). Referral increases their confidence in the trustworthiness of the prospect entrepreneurs
- ii) Deal screening: the VCs evaluate if the new ventures meet the requested parameters in terms of sectors, investment stage, location, and capital needed (Shepherd, 1999b; Zacharakis and Meyer, 2000). Finally, the VC may request a meeting with the entrepreneur or a pitch to quickly evaluate the investment potential. This phase is necessary to eliminate uninteresting prospects and thus properly evaluate the worthwhile ones
- iii) Deal evaluation or due diligence: VCs deep dive in evaluating the venture asking for a variety of information and double-checking what they received
- iv) Deal structuring phase: the parties negotiate the valuation of the venture and equity securities price. The valuation method adopted changes accordingly to the stage of the venture. In addition, several elements are decided during the bargaining phase and are all summarised into the so-called term sheet, such as

liquidation rights or covenants. The entrepreneurs should choose carefully the amount of funds to ask for as the higher the amount, the higher will be the portion of shares to give up and the higher will be the milestones set up by the VCs (De Clercq, 2006).

1.3.2 Post-Investment Phase

In the post-investment phase, the entrepreneurs should expect the VCs to carry out mainly two activities: monitoring and providing value-adding services.

Concerning monitoring, VCs have to reduce any possible agency issue characterising the dyad investor-entrepreneurs (Sapienza and Gupta, 1994). VCs decide to undertake this effort for several reasons. First, the investment is illiquid and therefore, it is impossible to resell the investment immediately (Sahlman, 1990). Second, the venture is usually surrounded by uncertainty and requires more monitoring activities (Sapienza and Gupta, 1994). Thirdly, VCs have to pay their investors to raise funds again (Sahlman, 1990). Finally, the VCs profit is directly linked to the funds' performances (Gifford, 1997). The levers adopted to monitor are staged investments (i.e., funds are provided only after achieving specific milestones), board representations, and regular reporting.

Concerning the value-added activities, they bring value to the investee firms (Busenitz et al., 2004; Dimov and Shepherd, 2005; Edelman, 2002; Sapienza, 1992) and compensate the costs of VC financing. The value-added activities that the entrepreneurs should expect are six (De Clercq et al. et al., 2006):

- i) Strategic role: the VC acts as a sounding board providing valuable suggestions on key decisions for the ventures' future (Sapienza, 1989) regarding strategic, organisational and marketing issues (Pratch, 2005)
- ii) Financing role: the VC opens the gates to other investors such as other VCs or banks (Lerner, 1994). In addition, the VC helps to develop internal financial management procedures (Pratch, 2005)
- iii) Networking role: the VC has a huge network full of professionals with expertise in dealing with startups' needs. Therefore, it acts as a broker between the entrepreneurs and possible service providers, customers, or funders (Pratch, 2005)

- iv) Interpersonal role: the VC plays the sparring partner role supporting entrepreneurs as a friend. For some particular issues, the entrepreneur could be more comfortable confronting the VC rather than sharing doubts or fears with the firms' top management. In other words, it provides moral support to go through a time of crisis (Pratch, 2005)
- v) Reputational role: receiving funds from a VC with a successful track record directly enhances the startups' reputation. It implies attracting financing and customers easily, but also facilitating the recruitment of the top management (Pratch, 2005)
- vi) Disciplining role: VC evaluates and reserves the right to replace the management if they do not meet the milestones. The VC focus is the venture, not the management team; therefore, it may replace the CEO if she is not delivering the required performances. The VC urges the entrepreneurs to focus on attaining agreed objectives: a crucial ability to achieve success (Pratch, 2005; Sapienza, 1989).

1.3.3 Exit Phase

The VC want to clearly define the strategy enabling them to convert the illiquid investment into cash or publicly traded stock. The exit event is usually pre-determined and can occur by four paths:

- i) Initial Public Offering (IPO). VCs preferred path as they can extract a higher valuation for the firm. Entrepreneurs tend to favour IPO as well. IPO allows to raise equity capital without giving up any ownership right: the funders trade a single and powerful shareholder for a fragmented and powerless one - the public market (Black and Gibson, 1998). The negative side of the IPOs is the increase in future regulatory obligation and limited current liquidity for the firm
- ii) Trade sale. It is usually the most common route (Relander et al., 1994) and involves selling the startups to another company. It results in lower value and immediate liquidity but implies that the entrepreneur loses all the control over the company
- iii) Buyback. It is similar to trade sales but in this case, solely the VCs exit while the entrepreneur remains by repurchasing the shares. Therefore, the control of the

entrepreneurs over the company increases as it eliminates the VCs from the cap table

- iv) Liquidation. It is the least desired route for both parties as it involves selling off the venture's assets for their salvage value. The first to be repaid are security holders according to the seniority of their debt, and only after them the holders of equity instruments. Usually, VCs lost some original investments, while the entrepreneurs rarely get money back (D'Aveni, 2005; Cumming and MacIntosh, 2003).

<i>INVESTMENT STAGES</i>	<i>ENTREPRENEUR</i>	<i>VENTURE CAPITAL</i>
PRE-INVESTMENT PHASE		
<i>Deal Origination</i>	i) Identifying potential VCs & investor requirements ii) Checking referrals iii) Contact VC	Checking Referrals
<i>Deal Screening</i>	Pitching & VC investment committee meeting	i) Contact Entrepreneur ii) Deal Screening iii) Pitching & VC investment Committee
<i>Deal Evaluation</i>	Due Diligence	
<i>Deal Structuring</i>	i) Term sheet negotiation and agreement ii) Shareholder agreement negotiations and agreement	
POST-INVESTMENT PHASE		
<i>Monitoring</i>	Operating the Business	i) staged investment ii) reporting requirements iii) board seats
<i>Value-Adding Roles</i>		i) Strategic Role ii) Financing Role iii) Networking Role iv) Interpersonal Role v) Reputational Role vi) Disciplining Role
EXIT PHASE		
<i>Exit Planning</i>	Definition of the best exit route	
<i>Exit Mode</i>	i) IPO ii) Trade-sales iii) Buyback iv) Liquidation	

Tab n.1 - Adaptation from De Clercq (2006) – VC investment Cycle

1.4 Heterogeneity in the VCs Market

VCs are not all the same and diverge along several dimensions: investment targets, evaluation methods, core competencies and capabilities, objectives, and governance. Four are the main clusters that, according to the literature, populate the VCs market i) Independent Venture Capital, i.e., professional investment funds; ii) Corporate Venture Capital, i.e., investment arms of established companies; iii) Government Venture Capital, i.e., investment funds set up by public organisations; iv) Bank Venture Capital, i.e., investment arms of private financial institutions.

1.4.1 Independent Venture Capital

IVCs are private equity experts that focus their investment on young firms with high growth potential. They invest on behalf of institutional investors and lead the entrepreneurs to exit in order to obtain positive returns (Hellman and Puri, 2000). An autocratic style characterises IVCs as they tend to influence the ventures decision by providing advice. IVCs are business professionals whose actions orient more toward commercial innovation than technical innovation (Katila and Chen, 2008). They prefer to solve product problems rather than technical ones due to their knowledge. Their tendency to set up a formal product development process that suits their attitude (Hochberg, Ljungqvist, and Lu, 2007) and their effort in professionalising management confirm what previously suggested. Lastly, IVCs operate under pressure to deliver results in a maximum of ten years. Therefore, they emphasise rhythm and schedule with milestones. IVCs' investment pattern is highly dependent on industry maturity. For example, US IVCs tend to invest in young and local firms (Bertoni et al., 2015). In Europe – a less mature market – IVCs prefer larger and older firms and not necessarily located nearby (Bertoni et al., 2015a).

1.4.2 Corporate Venture Capital

CVCs are investing arms of corporations and tend to seek their parent's strategic advantage through investment in new ventures by providing a window on new technologies, products,

and business models (Katila et al., 2008). Financial returns should be adequate but are less critical (Hallen et al., 2014). They are patient capital and have no hurry to realise capital gains. The corporate presence guarantees a considerable amount of resources, i.e., the so-called complementary assets, which allow startups to develop the technology better (Maula et al., 2005; Makela and Maula, 2008). On the other hand, the corporate hierarchical structure affects CVCs, making them slow and without a precise authority. CVCs are usually composed of corporate employees reporting to the chief technology officers. Most of them have a technical background and, for this reason, CVCs see themselves as a scout and enabler of new technologies (Wadhwa and Kotha, 2006; Hallen et al., 2014). In addition, CVCs have to deal with the entrepreneurs' fear of misappropriation that may increase the agency issues between the dyad (e.g., Katila et al., 2008). Crucial in determining the cost-benefits of the relationship will be the concept of both strategic and technological fit. Strategic fit means that the two parties' strategic objectives are not exclusive but complementary, and therefore, it decreases the incentives to misappropriate. The technological fit implies that the dyad's core technologies belong to the same family. It justifies the CVC funding as it can provide unique knowledge in the domain. The propensity to invest in industries with weak protection and high turbulence confirms CVCs' desire to have a window on new technology (Malerba, 2004; Montobbio, 2004; Dushnitsky and Lenox, 2005a). They tend to prefer new ventures geographically distant to approach a new market (Gupta and Sapienza, 1992; Mayer et al., 2005). The preferred target is more complex to define as it is influenced by geographical and industry-specific conditions (Bertoni et al., 2015a).

1.4.3 Government Venture Capital

GVCs are public-sector funds with mandates on behalf of citizens to invest in promising ventures. They usually look forward to supporting the development of valuable products for the community as a whole. GVCs act as a steward of public funds and tend to have well-documented procedures to ensure treatment equality. It usually compromises the speed and flexibility necessary to compete in the startup world. Usually, these agencies are not able to provide the required monitoring activities - as it could be too costly - as well as encourage innovation discovery without constraints (Marion, Dunlap, and Friar, 2012).

They tend to invest in firms that otherwise would not be funded by other private investors (Lerner, 1999; Lerner, 2002) and their main targets are young and small high-tech companies, operating in complex industries where the time-to-market is usually long (Bertoni et al., 2015a)

1.4.4 Bank Venture Capital

BVCs are investment arms of commercial banks. They are strategic investors and therefore pursue strategic objectives additionally or even in substitution to financial goals. They hope to find complementarities between their core activities and the VC investments (Hellman et al., 2008). More precisely, they hope to create a relationship with future customers for lending and underwriting activities. As they possess specific competencies neither in the business nor in the technological sector, BVCs are usually less capable of carrying out monitoring activities and tend to avoid risky projects (e.g., Bottazzi, Da Rin, and Hellman, 2008; Bertoni et al., 2015a). Therefore, they prefer not to select newly created firms but older and larger ones (Bertoni et al., 2015a). They do not have preferences in terms of the industry but would rather choose local companies over distant ones (Bertoni et al., 2015a).

1.4.5 Corporate and Independent Venture Capital

The differences between the traditional VCs and CVCs have implications on the targeted ventures selected. CVCs are more willing to invest in risky projects with a high technological intensity as they are not entirely focused on the sole financial returns (Fulghieri and Sevilir, 2009; Chemmanur and Loutskina, 2008). Evidence confirmed this by demonstrating that CVC-backed startups are usually more innovative than IVC-backed ones signalling a propensity toward risk (Aghion and Tirole, 1994; Fulghieri and Sevilir, 2009; Pahnke et al., 2015). However, the targeted investment stage may vary according to the venture capital national market's maturity (e.g., Bertoni et al., 2015a). When the IVCs market is mature, CVCs tend to focus on later-stage high-tech projects; conversely, in the hypothesis of thin IVCs market, CVCs step in and invest in early-stage projects to cover the space left by their independent counterpart (Katila et al., 2008; Bertoni et al., 2015a).

The quest for strategic objectives also impacts on the monitoring activities of the VCs funds. IVCs work to increase the likelihood of new ventures exit. Considering that sales are an indicator of business success and thus can increase the exit probability (Bayar and Chemmanur, 2011), IVCs' treatment effect on sales growth is higher than CVCs' one (Bertoni et al., 2013). On the other side, CVCs are more focused on nurturing the technological side of the new ventures. They are able to help them develop their product better than IVCs (Maula and Murray, 2001) thanks to the higher technical competencies and tolerance (Manso, 2011; Tian and Wang, 2013). Indeed, evidence shows how the CVCs investments tend to increase the investee firms' innovation rate rather than sales, and it is especially true when there is a technological fit between the parties (Chemmanur et al., 2014). However, the literature does not miss contrasting views on this topic, with scholars questioning CVCs' potential role as innovation conduits (e.g., Pahnke et al., 2015). Lastly, thanks to the parent companies' reputations in the industry, CVCs act as a stamp of approval certifying the new ventures' quality (e.g., Chersbrough, 2002). The endorsement effect has a significant impact on the entrepreneurs: CVCs have proved to be more capable than IVCs in attracting new customers and suppliers and helping them to gain reputation and publicity (Maula and Murray, 2001). However, the debate on whether the CVC has a significant impact on portfolio firms is still open. Chemmanur and Loutskina (2008) showed how CVC-backed firms have a higher likelihood of reaching a successful exit rather than IVC-backed. Gompers and Lerner (2000) found that CVCs' score is at least as good as IVCs' one solely when there is a strategic fit between the parties, i.e., they have complementary strategic objectives. Differently, Colombo and Murtinu (2017) found that the impact on Overall Economic Performances (OEP) of both IVC and CVC is almost the same, but the dynamics and the timing of the impact change.

Are Corporate Venture Capitalists Better at Improving the Portfolio Firms' Performances?
An Analysis of CVCs' Heterogeneity

	<i>INDEPENDENT VENTURE CAPITAL</i>	<i>CORPORATE VENTURE CAPITAL</i>
<i>Definition</i>	An investor dedicated to undertaking equity investment in entrepreneurial ventures	An established firm undertaking minority equity investment in entrepreneurial ventures
<i>Investor Description</i>	A dedicated financial investor	A corporation with one or more of one business. CVC is responsible for investment activities
<i>Scope</i>	Investment activities are the sole business.	Investment activities are not the core business of investing firms.
<i>Structure</i>	Limited liability partnership (LLP). General partners (GP) raise funds from limited partners (LP) and then invest the capital in entrepreneurial ventures	Various legal and organisational structures. The sole source of capital is the parent corporation which also provides complementary assets
<i>Assets and Resources</i>	Professional investment team and financial capital committed by the LPs	Professional investment team, capital provided by the corporation, access to corporate's complementary assets such as R&D, manufacturing facilities, and legal and sales forces
<i>Investment Criteria</i>	Growth prospects considering the market Management team expertise	Growth and mentoring prospects considering especially the technology
<i>Involvement Level</i> <i>Method</i>	Moderate with usually board membership	Low to extremely high. It can be informal.

Tab. n2 - IVCs vs CVCs

1.4.6 Government Venture Capital and Independent Venture Capital

Scholars have always questioned the government's decision to support entrepreneurial ventures via GVCs by claiming a lack of necessary skills or the resources to carry out investment funds effectively. Grilli and Murtinu (2014) advocate for indirect support by promoting a more favourable environment for venture capital rather than a hands-on approach. Their evidence showed how EU GVCs do not have a significant impact both in terms of sales and employees' growth in the high-tech sectors. Pahnke et al. (2015) found similar results by measuring the impact of government-backed firms' innovation performances. GVCs proved to provide positive results only when they are a part of syndicated funds where they are not the leading investors. In this case, evidence showed that they could increase the exit likelihood (Cumming et al., 2016) and improve sales and employees growth (Grilli and Murtinu, 2014).

1.4.7 Bank Venture Capital and Independent Venture Capital

The empirics documents BVCs final aim of potentially financing future customers for their bank's activities. In the screening phase, BVCs tend to pay greater attention to the prospects' financial position, and, as a result, BVC-backed firms are those with a lower risk of financial distress compared to their peers. In the monitoring phase, the close relationship between the parties allows the parent (i.e. the bank) to gain more information about the startups' creditworthiness and thus favour the latter's borrowing money at a lower interest rate (Elyasiani and Goldberg, 2004). Besides, VC investments have proven to certify the invested firms' quality (Megginson and Weiss, 1991; Gompers and Lerner, 1999; Lee and Wahal, 2004; Buzzacchi et al., 2013) and, therefore, BVC investments can ease access to additional financial debt, operational debt, or equity (Bertoni et al., 2012a, b). As a consequence, the debt exposure of BVC-backed has a more significant increase after the investment round than the non-BVC backed.

Chapter 2

Corporate Venturing

Entrepreneurial activities within the corporate environment have been an element of interest for many scholars since the 80' (Burglermann, 1983; Miller, 1983; Sharma and Chrisman, 1999), with several empirical evidence demonstrating how it is crucial for the survival and renewal of incumbents firms (e.g., Guth and Ginsberg, 1990; Stopford and Badenfuller, 1994). Corporate entrepreneurship involves creating innovative proposals or new organisations by an individual or a group of individuals within the organisation. It divides into three main macro-categories (Keil, 2000; Sharma and Chrisman, 1999). At the centre, there is "Innovation". Innovation is a necessary condition for entrepreneurship to happen. It includes the creation of a new proposal that meets existing or untapped needs in the market (Sharma and Chrisman, 1999). Innovation within the corporate context can lead to the remaining two categories:

- i) Strategic renewal, i.e., corporate's entrepreneurial efforts to significantly change the business strategy or structure. These changes modify the existing relationships within and outside the corporation. When the renewal activities happen within the organisation's boundaries, they are not considered as new businesses (Sharma and Chrisman, 1999)
- ii) Corporate venturing (hereafter CV) includes the set of practices and processes involved in exploring and exploiting new market spaces and industry by starting new businesses via new organisational units outside the corporate's organisation (Narayanan et al., 2009).

2.1 Corporate Venturing

CVs initiatives within a corporation are diverse and can be classified according to two variables: locus of opportunity and strategic logic.

Concerning the locus of opportunity, CV's activities split into internal and external venturing (Keil, 2000; Sharma and Chrisman, 1999). Internal venturing activities directly involve the creation of new businesses within the corporate's organisational boundaries, while external venturing relates to the external modes to tap into new business opportunities such as cross-organisational agreement through semi-autonomous or autonomous entities (Keil, 2000; Narayanan et al., 2009; Sharma and Chrisman, 1999). External corporate venturing includes venturing alliances (Joint Ventures and Non-equity Alliances), Corporate Venture Capital (CVC), and Transformation Arrangements (Acquisition and Spin-offs) (Keil, 2000; Sharma and Chrisman, 1999).

Regarding the strategic logic (Hill and Birkinshaw, 2008), CV's activities divide according to the degree of exploitation versus exploration of new business opportunities (March, 1991). Exploitative innovation means finding new paths to improve production, efficiency, implementation, and execution. It relies on refinement and extensions of existing paradigms, technologies, and competencies (March, 1991). Explorative innovation relates to innovating by taking risks, experimenting, playing, discovering. It is based on the experimentation of new alternatives (March, 1991).

Thus, adopting the two variables, it is possible to classify CVs activities into four categories:

- i) Internal Explorer (internal and explorative), probably, the most well-known activity comparable to the Internal Venturing model of Sykes (1986) and Miles and Covin (2002): the corporate invests in new unexplored opportunities emerging inside itself to nurture them and turn them, over time, into a source of growth
- ii) Internal Exploiters (internal and exploitative), quite a new configuration in the early 2000 (Chesbrough, 2002) identified by Campbell et al. 2003 as venture harvesting units. These units focus on generating liquidity by harvesting unused resources (Campbell et al., 2003); more specifically, they attempt to monetise existing assets such as patents, technologies, managerial talents, and ideas by spinning them out (Hill and Birkinshaw, 2008)

- iii) External Explorer (external and explorative) consists of investments outside the organisational boundaries in small firms and entrepreneurs. The corporate carries out these activities as an independent entity or with other partners. The corporate searches for high growth potential ideas that can be strategically important to them (Hill and Birkinshaw, 2008). The main idea behind lies in the concept of "strategic": the company obtain the right to increase its stake in the external entity but not the obligation, leaving space for high upsides and limited downsides. The investments could be seen as a window on new technologies (e.g., Dushnitsky and Lenox, 2006; Benson and Ziedonis, 2009)
- iv) External Exploiters (external and exploitative) are units investing in external firms with the sole purpose of generating financial return; indeed, the main activities consist of buying and selling equity rather than providing value-adding services to the external entities.

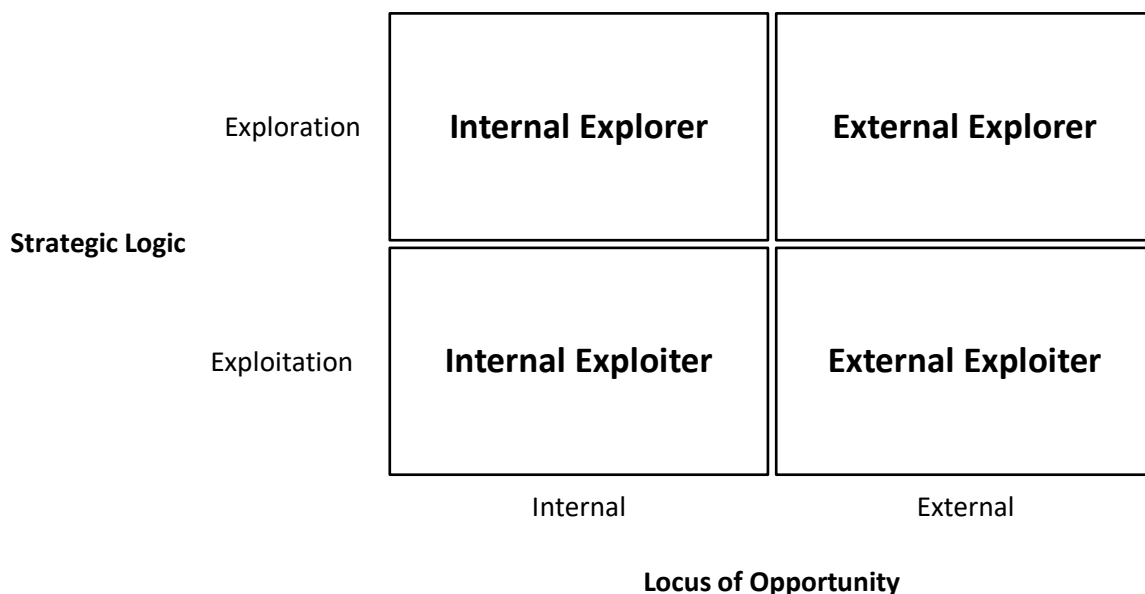


Fig. n.1 – Hill and Birkinshaw (2008), Corporate Venturing Classification

2.1.2 Corporate Venturing Configuration

Referring to the configuration theory (Mintzberg, 1979; 1983; Miller, 1996), the effectiveness and the performance level of a given organisational unit will depend on a fit among the organisational profile and the strategic objectives (Doty et al., 1993). It implies that the corporate - before starting the endeavour in any CV activities - should first analyse the

program's strategic objectives in terms of locus of opportunity and degree of explor-/exploitation. Only after that it should define the CV organisational profile to guarantee internal consistency.

The following elements should align to obtain internal consistency:

- i) Network relationships with the key stakeholders. The key stakeholders are VCs providing access to deal flow (Sykes, 1990), corporate executives in the parent firm to spread the CV culture and obtain resources (Siegel et al., 1998), the CV unit as an autonomous entity (Chesbrough, 2000, 2002; Sykes, 1990), and partners, if any, in syndicated investment (Chesbrough, 2000, 2002; Sahlman, 1990)
- ii) Activities of the venture units, i.e., the unit's involvement in developmental and managerial tasks. The key activities include the selection of the investment target, divestment decisions, and enterprise building and nurturing (Chesbrough, 2000, 2002; Sahlman, 1990; Zider, 1998)
- iii) The CV units' management system adopted to undertake the above-mentioned tasks (Block and Millan, 1993; Rice et al., 2000). The evaluation methods and the incentives provided to CV units managers are fundamental.

Striving for internal consistency is even more important as strategic logic and locus of opportunities are not uncorrelated variables: selecting a strategic objective will directly influence the organisational structure (Hill and Birkinshaw, 2008). Thus, the achievement of organisational consistency, i.e., a proper structure to support the pre-defined objectives, has led to higher corporate venturing activities (Hill and Birkinshaw, 2008). The fit guarantees the generation of synergies in the day-to-day working tasks (i.e., clear directions and better coordination) that will positively impact on the outcomes. Especially in a highly uncertain environment, it is crucial defining a proper structure rather than worrying about what strategic objectives to pursue (Hill and Birkinshaw, 2008).

2.2 External Corporate Venturing Activities

Zooming in on the domain of external venturing, after the theorisation of Open Innovation by Chesbrough (2000), corporates have understood the importance of opening the boundaries of innovation processes with external players to find the optimal global solutions and benefit

from broadcast research in nowadays complex innovation systems (Nelson, 1959; Dahan and Mendelson, 2001; Terwiesch and Ulrich, 2009; Jeppensen and Makhani, 2010). All the Open Innovation activities carried out with external entities are under the domain of External Corporate Venturing and refer to equity or non-equity relationship between the corporate and external partners with the final aim of creating new businesses (Schildt et al., 2005).

Three are the main models that a firm can leverage:

- i) Venturing alliances, namely joint ventures and non-equity investment. Non-equity investments refer to alliances to develop new businesses with new partners through a contract without relying on an ownership mechanism. On the other side, venturing alliances refer to a partnership between two companies leading to the formation of a new and separated legal entity that allows them to pursue new opportunities
- ii) Corporate Venture Capital, corporate investment units through which the parent participates in the private equity market. The unit can be less or more integrated with the corporate according to the CVC program's structure
- iii) Transformation arrangements, i.e., acquisition and spin-offs (Keil, 2000; Sharma and Chrisman, 1999). The acquisition consists of the internalisation of an independent venture by the corporate through the acquisition of the majority of its share capital. The acquired venture may be operationally integrated or just continue as a relatively independent company (Laamanen, 1997). A spin-off is an internal project that is spun off operationally and legally, of which the corporate may or may not retain control. Technology spin-offs are created to commercialise research discoveries outside the business (Gavin, 1983).

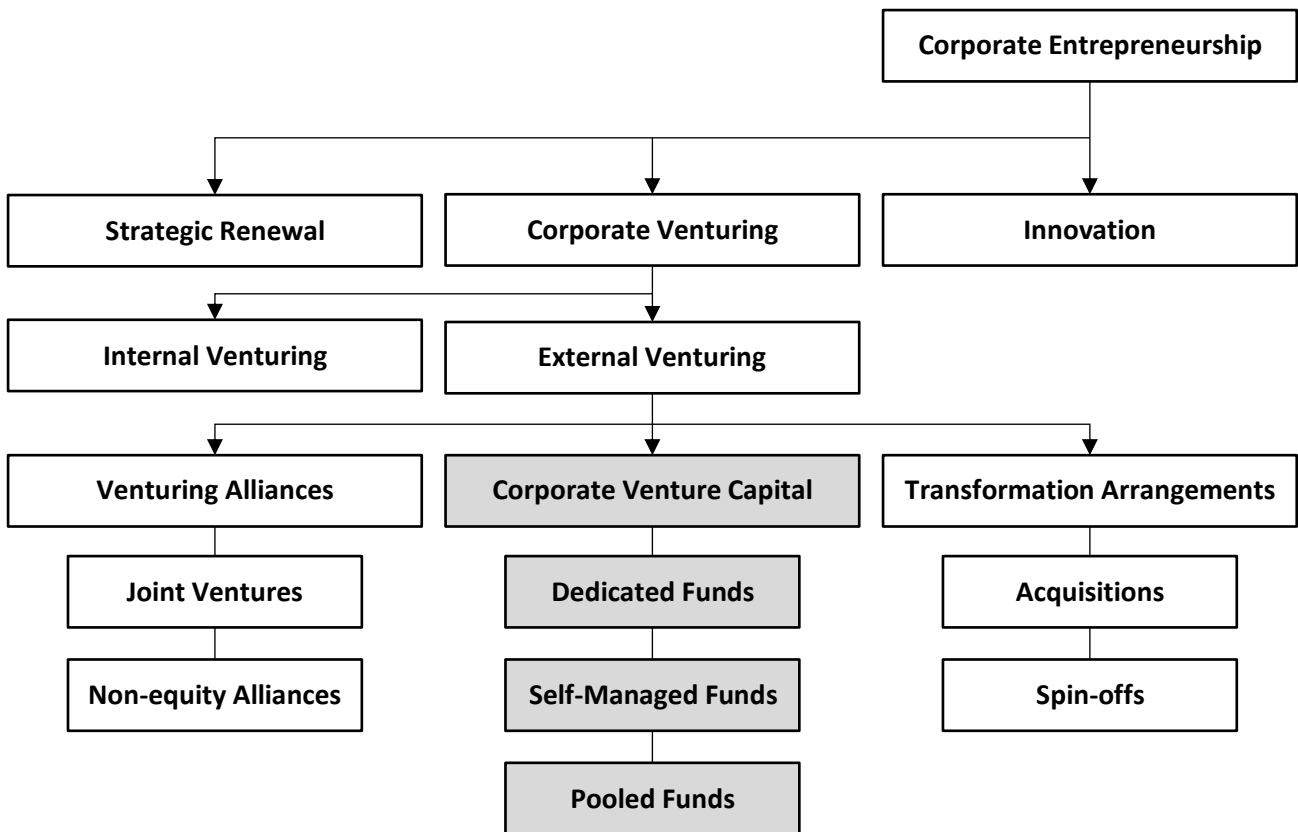


Fig. n.2 - Adaptation from Rohm (2018), Corporate Entrepreneurship

2.2.1 External Corporate Venturing Structure

When considering the correct type of external venturing, corporates should consider the locus of opportunity and strategic logic mentioned above, but, in this case, adopting the former by using a new lens. Indeed, to better understand the locus of opportunity in an external-only environment, it is necessary to consider the degree of integration involved in the three external venturing modes; in other words, the extent to which the external venture's activities will be within the boundaries of the firms. This element is fundamental as it determines the external venturing activities' governance model (e.g., Burgelman, 1984; Roberts & Berry, 1985). Considering the corporate perspective, the most arm-length relationship is the CVC investment, as it only interacts with the venture through the dedicated CVC unit (Keil, 2002). On the other hand, the most integrated venturing mode is transformation arrangements formed between a Business Unit and a new venture, thus implying a more robust level of integration (Schildt et al., 2015).

Schildt et al. (2015) argue that the degree of vertical integration of the external corporate venture capital program is strategically essential to determine the type of innovation that the corporate is going to pursue in terms of exploitation and exploration (March, 1991), i.e., their strategic logic. Less integrated external corporate venturing activities, thanks to their low level of investment, entails low risk; thus, they should entice the company to explore new business opportunities. The inter-organisational theory well explains this phenomenon by leveraging on two variables influencing the learning process (i.e., improvement in innovation rates):

- i) Technological relatedness, i.e., corporate venture units and the external entities interact thanks to technological similarities
- ii) Downstream vertical relatedness, i.e., the interaction via a customer-supplier relationship (Schildt et al., 2005).

Concerning the technology relatedness, firms dealing with entities with a similar technological knowledge base should learn more easily than the opposite, as theorised by Cohen and Levinthal with the concept of absorptive capacity. Therefore, if two entities are used to deal with the same technologies, it should lead to small incremental learning, i.e., exploitative innovation (Schildt et al., 2005). The more integrated venture capital model should favour the less costly and risky interaction with similar external ventures leading to a higher degree of exploitation. Conversely, the opposite happens with less integrated models where the exploration degree is higher than the previous case.

Regarding the downstream vertical relatedness, CV units that closely interact with customers are under pressure to deliver innovations proposed by them. Christensen and Bower (1996) showed how this innovation mechanism leads to small incremental improvements. Indeed, the two entities are more likely to possess the same knowledge base regarding their value network. Consequently, more integrated CV programs tend to interact with corporate customers and, therefore, pursue exploitation; on the other hand, less integrated ones are more prone to address a different client base and increase the exploration degree.

Indeed, the evidence demonstrated that venture alliances - due to their lower level of integration - lead to more explorative learning than transformation agreement; corporate venture capitalists instead provided mixed results, underlining its complexity (Schildt et al., 2005). CVCs can be focused on a broad set of objectives simultaneously, beyond the sole learning, such as to monitor and develop new technologies, markets, and business models

(Block and MacMillan, 1993; Maula et al., 2003b). Thus, contingency may affect the innovation pursued.

To sum up, the external corporate venturing activities may take different forms that differ according to their locus of opportunity - i.e., governance mode - and strategic logic - i.e., exploitation vs exploration. The first determines the degree of vertical integration between the corporate and the CV units. The latter will determine the typology of innovation pursued. When defining the strategic logic, the corporate should take into account that the governance mode influences the degree of exploration and exploitation within the unit (Schildt et al., 2005). Moreover, as Hill and Birkinshaw (2008) pointed out - in corporate entrepreneurship - the governance mode will likely determine the actors with whom the CV units will interact. The differences between the actors' knowledgebase is another element that can influence the exploitation and exploration degree of CV units (Schildt et al., 2005).

The interesting element is the nature of Corporate Venture Capital as an External Corporate Venturing initiative. Even though it is the most arm-length relationship, it allows the corporate to learn and monitor and develop new technologies, business model, and markets. On the other side, organisational learning outcomes, i.e. the exploration vs exploitation degree, are not straightforward, and they may generate problems in the definition of strategic logics. As a consequence, the internal consistency (Hill and Birkinshaw, 2008) between strategy and locus of opportunity will be more challenging to achieve.

This seems to be confirmed by CVCs history, which is characterised by cyclical ups and downs. However, the latest trends have been showing that corporates have understood how to harness their potential as Corporate Venture Capital activities are constantly increasing.

2.3. The History of CVCs¹

CVC-related topics are gaining momentum both among practitioners and scholars thanks to the nowadays widely accepted practices of Open Innovation and Venture Funding. However, CVCs experienced a long history of cyclical up and downs that granted them the name of "tourist capital" (Vidra, 2019). The reason behind this is to redirect to the captive nature of

¹ CBInsights, The History Of CVC: From Exxon And DuPont To Xerox And Microsoft, How Corporates Began Chasing 'The Future', [link](#)

the fund. CVC investments are bound to corporate free cash flow and are strong in a positive period for the market, while they suffer from unstable economic conditions. Overall, the venture capital market has experienced four "waves" of CVCs that have been synchronous to market trends.

2.3.1 First Wave

CVCs started in the earliest period of the US's first big corporations. In 1914, DuPont, the chemical and plastics manufacturer, invested in General Motors (GM). The investment was a success, with the stock value increasing seven-fold over World-War I as wartime increased the demand for automobiles. The returns were not only financial, and the relationship between the two became intertwined. More precisely, the increase in GM products expanded the demand for DuPont's goods. The return was double. On one side, purely financial considering the stock value; on the other, strategic considering the products' complementarity. It was one of the first examples of how a corporate can adopt a mixed strategy whilst pursuing corporate venturing activities.

However, the first wave of CVCs started in the late '60s in the US, 20 years after the first independent venture capital fund. The success of IVCs attracted US companies' attention. Big corporates were trying to diversify their portfolio to circumvent the strict post-Great Depression anti-trust rules, which prevented them from exerting a desired level of control in their markets. In research for new opportunities to increase profit, corporates realised that corporate venturing could become a new profit stream. They started to adopt CV programs with three main driving motivations. First, they wanted to expand their portfolio of products and market; second, they had an excess of cash, and they were looking for lucrative investment opportunities; third, they were trying to imitate the success of the IVCs, which provided a model to follow.

Conglomerates from any industry had set up their investment arm. Gompers and Lerner (2000) report that 25% of the Fortune 500 companies invested with their CVC arm over the '60-'70 decade. The first successful corporate venture organisations such as Digital Equipment, Memorex, Raychem, and Scientific Data System spurred the practice adoption.

Among the many models adopted, two were the most widespread. The first was the most rudimental, where CVCs act as mere investors providing funds to other independent venture

capitalists. In contrast, in the second, the corporates set up CVCs as units - either internal or external the organisation boundaries - dedicated to investing directly in startups.

The more emblematic program was Exxon Enterprises. Exxon was probably the largest investor in the 70s, and it aimed to exploit the underutilised technologies of the corporate's R&D laboratory. The group invested in companies that were far outside Exxon's core business, such as computer systems, air pollution mitigation technology, text-editing machines, surgery equipment. Diversified investments were the only way for the company to avoid anti-trust litigation. Over time, diversification became a double-edged sword: Exxon became impatient with all these investments and tried to consolidate these ventures under the corporate structure. Entrepreneurs, who had been promised freedom, did not welcome the decision and reduced their efforts left. As a result, Exxon lost millions of dollars.

The diffusion of corporate venturing practices stopped after the IPO market crash in 1973. The IPO market is the main exit path for IVCs and, when it started collecting below the average return, they encountered difficulties in raising additional funds. Corporates, new to the venture capital market, opted for the conservative choice of closing their CVC program. It highlighted, for the first time, the susceptible nature of CVCs towards the financial market. Moreover, in the 70s, companies experienced the shareholder revolution and the corporate raiders issues, putting an end to the desire for diversification that led the first wave.

2.3.2 Second Wave

The second wave of CVCs started in the early '80s in the US. The generating factors were three. First, the decrease of capital gains taxes in 1978; second, the 1979 amendment to "prudent man" rule governing pension fund investments that allowed pension managers to invest in high-risk assets; thirdly, solid financial markets for public offering (Gompers and Lerner, 1998; Gompers, 2002). The corporate venture capital investment represented 12 per cent of the overall venture capital market in 1986. Personal computer's hardware, software, and the pharmaceutical industry drove the second wave's investment opportunities in high-tech companies. For the first time, companies were not solely looking within their organisational boundaries for innovation to diversify the business. The new wave of technology changes this perspective, with corporates realising that they must engage with external innovators to avoid becoming obsolete. Moreover, a new supply of entrepreneurial talents was entering the

market, inspired by Bill Gates and Steve Jobs's success. At Harvard, two-thirds of the students enrolled in management entrepreneurship, and 80% wanted to fund and manage their own business. One hundred sixty schools offered entrepreneurial courses, a significant increase compared to the sixteen in the seventies.

The range of CVC organisational models became broader as corporates decided whether to invest directly in startups by themselves or via IVCs or create their own CVC unit. Some of them pursued multiple avenues per time. This wave's motivations recalled the first wave's ones, but this time, the corporate approached CVC programs with a more disciplined method to diversification: the investments mainly were related to early access to adjacent technology or product lines. However, over this period, CVCs' precarious nature emerged with an average lifespan that shrunk to 2.5 years (Dushnitsky, 2006).

In the second wave, corporate investors did not solely come from the tech industry like AT&T, but also chemical (Colgate), manufacturing (General Electrics (GE)), and automotive industry (General Motors (GM)). Moreover, for the first time, Japanese corporates create CVC programs which they mainly exploited to invest in US startups.

The most prominent corporate investor in the second wave was Xerox. In the 1960s, they became famous for the innovation park "Palo Alto Research Centre" (PARC), whose objective was to generate innovative technology that ultimately would increase the demand for Xerox' printing products once they hit the market. Even though the massive amount of innovation generated within it, the corporate was not able to fully capitalise on its potential. The emblematic case was the Apple release of Macintosh that, according to Xerox, commercialised technologies developed at PARC. The Apple case led to a restructuring of the CVC program PARC, which became Xerox Technology Venture (XTV) in 1988. The XTV's final aim was to exploit and monetise technologies created in PARC and other Xerox's labs. The program was modelled as an independent VC firm, one of the earliest in history with this imprinting. The managers received autonomy to guarantee speed and flexibility, and their objective was to maximise ROI. Many companies were financed as a spin-off of Xerox's technology, and XTV was an incredible financial success with an IRR of 56%. Internal tensions lead to the program shut down. The XTV managers were paid lavishly with incentive-based compensation, which generated tensions with other BUs' managers that believed that XTV's startups succeeded at the expense of Xerox resources.

The wave ended with the 1987-market crash. CVC investments ended up representing only 5% of the total venture investments in 1992.

2.3.3 Third Wave

It is necessary to wait until the middle of the '90s for the third wave to start, underpinned by increasing interest from US and European's corporations (Dushnitsky, 2011). Even in this case, the surging number of programs were spurred by IVCs' success. However, for the first time, corporates realised that innovation could happen outside their R&D departments, such as collaborating with universities, joint ventures and acquisitions. The Open Innovation paradigm (Chesbrough, 2002) started spreading, and the CVC program was the perfect instrument to harness its benefits. Companies that had relied on R&D experimentation to drive innovation usually piled up unused new technologies that ended up being commercialised by more agile competitors, namely startups. CVCs were the perfect conduit to exchange innovative ideas with external players and either outsource the languishing ones or internalise the most promising.

Moreover, the third wave was driven by the diffusion of the internet: companies - understanding its power but lacking all the internal capabilities to manage it - relied on external sources of opportunities through CVCs (Gompers, 2000). For example, big corporations like Sony Corporation or the United Parcel Service (UPS) created units to invest in online businesses. Indeed, the profile of the typical CVCs investor changed: not only companies with an R&D department, but also Media and Advertising companies created their venture investing arm, like the German media conglomerate Bertelsmann AG that set up a US\$ 1 Bn fund - underlining also how the scale of the CVC program had changed. Overall, the CVCs approached the third wave not only to enter new markets or to expand product lines but also to support and defend existing products by creating an ecosystem around them. On the other side, CVCs' growth also accentuated organisational issues, notably connected with the compensation scheme. It became impossible for corporates to justify enormous pay-outs to CVCs' investment managers, and they opted for a more corporate-like salary. Thus, being unable to attract top investment managers financially, they opted to train them internally, even though, in the end, they would end up seeing them switching to IVCs to get a better salary. Despite this tension, independent venture capital groups started looking for strategic

partnering opportunities with corporate venture capital arms for the first time. Before this wave, IVCs had considered CVCs with scepticism due to their cyclical nature. This time they saw corporate partners as a source of potential strategic advantages (Gompers, 2002). Partnering with CVCs unlocked new business strategies that leveraged the expertise of large corporations.

The most notable case in the third wave is Intel Capital, founded in 1991 to centralise the external investments that each unit previously handled. In the beginning, the venture units were focused solely on expanding the product lines, but in the mid-1990, Intel Capital received the mandate to widen the ecosystem surrounding the corporate's products with the final aim of improving market condition. They usually offered company building services (i.e., access to complementary assets) alongside with improving the value of Intel's products. Intel Capital's success is linked to its long-term goals that allowed them to insulate to the cyclical nature that had hurt many peers. Indeed, despite its financial success, the fund had always been based on strategic value.

The third wave's peak was registered in 2001 when the CVC investments accounted for 15% of the total investment (National Venture Capital Association - NVCA), and a sharp decline followed the dot-com bubble burst. Many CVCs wrote off billions of dollars, and at the end of the burst, by 2008, most of them were not sure which startups in their portfolio were still in business or not (Dushnitsky, 2006). Many corporates decided to drop their CVC programs. However, not all the companies pulled out of the market, especially biotech and pharma, kept their funds up and running.

2.3.4 Fourth Wave

CVC investments bounced back earlier and stronger by the end of 2008 when the highest number of deals was registered in six months with 390 deals. (NVCA). By 2009, 20% of Fortune 500 companies invested in CVC programs, increasing the average lifespan from 2.5 years to 3.8, with 40% working for more than four years (Dushnitsky, 2011). Even though the number of deals increased faster than previously, the main issue was the absolute amount of dollars poured in by CVCs investors that accounted for the US \$ 5.1 Bn, far less than the third wave figures. It was necessary to wait until 2014-2015 to appreciate investment levels as before.

Overall, in the last decade, CVCs have been widely adopted in different industries. However, this time, their concentration is spreading worldwide and no longer only in the US and Europe. Indeed, China and Israel are now increasing their contribution to the industry (Telstra, 2017). In 2018 the Corporate Venture Capital units were 438 worldwide, more than doubled compared to the 176 in 2008². In the same year, 77% of Fortune 100 companies invested in venture capital, meanwhile half of them (52%) had set up their investment's arms. For the first time in 2018, the CVC investment in the US represented the highest portion of VC investment accounting for 52% of the total for a value of 71 US\$ 71.1 B. On the other side, in Europe, corporations appeared to be slower in adopting corporate venturing, with CVC investments representing 38.7% of the total for a total value of US\$ 8.87B.

The engine that determined the resurgence of CVC investments in this period were two. First, the rise of social media and smartphones led to the fourth wave. However, it is worth noting that, over this period, healthcare surpassed software and hardware as the most invested sector. Secondly, corporates piled up extra cash that they needed to invest while global interest rates were low. It also represented an excellent opportunity for incumbents to monitor and discern where the disruption's origin.

The results of CVC investors validate the fourth wave's success. For example, Google Venture (GV). GV is Alphabet's investment arm, Inc. and one of the most active CVCs in the world. They invested in different fields such as cybersecurity, transportation, and agriculture, among others. Salesforce Investment realised 222 investments raising more than 250M that they deployed to create the world's largest ecosystem of enterprise cloud companies. Cisco Investment (CI) is now more than 25 years old and has invested in hundreds of new ventures in different segments. CI has committed over 300 M to invest in businesses, intending to shape the global networking system's future. In recent years, Chinese-based CVCs are taking the scene: between 2011 and 2016, Asia increased the CVC investment from 13% to 28%. Alibaba in 2016 invested only in the first half of 2016 US\$2.7, while Tencent US\$3.6B.

However, the most exciting example is Microsoft Ventures. At the beginning of 2016, the company decided to reactivate its venture investment and founded its first structured CVC unit, Microsoft Ventures. The goal was to maximise financial return as well as pursuing strategic benefits. In other words, Microsoft Ventures main targets were software startups for

² PitchBook (2019), PitchBook Analyst Note: The Golden Mean of Corporate Venture Capital, [link](#)

which the company could provide the most help and technical support in the post-investment phase and at the same time expose the corporate to new technologies and business models; they selected them according to some parameters in terms of strategic goals, and then they matched them with the financial ones. The presence of financial goals was necessary to maintain a given degree of flexibility, as Intel Capital did. Portfolio companies were not obliged to work with Microsoft. However, their CVC offers:

- i) Technical integration with Microsoft's product such as Azure;
- ii) Go-to-market help by leveraging on Microsoft's sales department;
- iii) Promotional services by featuring it as a portfolio company.

2.3.5 Future Outlook³

The positive trend for CVC does not end here. Telstra Ventures (Telstra, 2017) forecasted that direct corporate investment and CVC investing would account for 35% of the total VC investment by 2025. This wave seems to be different as corporates are becoming more aware of CVCs' strategic benefits and importance (Rossi et al., 2019), making them more stable than in the past. Moreover, the new interesting element is that customers indirectly sustain this wave by demanding more environmentally-conscious practices requiring tremendous innovation (Paraponaris, 2009).

The mixture of financial and strategic goals keeps going. Some companies employ different investment strategies via multiple funds' typologies, such as internal funds, direct investments, or subsidised funds. However, trends show that CVCs are getting back to origins: companies outside the tech sector invest in corporate venturing programs, such as food and beverage. It underlines the CVCs nature: a tool enhancing the corporate's strategies and products both in the present and in the future.

³ CBInsights, The 2019 Global CVC Report, [link](#)

2.4 Corporate Venture Capitalist (CVC)

Corporate Venture Capitalists (CVCs) are the incumbent firms' investment vehicles entitled to carry out direct minority investments in entrepreneurial ventures as a standalone investor or as a limited partner (NVCA, 2001; Gompers and Lerner, 2000). CVC Investing is highly risky (Amit et al. 1998) due to uncertainty in new ventures' demands and markets (Kaplan and Stromberg, 2004; Scherer, Harhoff and Kukies, 2000); thus, CVC's managers are responsible for carrying out screening activities – to reduce adverse selection - and monitoring activities – to reduce moral hazard – from the entrepreneurs.

A triadic relationship involving the CVC unit, the startup, and the corporate characterises CVCs. They act as an intermediary between the other two parties, and their activities can bring benefits to all of them. Concerning the startups, CVCs provide them with complementary assets (Chesbrough, 2002) that help overcome resource constraints (Maula et al., 2005). On the other side, CVCs can bring several benefits (innovativeness, increase in sales) to the corporate (e.g., Dushnitsky and Lenox, 2005b), underlining how the final objectives of CVCs are not only financial but mainly and firstly strategic (Yost and Devlin, 1993; Erns&Young, 2002; Chesbrough, 2002). The substantial weight of strategic goals in CVC programs (Kann, 2002; Tyeebe, 2001; Macweicz and Partner, 2003) forces them to operate considering the corporate's objectives (Zu Knyphausen-Aufseß, 2010) and determines their classification as a strategic investor, i.e., an investor whose assets' value is affected by the investee company (Hellmann, 2002). They aim to find new ventures congruent with the corporate's core technology and open opportunities for future synergies, saving cost (NVCA, 2001; Dushnitsky and Lenox, 2005a; Wadhwa and Kotha, 2006), or improve sales and profit (Chesbrough, 2002). CVCs investments guarantee to gain early access to new technologies, new market, or complementary products, enhancing the demand of the corporate's core product or improving its innovation rate (Fast, 1978; Siegel et al., 1998; Benson and Ziedonis, 2009). However, CVCs consider financial objectives too. The corporate wants to obtain attractive financial returns, at least of the same level of private investors (Chesbrough, 2002) - after having accounted for non-monetary, strategic benefits.

The intensity of the two objectives depends on the corporate's strategic choices (e.g., Hill et al., 2009) of the fund strategy and its structural organisation (e.g., Fischer et al., 2019; Souitaris and Zerbinati, 2019).

As a rule of thumb, corporate investors' final aim is to increase corporate value (Dushnitsky, 2006; Hellmann, 2002).

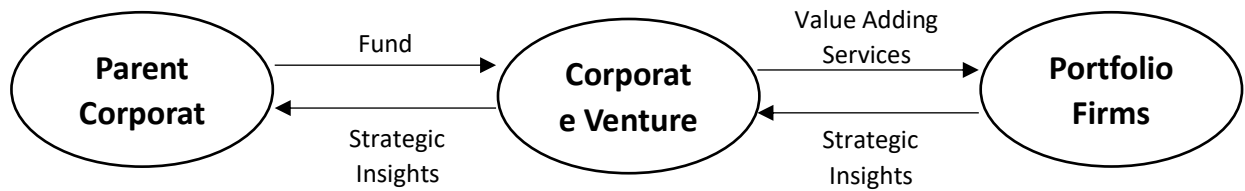


Fig. n.3 – Triadic Relationship in CVC

2.4.1 Corporate and its Influence on Longevity

The presence of corporate investors has led CVCs to be historically less stable than the independent counterpart. However, during the 2000s, the average lifespan had increased (Dushnitsky, 2011). As a captive investor, the key to the program's longevity is a solid strategic goal as it allows to not directly depend on market conditions and technological discontinuity that affect firms cash flow (Gompers and Lerner, 2000; Hellmann et al., 2008; Dushnitsky, 2011).

Analysing the survival issues from a behavioural theory point of view (Cyret and March, 1963), the corporates decide to accept an operational risk when setting up the CVC unit and decide whether to close it or not according to the feedback on aspired performances (Schneider, 1992). In other words, corporates set up pre-defined goals, which depend on the industry average performances, and then check the results obtained. If the feedback on their aspired performances (Schneider, 1992) is not as good as expected, the managers will likely close the CVCs program (Gaba and Bhattacharya, 2012) as they are more comfortable returning to well-known R&D practices (Gilbert, 2005). The same will likely happen if the innovation performances obtained are above the aspiration level; managers become more confident in internal R&D (Gaba and Bhattacharya, 2012).

To sum up, the program's longevity is a function of the corporate's innovation rate compared to the industry average that consequently dependant on pre-defined strategic goals (Gaba and Bhattacharya, 2012).

2.4.2 CVC Investment Processes

Following the Institutional theory point of view, rules and culture drive decision making and define logics in a given institutional field (Lounsbury, 2007). Different logics lead to practice variations between different organisations in the same fields (Greenwood et al., 2011; Pache and Santos; 2010; Thornton, Ocasio, and Lounsbury, 2012). Thus, concerning the Venture Capital world, CVCs have different characteristics in their investment decisions and practices compared to IVCs. More precisely, CVCs have a dual and peculiar nature as they have to satisfy both strategic and financial objectives (Chesbrough, 2002). The strategic goals prevent the CVCs to adopt the IVCs practices as-is since they are tailored to maximise financial return. The corporates exert institutional pressure (DiMaggio and Powell, 1983) on the CVCs and push them to conform to the parent's strategic mandate. Therefore, the introduction of new strategic objectives completely changes the units' organisation (Hill and Birkinshaw, 2008) that have to find new paths to satisfy both strategy and finance. Consequently, the CVCs activities present differences compared to the IVCs' ones in every phase of the deal, starting from the origination to the monitoring (Gompers and Lerner, 2000; Souitaris and Zerbinati, 2014).

Deal Origination

Regarding deal origination, the parent company represents an additional source of deals for CVCs. Many referrals on potential targets usually come from the corporate's business units (Souitaris and Zerbinati, 2014). The interaction with parents allows them to obtain pre-screened deals reducing information asymmetries on prospects; but also, it can guarantee alignment between the CVCs and the parent's strategic goals (Souitaris and Zerbinati, 2014). Moreover, CVCs couple internal and IVC-sourced information. The interaction with IVCs in this phase allows them to gain pre-screened opportunities and insights on the required capabilities to become an established IVC (Hill et al., 2009).

Deal Screening

Concerning deal screening, conversely to what is suggested by some theoretical models (Fulghieri and Sevilir, 2009), CVCs tend to invest in companies at a later stage of development or that have undergone other investment rounds (Gompers and Lerner, 2000; Gompers, 2002; Masulis and Nahata, 2009; Dushnitsky and Shapira, 2010). CVCs have higher risk aversion than IVCs determined by peculiar organisational characteristics (Dushnitsky and Shapira,

2010). If they invest in earlier stages, CVCs usually target new ventures belonging to related industries (Gompers, 2002) that have a strategic potential for the parent (Souitaris and Zerbinati, 2014). It represents positive news underlining how CVCs can provide for and receive from value to young entrepreneurial ventures (Gompers, 2002). It is worth noting that there are some geographical differences in new ventures targeting connected to the Venture Capital market's maturity level (Bertoni et al., 2015a); in Europe, the IVCs sector is still immature and, thus, it tends to avoid riskier investments in early-stage startups. Consequently, the CVCs invest at an earlier stage to fill the void left by the IVCs in the capital market (Bertoni et al., 2015a). Secondly, CVCs usually focus on high-tech startups that exhibits a higher innovation rate (Park and Steensma, 2013), preferably located nearby them (Gompers and Lerner, 2000; Gompers, 2002; Wadhwa and Basu, 2013), whose business strategically overlaps with the corporate's ones and can guarantee potential strategic value for them (Souitaris and Zerbinati, 2014). These characteristics should favour the interaction between the two parties - usually more intense than in a standard IVC investment case - as both look for leveraging on technological synergies (Park and Steensma, 2013). Concerning geographical proximity, new trends are showing that CVC investments are even more used to learn about geographically distant markets or technologies (Dushnitsky, 2011). Third, before proceeding with the next stage in the deal flow, CVCs usually report feedback on technologies and market to different BUs to maintain a strategic connection within them (Souitaris and Zerbinati, 2019).

Deal Evaluation and Due Diligence

Regarding deal evaluation and due diligence, unlike the IVCs, they do not rely solely on external consultants (Fried and Hisrich, 1994) but also on the internal resource from the Business Units that can advise them on the new technologies. The internal technical expertise represents a mechanism to reduce information asymmetries and adverse selection (Wright and Robbie, 1998). Once evaluated the potential target, CVCs usually have to obtain a sponsor within the limited partner, i.e., the corporate (Souitaris and Zerbinati, 2014), before proceeding with the investment. Sometimes it is not a formal procedure but still represents a good practice to ensure the alignment between the parent and the CVCs (Souitaris and Zerbinati, 2014).

Deal Structuring and Approval

Concerning the deal structuring and approval, CVCs do not syndicate with similar funds as IVCs do, but they prefer to partner with complementary funds, i.e. IVCs themselves. Partnering

with other CVCs may generate strategic tensions, while on the other side, IVCs offer complementarity resources and benefits (Souitaris and Zerbinati, 2014). By mainly syndicating investments with IVCs (Jaaskelainen, 2012), CVCs reduce the risk exposure and simultaneously improve their ability to spot new ventures with a strong strategic fit (Yang et al., 2009). CVCs' strategic goals effects also the new venture evaluation. Startups receive a higher investment amount from CVCs than from other ventures funds (Gompers and Lerner, 2000; Hellmann, 2002; Masulis and Nahata, 2009; Guo et al., 2015). Two are the main reasons. First, CVCs obtain non-monetary benefits from the investee, which the capital market factors in through a premium on the investments (Gompers and Lerner, 2000; Hellmann, 2002). The premium is even higher if the corporate and the startups compete in the same market (Masulis and Nahata, 2009). Secondly, CVCs invest the corporate's spare financial resources (De Gbadji et al., 2011), and their cost of capital is lower than independent investors. These elements lead to a lower discount on the startup's future value, resulting in a higher valuation (Guo et al., 2015).

Deal Monitoring

Concerning deal monitoring, CVCs carry out company nurturing services. More precisely, corporates have many unused resources (Basu et al., 2011; De Gbadji et al., 2011), i.e., complementary assets, such as network, facilities, industry-specific knowledge valuable to new ventures. CVCs act as a matchmaker connecting those resources with ventures (Souitaris and Zerbinati, 2014). CVCs usually focus on building the value infrastructure (core activities, resources, and partnership) and value delivery (mainly distribution and communication channels) (Gutman et al., 2019; Bertoni et al., 2015a; Colombo and Murtinu, 2017) and the product/technology (Santhanakrishnan, 2003) of the ventures. Conversely, IVCs are more focused on company building activities that relate to the value capture (Revenues Model) and delivery (distribution and communication channels) sides of their business model (Bertoni et al., 2015a; Colombo and Murtinu, 2017). Finally, the above-mentioned lower costs of capital (Guo et al., 2015) impacts also on the investment duration of the CVCs funds. The funds depend on spare financial resources that the company decided to dedicate to finance innovation (De Gbadji et al., 2011). It follows that CVCs are less time-constrained than IVCs which have to invest by using other investors' money. Thus, CVCs enjoy a lower cost of capital that stretches the investment period (Guo et al., 2015). They are more patient investors than IVCs, and this element aligns with their final aim of nurturing new ventures. The nurturing

activities are a double-edged sword for startups as the more the technology develops, the higher the risk of misappropriation (e.g., Hellmann, 2002). Indeed, CVCs and new ventures suffer from higher moral hazard as the former can leverage the latter's lack of resources to pursue rent-seeking behaviour such as technological misappropriation (e.g., Hellmann, 2002). The risk can get worse if CVCs hold board seats. New ventures try to hedge this risk by leveraging on two tactics. First, they limit the CVCs' control rights via board seats; indeed, the evidence shows that they tend to award less board representation. Secondly, new ventures try to avoid investment rounds where CVCs are the lead investors (Masulis and Nahata, 2009).

DEAL STAGES	CVC PECULIAR PRACTICES
<i>DEAL ORIGINATION</i>	<i>Practice 1: Referrals from parent's business units other than relying on the network of personal contacts in the VC industry</i>
<i>DEAL SCREENING</i>	<i>Practice 2: Strategic Potential for the parent is factored in the evaluation rather than mere financial results.</i> <i>Practice 3: Targeting co-defined with the parent rather than having financial returns as leading KPI</i>
<i>DEAL EVALUATION</i>	<i>Practice 4: Internal rather than outsourced technical due diligence on technology</i> <i>Practice 5: Secure a sponsor within the parent to secure resource commitment</i>
<i>DEAL STRUCTURING</i>	<i>Practice 6: Syndication with complementary funds only</i> <i>Practice 7: Corporate involvement in deal approval to ensure strategic fit</i>
<i>DEAL MONITORING</i>	<i>Practice 8: Connecting portfolio venture to the parent to provide value-added services and simultaneously provide access to the new technology</i>

Tab. n.3 - From Souitaris and Zerbinati (2014), CVCs' Deal Flow

2.4.3 CVC Types – Different Classifications according to scholars

Scholars have tried to classify CVCs according to several parameters with the final aim of capturing their heterogeneity. This paragraph presents the results of different classification studies.

Chesbrough (2002) proposed a classification based on i) link of operational capabilities, i.e., the relatedness between the startup and the parent's operation activities. There can be a close link between the startup and the corporate operation if the competences owned are related to the startup's core business; otherwise, the link will be defined as loose; ii) the corporate investment objective. The CVC objective can be either strategic or financial. The strategic objective underlines the willingness to exploit opportunities from external boundaries in terms of technology and innovation. The financial objectives are typical of those CVC programs that pose great attention towards return on investment.

Thus, Chesbrough (2002) groups CVCs in four different categories: i) Emergents which distinguish themselves for tight operational links and financial objectives; they allow the corporate to exploit potential new business opportunities. The rationale behind this relates to betting on new and unexplored business areas that will either become the businesses' future core or bring a proper financial return; ii) Drivings are characterised by tight links and strategic objectives. In this case, the CVC investments are directed towards advancing the current business strategy. The rationale behind this relates to the exploitation of the investment as a window on new technologies and practices. The corporate works closely with the startup to exchange as much information as possible in order to improve its strategy and core business, but also to become more sensitive to potentially disruptive technologies; iii) Enabling investments are characterised by loose linkages and strategic objectives. The corporate identifies strategic benefits in working with startups that operate in a domain complementary to its operation. Usually, for this investment, the corporate co-invests with others as it does not own the capabilities to monitor them successfully. The strategic benefits are usually indirect, i.e., the development of the startup technologies will bring benefits to the corporate's core product; iv) Passive Investments are characterised by loose linkages and financial benefits. Usually, these investments should be avoided as they require an

organisational setting that enables proper mirroring and screening activities typical of a private equity firm and that the CVCs cannot fully provide.

To sum up, the company should investigate its boundaries to understand its capabilities and its strategic needs before deciding what type of CVC programs to undertake. Each of them can drive the company's growth if carried out consistently with the overall company-wide strategy.

Zu Knyphausen-Aufseß (2010) classifies CVCs by analysing the corporate's origin and profile and the CVC's focus. With 'origin and profile of the corporate', the author refers to the industry to which the corporation belongs. He identifies two main categories i) the established-industry incumbents; ii) the 'new style', knowledge-based corporates such as startups or consulting companies. Concerning 'focus', he refers to the final aim of the CVC activities, that following the NVCA definition, is either to create synergies or cost-saving.

Subsequently, the author identifies four different types of CVCs: i) management consulting firm CVCs, they are investment arms from players that are not incumbents in any industry sectors but possess a massive set of knowledge to deploy. They focus on creating synergies with the investee firms rather than accessing to new technologies; ii) non-technology-oriented industry incumbent CVCs, investment arms of firms whose core product is not tech-related such as financial services, media companies. For this reason, they usually invest in looking for opportunities to create synergies or cost-saving; iii) technology-oriented industry incumbent CVCs, programs set up by firms operating in tech-related or high-tech sectors, where the technological part is the core in their business. As a consequence, their focus is to get access to new technologies iv) growth-oriented startup CVCs, investment arms of big startups that do not have a structured process in defining the budget for innovation activities, but usually have spare resources after the IPO that they can reuse to invest in innovative projects (Zu Knyphausen-Aufseß, 2010). As the new startup's business model involves innovation and technology, it is reasonable to expect that their CVC arm focuses on technology.

Rohm et al. (2017) suggested a new lens through which to analyse CVC investment. They look at the CVC unit's motivation, more precisely their mission statement and their assumptions about themselves, suggesting that they can reveal the CVC strategic orientation towards its investments (Dushinitsky and Shapira, 2006). The authors were able to identify four categories

of CVCs: i) strategic CVC: they are striving to reach strategic benefits from their investment by looking at emerging technologies in related industries to build synergies with them; ii) Financial CVC: they are interested in financial return and, as a consequence, do not have industry-specific targets since their investment strategies and their investments change according to their risk-level; iii) Analytical CVC: they present a moderate level of both strategic and financial motivations. Their approach seems to balance the limitations of the IVC versus CVC approach. Therefore, they offer a corporate investor's typical benefits (e.g., complementary assets, stamp of approval) while paying attention to the financial return; iv) Unfocused CVCs: they score low on the strategic side but show a moderate level of financial orientation. They usually provide seed investment or growth-stage financing to help entrepreneurs and obtain a decent financial return.

Gutmann et al. (2019) proposed a different classification. They provide a taxonomy according to the activities carried out by the CVC units. More precisely, they classified activities into i) value-capturing services, i.e., that help the startup to capture value. They can be formal such as expanding the customer base and introducing new suppliers, or informal such as expanding the business network within the corporation and the industry; ii) value-creation services, i.e., all the services that help portfolio companies to build functioning value-chain. Corporates can support them in core business activities such as operation, strategy, product development, business support activities such as legal or recruitment, and reputational activities such as branding.

Consequently, the authors divide the CVCs into four categories: i) Harvester: these CVCs focus on providing value-capturing services instead of value-creating services. The goal is to develop the portfolio firm's revenues and increase the possibility of a positive financial return; ii) Builder: they offer a full range of value-creating and value-capturing services. The corporate's intrinsic motivation is to build an ecosystem for their product that can lead to new and innovative collaborations; iii) Enabler: these CVCs score high in value-creating services but low in value-capturing services. The rationale behind them is to foster innovation and transformation by facilitating the collaboration in value creation between a given BUs and portfolio ventures; iv) Observers: they score low on value-creating and value-capturing services. Their main objective is to gather insights on new technologies, markets, or business models.

The author argued that the CVC should select which services it wants to provide according to the internal capabilities. The venturing unit must ensure that it possesses all the competencies necessary to deliver the specific services. Simultaneously, it should carefully select what type of services to provide to each specific invested venture. Different ventures in the same CVC's portfolio may require different services, and thus the CVC may act as an Enabler for some of them, while for others, as an Observer. It becomes even more true when the portfolio's dimension start increasing (Gutmann et al., 2019)

Rossi et al. (2019) classify CVC programs according to their Entrepreneurial Intensity (EI) (Morris, 1998) and Innovation Approach. EI describes the degree and the amount of entrepreneurship within a given organisation (Morris, 1998), in order words, the corporate involvement in its relationship with the startups. On the other side, the Innovation Approach that the authors refer to is the degree of exploitation/exploration (March, 1991). These two approaches are usually considered a trade-off, but some researchers have changed their minds concerning CVCs (Gibson and Birkinshaw, 2004), supporting a potential interaction between the two, namely, the paradoxical ambidexterity. Ambidexterity has been defined as the "behavioural capacity to simultaneously demonstrate alignment and adaptability across an entire business unit" (Gibson and Birkinshaw, 2004), i.e., the capacity to exploit the current opportunities and explore for new ones.

According to the two variables, the authors identify three typologies of CVCs: i) hybrid: they have a medium level of EI, but they may select either exploitation or exploration. Hybrid CVCs may either pursue financial or strategic goals. Sometimes they may decide on both. Thus, they usually adopt a tactical perspective to innovation by promoting the company's development or spinning-off to acquire new capabilities or scouting new financial opportunities ii) dis-ambidextrous: they are characterised by a low level of EI and usually pursue financial objectives. They manage financial activities, and their final objectives are realising financial returns and generating positive cash flow. This approach does not bring any technological improvement, but it can be costly as this type of CVC usually tends to fail (Rossi et al., 2019); iii) Ambidextrous: the EI is high, and the CVCs have a strong strategic commitment aiming at achieving both exploration and exploitation. Their aim at acquiring controls rights in startups and then consolidating them within the company's current initiatives. Ambidextrous CVCs aim at both building a structured form of cooperation and tactically exploring new opportunities.

Although the classifications are different, they share some basic features that allow professionals to orient themselves whilst studying a CVC unit. The four main variables necessary to look for to determine the governance of CVC activities (Dushnitsky, 2011) are four:

- i) Program's structure (Dushnitsky, 2011): it is necessary to understand whether or not the CVC unit is an independent BU or if it is within a BU, and which kind of relationship it has with the parent company
- ii) Level of autonomy (Dushnitsky, 2011) in critical decisions such as fund allocation or investment decisions. It will determine the agility of the venture funds in catching investment/divestment opportunities, agility that is necessary for a fast-changing investment scenario
- iii) The presence and type of KPIs to evaluate the program (Dushnitsky, 2011). They will determine to what extent the corporate is expecting financial versus strategic returns on the investments. The presence of a scorecard can help the interaction between the corporate world and the finance one (Bassen et al., 2006)
- iv) Personnel involved (Rohm and Kuckertz, 2020; Dushnitsky, 2011) and their compensation (Dushnitsky, 2011). First, the compensation will determine whether the corporate will be able to access top investment managers or if they will have to train them. As a direct consequence of the type of managers, the CVC funds will have access to a peculiar set of practices, processes, and communication styles. Indeed, evidence (Dokko and Gaba, 2012) underlines how individuals tend to stick with habits which they are familiar with and transfer them to new contexts. Thus, managers with experience in the investment fund industry will tend to replicate practices and processes carried out within that industry. On the other side, if the employee has a corporate background, she will replicate practices, rules, and processes typical of an established firm.

These four variables represent the main key decisional factors that a corporate should consider when setting up a corporate investment arm to guarantee proper and coherent governance and organisational structure that will ultimately lead to better harness the opportunities coming from the entrepreneurial worlds (Hill and Birinkshaw, 2008).

Are Corporate Venture Capitalists Better at Improving the Portfolio Firms' Performances?
An Analysis of CVCs' Heterogeneity

Authors	Classification Variables	Clusters
Chesbrough (2002)	<ul style="list-style-type: none"> i) Link between operational capabilities ii) Corporate Investment Objectives 	<ul style="list-style-type: none"> i) Emergents ii) Drivings iii) Enabling iv) Passive Investment
Zu Knyphausen-Aufseß (2010)	<ul style="list-style-type: none"> i) Corporate Origin Profile ii) CVC's focus 	<ul style="list-style-type: none"> i) Management Consulting firms CVC ii) Not-tech oriented incumbents CVC iii) Tech Oriented Incumbents CVC iv) Growth-oriented CVC
Rohm et al. (2017)	<ul style="list-style-type: none"> i) CVC motivation ii) CVC self-perception assumption 	<ul style="list-style-type: none"> iii) Strategic CVC iv) Financial CVC v) Analytical CVC vi) Unfocused CVC
Gutmann et al. (2019)	<ul style="list-style-type: none"> i) Degree of value-capturing Services ii) Degree of value-creating Services 	<ul style="list-style-type: none"> iii) Harvester iv) Builder v) Enabler vi) Observers
Rossi et al. (2019)	<ul style="list-style-type: none"> i) Entrepreneurial Intesity ii) Degree of Exploration vs Exploitation 	<ul style="list-style-type: none"> iii) Hybrid iv) Dis-ambidextrous v) Ambidextrous

Tab. n.4 – CVCs' Classification Summary

2.4.4 CVCs Organizational Configurations

The triadic relationship (startup, corporate, and CVC) is a peculiar characteristic of CVC programs and directly affects their governance structure (Weber and Weber, 2011). First of all, concerning the formal relationship with the corporates, CVCs activities can take three different organisational settings (Gompers, 2000), presenting pros and cons. Firstly, the corporate can organise it as an Internal Corporate Venture Group. In this case, the CVC unit will be part of a company Business Unit. The main advantages relate to the tight integration with the firm's specific resources guaranteeing a proper information flow between the entrepreneurs, the CVC units and the corporate. On the other side, this tight relationship limits the CVC managers autonomy in funding allocation and makes their decisions susceptible to the corporate's cash flow availability (Gompers, 2000). To limit this issue, the parent can set up the fund as an Independent BU, with a diverse degree of autonomy but with possible decreasing interaction with the corporate's resources (Gompers, 2000). Thirdly, it can become a Limited Partner in a venture fund. In this case, the cash flow's financial issues disappear as the VC program is not dependent on the corporate's cash flow. On the other hand, the

corporate is not able to provide any specific complementary assets to the entrepreneurs and cannot obtain early access to innovation (Gompers, 2000).

The thesis considers only the first two categories of CVCs.

2.4.4.1 CVC Common Organizational Drawbacks

The debate upon which, among the two macro-categories, i.e., Independent Bus vs Integrated BU, is the best organisational structure is still open. However, both models suffer from three issues that intrinsically connect with the captive nature of CVCs (Gompers and Lerner, 2000; Gompers, 2002):

- i) Not a clear mission and a wide array of objectives - usually not compatible among themselves (Fast, 1978; Siegel, Siegel, and MacMillan, 1998). The desire to pursue at the same time strategic and financial return creates confusion and dissatisfaction in the program. For instance, the CVC managers want to invest in companies that can generate the highest financial return as their compensation is linked to their performance; on the other side the corporate management team is frustrated when CVC fails to invest in technology that may interest them
- ii) Lack of internal cohesion (Gompers, 2002). Many companies start corporate venturing funds without reasoning on how to design it. First, they miss ensuring sufficient commitment to the venturing activities from actors within the corporation (Hardymon, DiNino, and Salter, 1983; Rind, 1981; Sykes, 1990). Even though Top Management strongly supports the initiative, resistance may come from middle management. For example, R&D managers suffer from The Not-Invented-Here syndrome and prefer that the management allocate funds to internal projects; corporate lawyers do not like the program's complexity; other departments' managers may feel threatened by the innovation. Secondly, they do not focus on aligning the venture's unit interests with the corporation ones. For example, venture managers cannot be rewarded solely on financial returns when the corporation prioritise strategic goals
- iii) Lack of proper compensation scheme to CVC managers (Block and Ornati, 1987; Lawler and Drexel, 1980). Corporates have been reluctant to adopt a compensation scheme based on profit-sharing (i.e., carried interests). The first reason for this is related to the administrative problem as employees move from and to the CVC unit, making it difficult to define clear evaluation metrics (Dushnitsky and Shapira,

2010); secondly, the corporate wants to avoid tension for payment inequality among different divisions (Corporate Venturing Directory & Yearbook, 2001)

- iv) Lack of solid external relationships (Gompers, 2002; Hill et al., 2009): in a competitive venture capital market, access to attractive opportunities becomes crucial. Meanwhile, investment opportunities should be made quickly, often with a limited set of information. Thus, close ties can provide favourable access to promising opportunities at an earlier stage than on average; but they can also guarantee professional treatment and access to IVC knowledge (Gompers, 2002). The network becomes paramount, and, thus, it is crucial to building credibility in the eyes of independent investors. These elements can be developed via a clear investment strategy, by creating joint ventures with IVCs or syndicate with those focusing on the same corporate's industry, and via recruitment of talents from investment funds (Gompers, 2002).

2.4.4.2 Endoisomorphism vs Exoisomorphism

The presence of the corporate seems to bring some problems in managing an investment fund. Some structural conditions, such as lack of incentive-based compensation, strategic goals and low expertise in the field, should lead to lower results than for IVCs (Gompers and Lerner, 2000). On the other side, a close relationship with the corporate guarantees to enjoy some benefits related to in-house technical expertise, complementary assets, and lower costs of capital. The corporate and the investment domains are often in contrast, and CVC units have several trade-offs to solve by deciding which of the two to resemble. It is possible to analyse how these two worlds affect the CVCs world by hinging on Mintzberg organisational theory. The corporate world is mechanic, characterised by high specialisation (tasks broken-down in small activities), centralisation (decision power in few individuals), standardisation (processes are well defined), formalisation (written-down processes), and top-down communication. On the other hand, venture capital firms are the opposite. They score low in specialisation, centralisation, standardisation, formalisation, and top-down communication. Scholars have used the isomorphism concept, i.e., the tendency of an organisation to resemble the practice, processes and objectives of a focus entity in the same environment (Di Maggio and Powell, 1983), to classify CVC organisation structure. Isomorphism tendencies generate when a given unit wants to gain legitimacy and guarantee the desirability of its action. CVCs can either strive to resemble the corporate or the VC world. Therefore, they are

endoisomorphs when they adopt a corporate-like organisational structure (Souitaris et al., 2012; Rohm and Kuckertz, 2020), while they are exoisomorphs when they resemble the IVC organisational structure. Four drivers influence the isomorphism tendency that should be carefully analysed to understand which world the CVCs is going to resemble:

- i) TMT management experiences (Souitaris et al., 2012; Dokko and Gabba, 2012; Rohm and Kuckertz, 2020)
- ii) Legitimacy seeking objectives (Souitaris et al., 2012, Rohm and Kuckertz, 2020)
- iii) Structure of the program in terms of governance and goals (Rohm and Kuckertz, 2020)
- iv) Informal (i.e., not-invented-here syndrome, entrepreneurial culture, etc.) and formal (i.e., compensation schemes) structure (Rohm and Kuckertz, 2020).

There is an open debate in the literature about whether the corporate venture fund should resemble the corporate world rather than venture one.

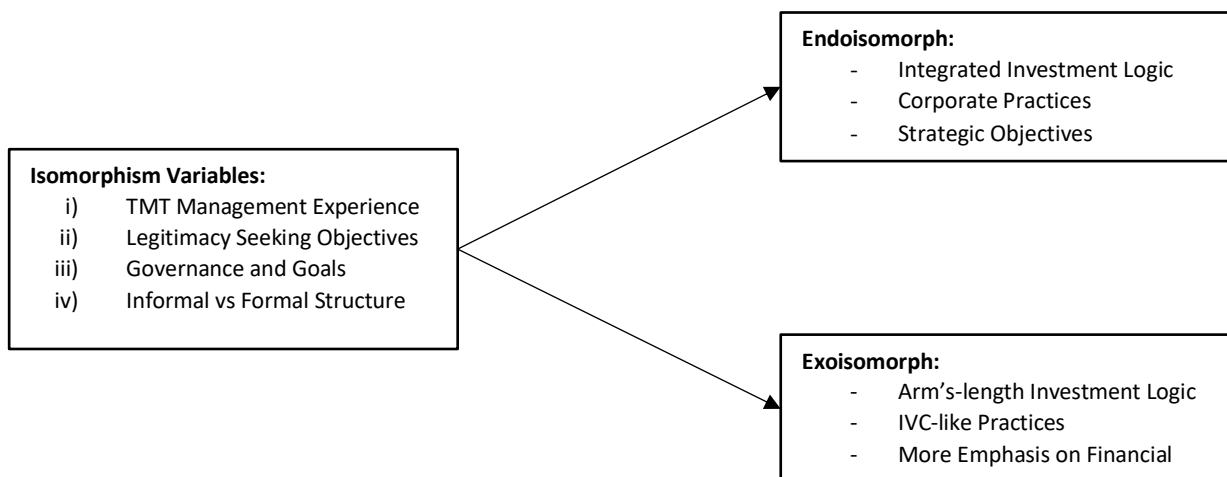


Fig. n.4 - From Souitaris et al., 2012, Isomorphism

Evidence on Exoisomorphism

In their study, Gompers and Lerner (2000) bring out the case of XTV, explaining how they obtained several advantages by organising their CVC unit as a completely independent BU. First, this organisational structure allows a high degree of flexibility and autonomy in the investment decision guaranteeing fast decision making in deal screening and monitoring. As a consequence of higher autonomy, the objectives become focused on obtaining the highest financial return possible, with the strategic ones operating more at a corporate level. Additionally, this makes feasible the adoption of a profit-sharing compensation scheme.

On the other hand, the authors analysed a panel of data showing how the corporate and venture strategic fit leads to higher results. The complementarity transferred by the corporate seems to bring benefits to the investees. However, this exchange of complementarities requires a tight relationship and interaction between the two. Thus, even the authors are surprised how an independent CVC can provide this support effectively.

Dushnitsky and Shapira (2010) approach the debate from a different angle. They claim that the key organisational variable is the compensation-scheme itself. Approaching venture capital investment by a principal-agent theory, compensation will determine the managers' actions and practices, particularly those related to risk management. Indeed, the design of the compensation scheme has the objective to trade risk (managerial perspective) - that may hinder the managers from carrying out specific actions that will benefit the company as a whole - with motivation (principal perspective) that are necessary to provide the right incentives for the managers without providing opportunities for opportunistic behaviour (Levinthal, 1988; Eisenhardt, 1989a). In CVC investment, investors usually manage risk by leveraging on two practices:

- i) Timing of the investment: which stage of the new venture's development the manager is willing to invest in
- ii) Syndication of the investment: whether the investment is carried out by its fund or by syndicating with other venture funds.

The logic behind this is that the higher the compensation scheme, the more prone are the managers to assume risks and expose the corporate to higher returns. Indeed, evidence from Dushnitsky and Shapira (2010) has shown that the incentives-based compensation leads to higher investment in early-stage startups with high growth potential but uncertain product and market (Dushnitsky and Shapira, 2010). For the authors, the combination of corporate resources with venture funds' risk-taking behaviour is a powerful weapon. They demonstrated how corporate funds with high powered compensation schemes are able to obtain higher performances in terms of exit rates even though they invest in early-stage ventures compared to their peers.

Trade-off between Exoisomorphism and Endoisomorphism

However, the study of Yang (2012) does not provide the same support for adopting IVC-like practices. The authors approached the theme by leveraging on the principal-agent and

knowledge-based theories and found a trade-off between Exoisomorphism vs Endoisomorphism.

Yang (2012) supports the thesis that asymmetry in uncertain and opaque environments, like a venture capital fund, are costly to monitor. Thus, outcome-based compensation packages seem to be the solution in this case (Conlon and Parks, 1990). One would expect that managers would be willing to commit resources to ventures and then transfer new knowledge to the parent firm leading to higher performances. However, a high compensation scheme can become a double-edged sword. Incentive schemes signal the principal's objectives but also can influence the agents' actions (Galbraith and Merrill, 1991). Thus, it may be possible that the financial outcome-based compensation would send CVC's managers misleading signals encouraging them to perform to obtain the incentives rather than operate in the corporate interest (Hendry, 2002). It could generate goal conflicts, as the managers are solely pursuing financial goals while forgetting strategic ones. It follows that under VC-like incentive schemes, CVC managers may pay less attention to their strategic mandate and not devote effort to transferring knowledge to the parent. The author suggests that adopting traditional salary-bonus-option incentive schemes would motivate CVC managers to serve the strategic objectives better. The reasons identified are the following ones:

- i) Strategic objectives distinguish for being difficult to measure and to predict objectives; thus, behaviour-based compensation (salary) is more appropriate (Eisenhardt, 1989a)
- ii) Bonuses and options open up the opportunity to connect CVC managers' income with the parent's performances.

These should motivate them to consider long-term strategic benefits; in other words, it is reasonable to assume that they will put more effort in transferring knowledge back from the portfolio companies to the corporate as it represents a crucial contribution to the strategy. On the other side, adopting the traditional incentive scheme may discourage CVC managers from committing themselves to their portfolio companies, especially once the parent company has learned about the new technologies (Alvarez and Barney, 2001). Here starts to emerge the trade-off that the corporates face in defining their organisational structure discussed further in the thesis. Yang (2012) also questioned the effectiveness of high autonomy. On one side, autonomy provides flexibility and speediness in decision making (Gompers and Lerner, 2000) and leads to fewer monitoring costs; on the other side, low

autonomy will reduce the information asymmetries between the corporate and the CVCs managers, but it is costly to implement. Strong information asymmetries in the CVC environment will lead to misalignment in terms of objectives and make corporate performance worst. Conversely, the higher autonomy seems to improve the knowledge transfer from the corporate to the portfolio companies. It underlines once again the trade-off that the corporates face when setting up the CVCs program.

Managing Exoisomorphism and Endoisomorphism

The trade-off between adopting the corporate's or the IVC's practices represents a crucial point for parent companies whilst setting the CVC arms. However, Hill et al., 2009 try to shed some light on the topics by discussing IVC-like organisational structure adoption in the CVC environment.

First of all, the authors are more sceptical on the transferability of the IVC model to the corporate context as the only mean to enhance performances (Brody and Ehrlich, 1998; Chesbrough, 2000; Donahoe, Schefter, and Harding, 2001; Hamel, 1999; Gompers and Lerner, 2000). IVCs and CVCs present an institutional distance between the two as they have different context and environment (Jensen and Szulanski, 2004). Thus, not everything can be easily transferred as-is in the new setting. Only some practices can be applied as-is, but they will solely enhance financial goals. On the other side, other practices adapt to the corporate world and can positively impact on strategic objectives (Jensen and Szulanski, 2004).

The VC model adopted by independent venture funds consists of five main features (Gompers and Lerner, 2000, 2001a; Sahlman, 1990; Zider, 1998) designed to maximise the return on investment, namely:

- i) High-powered financial incentives tackling principal-agent issues between the Limited Partners and the investment managers
- ii) Professional investor's autonomy in investment decisions
- iii) Syndication aimed at sharing risk and expertise with other VC funds
- iv) Contingent staging of investment and value-adding service provision to mitigate moral hazard conflict with the new ventures
- v) Specialisation to address information asymmetries.

Overall, the authors found that the financial performances of the corporate funds are enhanced by the adoption of the following VC model's practices:

- i) Compensation scheme as the corporate faces less moral hazard from the managers leading them to take more risk in the investment activities
- ii) Vertical autonomy: the CVC has decision autonomy on investment targets and can select the most attractive from its point of view
- iii) Syndication activity: the greater the syndication activity, the greater the financial performance. Also, in this case, it is possible to appreciate a risk reduction for the managers that leads them to increase their bets
- iv) Investment in related business: they found an inversely U-Shaped relationship between the relatedness of the corporate's and investees' industry and the financial performances. Investments within a given degree of relatedness lead to results.

Regarding the strategic objectives, VC model practices can lead to better results only if adapted to the new context. The authors found evidence on the following ones:

- i) Horizontal autonomy as autonomy: investment managers should be autonomous from other divisions' managers. Autonomous governance improves the management of the tension and the conflict of interest between CVCs and corporates (Burgelman, 1985; Dougherty, 1995). It should allow the CVC to invest in more speculative opportunities rather than focusing on the short-term performances demand (Simon et al., 1999)
- ii) Interaction with VC firms, e.g., syndication. For strategic CVCs, syndication may be complicated with IVCs as they adopt different practices and objectives (Dushnitsky, 2006). However, other typologies of interaction, such as participating in due diligence or sharing information, have led to positive results. Interacting with the VC community can generate investment opportunities, increase the CVCs expertise (Dushnitsky 2006; Maula, 2007), and provide status as a trustful investor (Keil et al., 2008b)
- iii) Staging investment. It allows reducing the risk and creates options to abandon unsuccessful investment (Gompers, 1996; Guler, 2007; Sahlman, 1990). The investment is pursued only when favourable conditions arise, i.e., when milestones are met (McGrath, 1999), which helps avoid substantial losses (Dixit and Pindyck, 1994).

The authors specify how the strategic-enhancing and the financial-enhancing factors are not in a trade-off with each other. One's application does not come at the others' expense, making both typologies of objectives achievable with different degrees and different mechanisms (Hill et al., 2009).

However, the final judge of the CVCs is the funds' performance. Performances partially mediate the relationship between the VC model and the CVCs survival: corporate investment funds need to deliver positive results to survive. Thus, adopting the IVC practices should be done considering all the factors and related consequences mentioned above. It becomes crucial to define at the top level what the CVCs' aims. Otherwise, the corporate risks having misalignments between strategy and operation. In other words, it is necessary to look for a fit between the IVC model and the specific corporate context.

Chapter 3

Why Corporates Need Corporate Venturing

In the last twenty years, the whole market has been overwhelmed by a new technological innovation wave, mainly characterised by IT, digital technologies and AI.

Concerning IT technologies, their development surprised and pleased visionary leaders that leveraged on their peculiar characteristic theorised by the so-called Moore's Law as exponentiality. The new technologies were able to improve rapidly over time, constantly generating new changes and increasing firms' innovation rate. On the other side, exponentiality has introduced new challenges for the twenty-first-century corporations that all of a sudden have had to cope with an unprecedented R&D competition and a shortening product life cycle (Fulghieri and Sevilir, 2009). Christensen (1997) was the first to theorise the potential threat for incumbent firms, with his two masterpieces: *The Innovators' Dilemma* and *The Innovator's Solution*. More precisely, after having analysed the development patterns of new generation technologies, the author introduced the concept of disruptive innovation. Christensen found out that new technological products start competing in the low-end market and are able to serve just a small market niche, but, over time, thanks to exponential technological advancement, the product gets better and better at a faster pace and can meet the needs of the mainstream customers quickly. When this happens, disruption occurs: the new product having a lower price point, as it comes from a lower-end market, has a better value-cost trade-off for customers, i.e., same needs served with a far lower price, which immediately shift the purchasing behaviour. In the early '90, when the phenomenon increased, corporates were not able to cope with it. Christensen identified two main reasons for this inertia:

- i) Difficulties in recognising technologies starting in unattractive market segments as they generally generate low margin or are far from their current domains

- ii) Difficulties in rapidly retaliating against new ventures. Corporates' value network, i.e., suppliers, cost structure, distribution channels, constrains them to maintain their operational model.

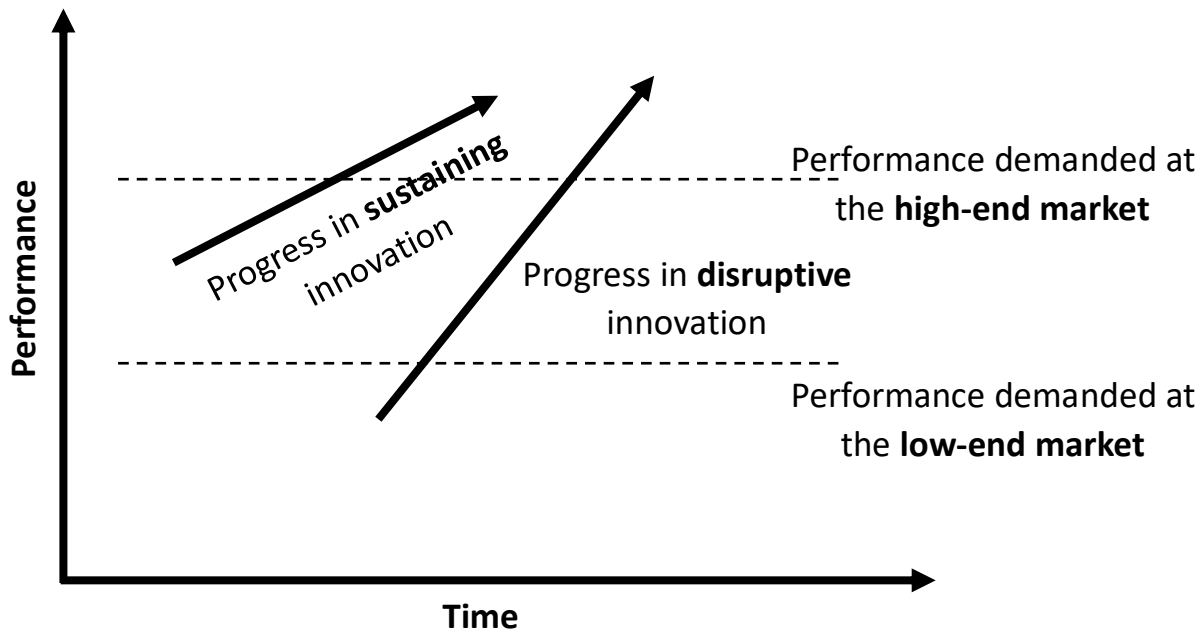


Fig. n.5 - Christensen (1997), Disruptive Innovation

The issues related to disruption were brought to the extreme by the advent of digital technologies. New digital technologies have some peculiar characteristics that completely change the dynamic of product development, namely:

- i) Near zero marginal cost that allows unprecedented scale and guarantees rapid diffusion
- ii) Exponentiality, i.e., thanks to the low cost of experimentation, products can dramatically improve in a shorter and shorter amount of time
- iii) Combinatorial capabilities, i.e., each innovation is a building block for more innovation, and each user can bring value thanks to network externalities and user-generated contents.

These elements, combined with the declining cost of information, allow the product to follow a completely different adoption curve than the one introduced by Rogers. New digital products can reach mainstream customers in weeks without passing through early adopters. Downes and Nunes (2016) were the first to theorise this phenomenon and coined the term "Big Bang Disruption". Indeed, similarly to the big bang, digital products explode and become mass-adopted in a short time, modelling the gaussian adoption curve into a "Shark Pin".

Many incumbents fell under technological disruption, such as digital camera producers (e.g., Canon, Kodak) that were swept out by the introduction of the smartphone in a matter of months.

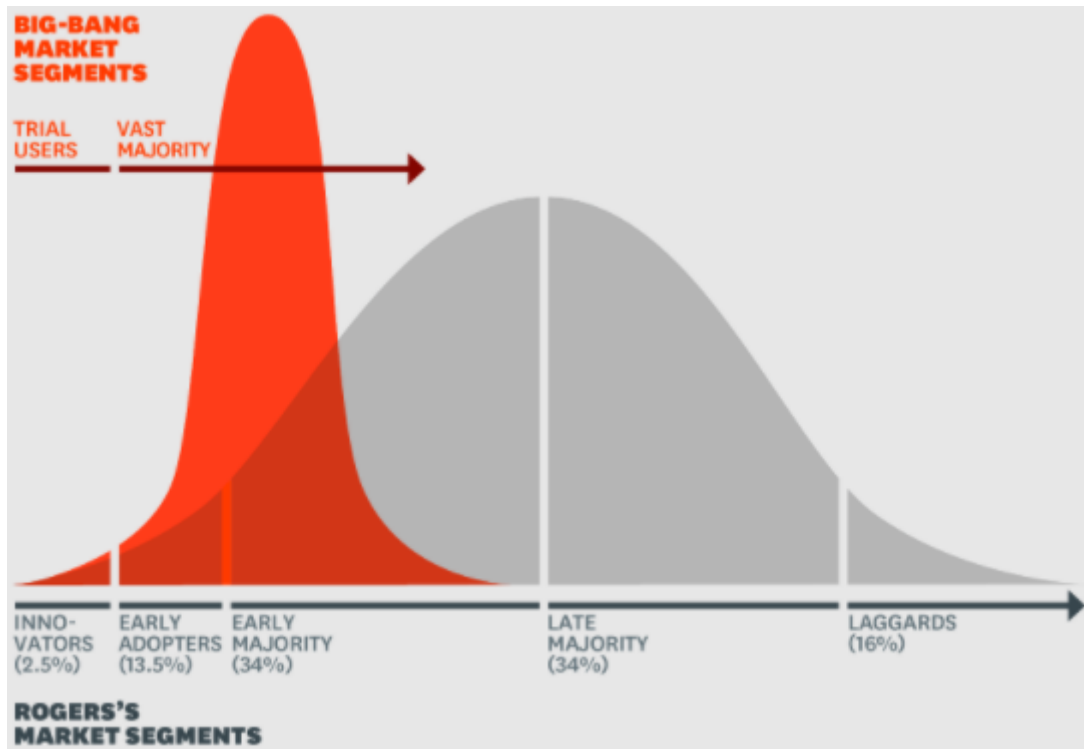
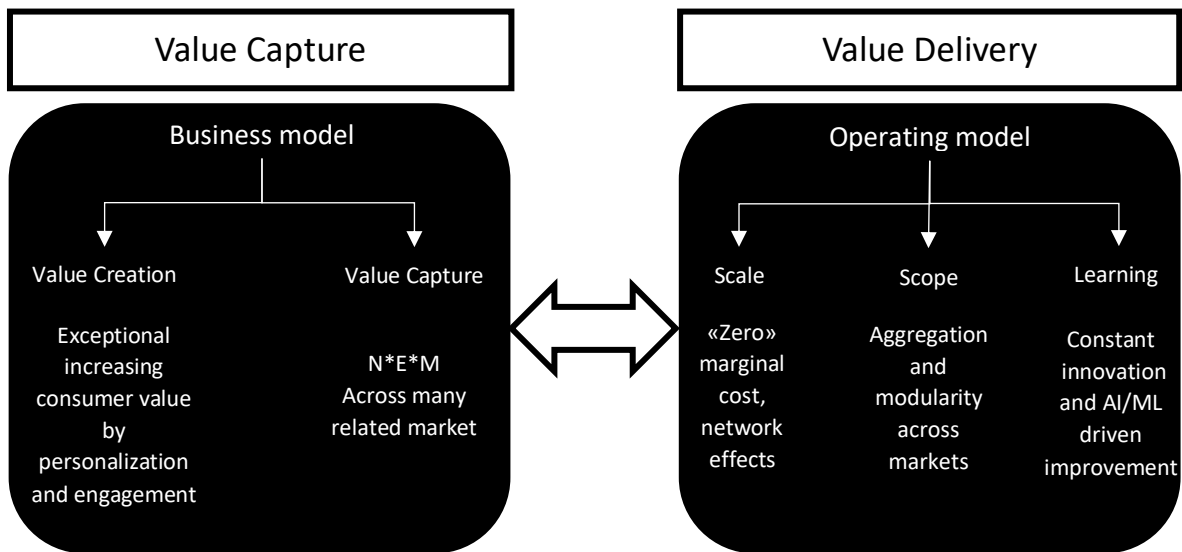


Fig. n.6 – Downes and Nunes (2016), Big Bang Disruption

Lastly, in the last years, corporates have been coping with the surge of AI. If digital technologies could provide unprecedented scale, AI can provide unprecedented scope and learning by drastically changing the operating model of corporations (Iansiti and Lakhani, 2020). A new breed of companies, not products, is growing to compete and obtain a sustainable competitive advantage in different industries altogether. In other words, AI-enabled firms can manage wider value-creating and capturing initiatives without increasing the complexity of value delivery activities thanks to automation. It follows that competition can now come from different markets and firms who have their core in other distant businesses. To cope with the fourth AI-wave, firms have to completely change their organisational paradigm by breaking down siloes, digitising processes, and strategically sourcing and deploying data. These infrastructural changes are needed to embed AI in operations and adopt an ecosystem point of view.



Note: $N * E * M$ = (the number of users) * (user engagement) * (monetization)

Fig. 7 - Iansiti and Lakhani (2020), Competing in the Age of AI

Innovation is continuously challenging corporations and, in such a complex world, the desire to harness it is growing.

3.1.1 Innovation has become a must-have

Innovation, i.e., the creation and commercialisation of technological knowledge, usually in the form of new products and performances, is the key for firms to sustain economic performances (Roberts, 1999) and survival (Cefis and Marsili, 2005). The technological changes of the last twenty years have led corporates to realise that new approaches to innovation were necessary in order to maximise the return on investment in R&D activities. The certainties of obtaining the monopoly "on the next big thing" has decreased over time (Dushnitsky, 2011), and it became necessary to engage more often in collaborative, inter-organisational knowledge sharing relationship (Hagedoorn, 2002) to improve innovation performances (Hagerdorn and Narula, 1996). The Open Innovation paradigm is born. This approach proposed by Chesbrough represents the cornerstone of the modern innovation processes. The model promotes the interactions between established players and new ventures to search for new distant technologies, products, and services, and therefore sense disruption. The number of domains that a company should manage to deliver its products has

been increasing due to industry convergence guided by digital and AI technologies. The solution to cope with complexity is adopting an ecosystem approach where different players interact to integrate services and new products within their offering (Dushnitsky, 2011). Corporate Venturing Activities represented an attractive and efficient configuration to scan, monitor, and then engage with new and disruptive startups. Indeed, it helps to gain insights on fast-changing industries that are too distant from the corporate to be detected, but it is also a powerful tool to foster the organisation's innovation culture. It has proved to overcome the internal inertia (NHI and NSH syndrome) that may hinder entrepreneurial initiative thanks to their arm's length configuration (See Chap 2). Not surprisingly, the setup of corporate venturing activities has been increasing in the last decade, with some corporate venture capitalists becoming established players within the venture capital market.

3.1.2 CVCs are here to stay: the solution to cope with disruption

In the last 20 years, CVC-initiatives' widespread adoption has led the so-called fourth wave to start. For the first time in history, scholars and practitioners recognise a different corporate approach to venture capital initiatives. Compared to the previous waves, CVCs seem to be longer and more stable and have a well-defined strategy (Dushnitsky, 2011). It may signal that the new programs are set up to stay and not act like "tourists" as in the past (Vidra, 2019), but also that CVC is finally gaining credibility as a new path to tap into innovation, either by developing others' inventions or letting others develop unused ideas languishing within the firm (Gompers and Lerner, 2000; Yang, 2012).

It is necessary to introduce the concept of ambidexterity to understand why CVCs are becoming so fundamental. In order to cope with disruption innovation, corporates need a high level of dynamic capabilities, i.e., the ability to change and adapt quickly to new market conditions, and ambidexterity has proved to be one of the most effective ways to do so (Denford, 2013; O'Reilly and Tushman, 2011). Ambidexterity means capitalising on existing resources and, in the meanwhile, developing new combinations of resources to meet future demands' needs (Gibson and Birkinshaw, 2004; Tushman and O'Reilly, 1996). More precisely, it is the capability to simultaneously exploit and explore to adapt the organisation to tomorrow's changing environment (Guisado-Gonzales et al., 2017; Jansen et al., 2005). On one side, the corporate is able to compete in markets where efficiency in processes and controls

are crucial; on the other, it can compete in a new market where flexibility and experimentation are needed (O'Reilly and Tushman, 2013). Structural ambidexterity is necessary to allow the two souls to coexist, and Corporate Venture units are the most adopted instruments to achieve it (Hill and Birkinshaw, 2014). More precisely, CVCs are crucial for exploration activities as they enhance the scouting capabilities by identifying prominent startups, i.e., technological opportunities with growth options (Acs and Audretsch, 1988; Burgelman, 1983; Dushnitsky and Lenox, 2006; Wadhwa and Kotha, 2006). Thus, CVCs are the gears that allow corporates to achieve adaptability and alignment within their organisations simultaneously (Gibson and Birkinshaw, 2004).

3.1.3 CVC and corporate goals

CVC's parents usually decide to open corporate venturing programs to achieve both financial and strategic goals (Dushnitsky, 2006). Concerning the former, being investment funds, CVCs look for obtaining decent capital gains via exit events, i.e., IPO or acquisitions. However, what is peculiar and critical for the corporate are the strategic purposes of the funds. The strategic goals are diverse and complex (Park and Steensma, 2013). They can help the exploitation phase as well as the exploration phase. Concerning the former, CVCs may help to find new suppliers and buyers or new partners to expand internationally (Winters and Murfin, 1988). Parents may even support the commercialisation of complementary technologies that indirectly stimulate the demand for their current offering (Kann, 2002; Chesbrough, 2002). Concerning the exploration benefits, the CVCs programs, as previously introduced, are the perfect instrument to detect new technologies, products, or services that may have the potential to:

- i) Replace their current offerings (Kann, 2002; Keil, Zahra, and Maula, 2004; Dushnitsky, 2006)
- ii) Accelerate the entry in new markets (Kann, 2002; Keil, Zahra, and Maula, 2004; Dushnitsky, 2006)
- iii) Complement their R&D activities (Mason and Rohner, 2002).

Overall, the literature seems to agree that strategic objectives are more important than financial ones (Dushnitsky, 2006). Evidence showed how the most value-creating CVC investments are carried out by corporates investing in startups to realise strategic benefits

rather than mere financial results (Gompers and Lerner, 2000; Dushnitsky and Lenox, 2006; Yost and Devlin, 1993).

The parent can consider new ventures' technologies as either competing or complementary. It is possible to talk about complementary technologies when their development positively impacts on the corporate's asset value, i.e., startups' commercial success increases the CVC's parent earning. Competing startups, conversely, will have a negative strategic impact on the parent's assets value. In both cases, creating an equity tie relationship guarantees the CVC the capability to exert control over the technology by speeding or blocking it up (Helft, 2006; Wadhwa and Kotha, 2006; Hoyem and Huston, 2007). CVCs nurture the development of complementary technologies but can also obtain access and steer competing technologies (Mark Heesen from NVCA). In addition, empirical evidence confirms the parents' interest in the technology by showing how CVC investments are usually an intermediary step that precedes those ventures' acquisition (Siegel et al., 1988; McNally, 1997; Benson and Ziedonis, 2009).

3.1.4 CVC as an organisational learning tool

This last decade's short innovation cycle directly connected with the increasing speed of new knowledge generation making firms unable to solely rely on their internal knowledge stack to win over competition (Yang, 2012). Analysing CVCs from an inter-organisational learning perspective, CVCs have become a tool to tap into rare and hard-to-imitate knowledge across organisational boundaries, allowing corporates to overcome their strategic inertia and innovate rapidly (Dushnitsky and Lenox, 2005a) and maintain a sustainable competitive advantage (Barney, 1991). More precisely, even though innovation requires the combination of different knowledge (Arrow, 1974), established players tend to search local and close domains, i.e., those within their existing knowledge stocks (Levinthal and March, 1993). This learning myopia limits firms' ability to explore new areas (Levinthal and March, 1993) and, as a consequence, generates difficulties in creating innovation (Henderson, 1993; Tushman and Anderson, 1986) by slowing down the corporate's R&D activities (Dushnitsky and Lenox, 2005a). A valid alternative to overcome internal limits (Cohen and Levinthal, 1990) is represented by learning through external knowledge sources, such as:

- i) Regional network of employees and firms (Almeda and Kogut, 1999; Saxenia, 1990)

- ii) Laboratories financed by universities or governments (Cohen et al., 2002)
- iii) Alliances (e.g., Schildt et al., 2005)
- iv) Acquisition (Ahuja and Katila, 2001; Schildt et al., 2005)
- v) Entrepreneurial ventures (Kortum and Lerner, 2002).

Among these, entrepreneurial ventures have been increasingly considered one of the most valuable sources of learning opportunities (Shane, 2001; Gans and Stern, 2003; Poser, 2003), determining the soaring of corporate venturing initiatives. The creation of an equity tie with new firms via CVCs represents for the corporate an authorised access to technologies and practices (Chesbrough and Tucci, 2003) whilst increasing the likelihood of creating breakthrough innovation (Ahuja and Katila, 2001).

The learning opportunities arise in three distinct central moments. Firstly, before the investment, i.e., when the corporate investors carry out the due diligence procedure. It is an excellent opportunity to learn about the management team, business plan, market, product, and technology (Dushnitsky, 2006). Indeed, R&D managers, who usually are involved in evaluating the technology and the product (Dushnitsky, 2006), can start establishing a relationship with the startups' personnel and thus open the window on continuous information exchange (Basu et al., 2011).

Secondly, over the investment period, corporate investors generally obtain board seat or board observer rights. The CVC appoint R&D personnel or BUs managers to these monitoring roles, and they act as information conduits by providing the corporate with information on strategy and technology. Besides, corporate investors usually hold frequent meetings with portfolio firms intending to evaluate their KPIs, including technological development. As the relationship develops, social interactions between the parties increase, leading to a mutually beneficial inter-organisational learning (Maula et al., 2009; Basu et al., 2011).

Thirdly, failing ventures have an information weight, and CVCs may learn from them (McGrath, 1999). The corporate can sense via the startup's experience which types of technologies or products attract the markets and obtain additional insights on customers preferences (Gompers and Lerner, 2000; Maula et al., 2003b; Dushnitsky and Lenox, 2005b; Ivanov and Masulis, 2008).

3.1.5 Contingency Effect for External Knowledge Acquisition: Acquisitions vs CVC Investments

The means through which firms can collect knowledge from outside players vary and span from CVCs initiatives, alliances, joint venture, or acquisition (Roberts and Berry, 1985; Keil, 2002). Among these, acquisitions and CVC initiatives represent the two alternative governance modes (van de Vrande et al., 2006), opening to entirely different outcomes (Schildt et al., 2005; Keil et al., 2008a). Therefore, a focal corporate has to evaluate what path to follow by adopting real-options logic carefully.

Venture capital investments can be considered as a valuable real option thanks to the flexibility they provide investors with in managing high-risk investment (e.g., Hurry et al., 1992; Trantis, 2001; Cossin et al., 2002; Li, 2008). In other words, a high level of uncertainty about business models and markets characterises new ventures, and, therefore, they are considered a risky investment class. On the other hand, they are a considerable investment opportunity that is difficult to let go. CVCs could be the proper means to exploit the value-risk trade-off thanks to their option-like investment approach (e.g., MacMillan et al., 2008). First of all, CVCs usually adopt staged financing, which gives them the possibility to invest only after accomplishing specific milestones. This practice allows to cope with uncertainty: corporate investors have the right but not the obligation to make the subsequent investments and increase the level of resources committed. On the other side, staged financing is reasonable from a financial side point of view. The value of the project is not related to the immediate cash inflow provided, but to future discretionary investment opportunities (Amran and Kulatika, 1998; Triantis, 2001), i.e., an investment generates a cascade effect leading to new investment that can unlock the growth potential (Hurry et al., 1992; Chesborough, 2002). Such value also materialises by introducing cash flow rights in the form of convertible securities, which open up the CVC to the opportunity of becoming owners of a considerable share part if the investment goes as planned (Cornelli and Yosha, 2003). The staging practices can also limit the downside risk by not immediately deploying the resources, which the corporate can redirect to other promising projects (Sahlman, 1990). Besides, CVCs liquidation clauses and redemption rights ensure abandonment (Sahlman, 1990; Trigeorgis, 1996; Kaplan and Stromberg, 2003). If the uncertainty remains, the corporate has the option to defer the invest-or-leave choice and buy more time before deciding. These clauses are especially valuable as high-tech ventures can be considered "time-to-build" projects (Trigeorgis, 1996).

Conversely, acquisitions are less flexible and thus entails limited real options. First of all, acquisitions require a more substantial commitment and low deferral option (Folta, 1998;

Dyer et al., 2004). Secondly, they are one-time operations, with few opportunities for conditional follow-up operations. Lastly, the divestment option is a more complicated way as it involves divesting an entire company rather than an equity stake. Thus, the abandonment option is still possible here, but it becomes more difficult or less likely (Berger et al., 1996).

It is reasonable to assume that when a high level of uncertainty around product offering and market surrounds prospectus startups, corporates are more prone to opt for a CVC investment rather than an acquisition (Tong and Li, 2011). Considering that the real option value increases with uncertainty - especially if the latter is exogenous to the investment, CVC investments are more valuable and highly unpredictable and dependant on external factors such as the product and market (Dixit and Pindyck, 1994; Trigeorgis, 1996). On the other side, by deferring the new ventures' internalisation, the firm limits the exposure to downside risks in the hypothesis that the startup's performances will not follow the desired course of action (Balakrishnan and Wernerfelt, 1986; Folta, 1998).

It is worth noting that the level of irreversibility and growth of the targeted startups mediate the uncertainty's effect. Reversibility will provide flexibility in the investment decision regardless of the uncertainty and help to contain the downside effect connected with undesired future outcomes (Dixit and Pindyck, 1994). Indeed, as irreversibility decreases, the resale value increases and thus, the decision will become less sensitive to the uncertainty level (Dixit, 1989; Pindyck, 1990). It follows that the corporates' preferences for CVC investments increase under high irreversibility and decrease in the opposite case (Tong and Li, 2011). Concerning the potential growth of the investment target, it is important to underline that waiting can entail huge opportunity costs in case of high growth. Indecision, indeed, leads to loss of potential profit both in the present and future times (Kulatilaka and Perotti, 1998). Besides, the upside potential, decreasing over time, offsets the downside protection of delaying the investments (Dixit and Pindyck, 1994). It follows that corporates are more prone to embark on CVC investments when the growth rate is relatively low, while they may be more willing to acquire the potential target when the estimated growth is higher (Tong and Li, 2011)

3.2 Determinant in Opening a CVC Fund

It is necessary to investigate different theoretical points of view in the literature to understand why some corporates embark on a CVC journey and others delay in the endeavour. The resource-based view represents a good starting point (Barney, 1991; Wernerfelt, 1984).

3.2.1 Resources-based view and the Opening of a CVC Fund

The competitive advantage is strictly related to its set of resources and simultaneously correlates with innovation (Ferreira, 2010). More precisely, the possession of specific resources supports innovation-related activities more than others (Brown and Eisenhardt, 1997; Henderson and Clark, 1994; Iansiti and Clark, 1994; Leonard-Barton, 1995). Thus, it is reasonable to assume that corporates with specific skills and knowledge are more likely to invest in CVCs as they are more capable of selecting the best method to generate value via startup investments. Besides, the availability of specific resources is an important asset for corporations in competing in the venture capital market. The presence of unique resources guarantees to stand-out among the crowd and attract startups that need their complementary assets to grow. Thus, it is likely that corporations possessing these resources are more willing to start this journey (Basu et al., 2011). Lastly, CVCs activities are resource-intensive, and they are highly dependent on the ability to mobilise excess resources. Indeed, for the slack-resources theory, extra resources are crucial in the innovation process (Cyert and March, 1963; Zajac et al., 1991; Zaltman et al., 1973), encouraging strategic decisions oriented to change and risk-taking. Corporates that dispose of a stack of unused resources are usually more willing to invest in innovation via CVCs. However, not all the slack resources increase the likelihood of starting a CVC arm (Brinette and Khemiri, 2019). Basu et al. (2011) tackled the issue and investigated if some resources are positively correlated to an increase in CVC activities. Their analysis considered whether either technical or marketing resources would increase the corporate investment level and found interesting results.

Concerning the technological resources, it is worth noting that startups are attracted by established firms with deep technological expertise (Ahuja, 2000), especially if they have an extensive knowledge stock in terms of patents as it signals their willingness to commit to R&D investments (Stuart et al., 1999). Access to technological resources is highly valuable to startups because they usually develop their core technologies in later stages due to a lack of resources such as personnel or equipment (Mitchell and Singh, 1992). On the corporate side,

technological resources enhance the "absorptive capacity" for detecting, evaluating, and assimilating external knowledge (Cohen and Levinthal, 1990). More precisely, corporates with deep tech-related expertise are able to evaluate the new ventures' knowledge (Sykes, 1986), how to extract value via cooperation (Gans and Stern, 2003) and provide the right complementary technologies to increase the new venture's value (McGrath, 1997). Thus, as Basu et al. (2011) proved, all these elements increase the corporate's CVCs intensity.

The marketing resources are usually correlated with solid branding and positive reputations (Srinivasa et al., 2005). It follows that brand and reputation improve the corporate's attractiveness to potential new ventures willing to obtain a stamp of approval. Well-established corporates endorsement acts as a signal of the new ventures' quality to interested third parties, which usually lack information about them (Ernst et al., 2005; Stuart et al., 1999). Also, startups usually present many marketing deficiencies. Corporate investors with strong marketing resources are attractive partners that can help them successfully commercialise their products and services (Teece, 1986) and develop marketing capabilities (Kelly et al., 2000). Besides, established firms with substantial marketing capabilities can detect the best commercialisation strategy for new ventures (Keil, 2004), increasing the startups chance of success. Corporates can provide insights into the market, customer needs, promotional expertise, and distribution channels (Penrose, 1959). Therefore, it is reasonable to assume that parents with more excellent marketing capabilities are more prone to set up a CVC unit. Basu et al. (2011) confirmed these assumptions by providing evidence on how marketing resources are positively related to the CVC intensity.

In another study, Brinette and Khemire (2019) investigated the role played by slack financial resources (Cyert and March, 1963; Daniel et al., 2004) and, by assuming that firms with good financial results are more risk-tolerant than others, proved that two are the main indicators influencing the opening of a venturing arm:

- i) Free cash flow. It can generate agency issue between managers and shareholders. In the absence of good investment opportunities, managers invest excess free cash flow in a non-valuable project at the shareholders' expense. CVC strategy should limit this behaviour by providing them with investment opportunities. Thus, corporates with high cash flow are more prone to invest in corporate venturing initiatives that limit the waste of money in useless projects (Brinette and Khemiri, 2019).

- ii) Debt. It can be another tool to discipline management and reduce free cash flow. The debt level can influence the company's financial flexibility and thus hinder the innovation aspirations via the CVCs program (Brinette and Khemiri, 2019).

Overall, the evidence demonstrated that firms with good accounting-based performances, rather than market base KPIs, are more likely to open a CVC unit as they are more capable of managing the potential cost increases (Brinette and Khemiri, 2019)

3.2.2 Environmental Characteristics and CVC decision

It is reasonable to assume that firms' decision to undertake CVC programs could be strictly related to the external environment. More precisely, environmental conditions, combined with firms' resources, influence both the corporate's inducement and opportunities to invest (Sakakibara, 2002), i.e., impact the opportunity-cost evaluation determining the level of the CVCs' activities. Particularly dynamic industries change rapidly and unpredictably (Dess and Beard, 1984; Eisenhardt, 1989b), leading to low mobility and entry barriers, thus eroding possible competitive advantages (Bettis & Hitt, 1995; Dess & Beard, 1984; Volberda, 1996; D'Aveni, 1994). It obliges companies to adapt themselves via exploring and developing new resources to modify their positioning and regain a competitive advantage (Eisenhardt and Martin, 2000). In such an environment, flexibility is crucial (Ghemawat and Costa, 1993; Voldbera, 1996), while early irreversible commitment can lead to sub-optimal outcomes (Levitt and March, 1988). In this setting, CVC represents the more flexible financing mode for innovation and, for this reason, is the most adopted in this environment.

In order to understand how the environmental characteristics shape the decision of opening CVC arms, it is worth analysing the three characterising highly dynamic environments, namely:

- i) Industry competitive intensity, i.e., an industry's competitive structure (Volberda, 1996)
- ii) Technological change, i.e., the innovation intensity within an industry (Dess and Bear, 1984)
- iii) Industry appropriability, i.e., to what extent technologies can be protected (Bettis and Hitt, 1995)

Concerning the first point, high competition is associated with low margin threatening incumbents' survival (Barnett, 1997). It is reasonable to assume that corporations will activate

innovation to achieve a transient competitive advantage (D'Aveni, 1994) by building new resources in order to improve their position (Geroski, 1990) or introducing new complementary products to stimulate demand and lock-in customers (Garud and Kumaraswamy, 1993). Firms in competitive industries experience a higher level of incentives to modify their positioning to compete more effectively (Porter, 1997). They are more prone to adopt flexible modes of organising (Ilinitch et al., 1998; Volberda, 1996) and pursue exploratory innovation activities (March and Shapira, 1992). CVCs are the perfect means of exploration and flexibility as firms can easily access various novel technologies from different entrepreneurial ventures and avoid committing resources in R&D products (Dushnitsky and Lenox, 2005b). Besides, corporate venturing can improve the strategic positioning by increasing the likelihood of developing complementary products and allowing them to differentiate from the industry (Kann, 2002) and develop organisation efficiency (Dushnitsky, 2006). Indeed, Basu et al. (2011) proved these hypotheses by showing how competitive intensity positively correlates to the incumbents' intensity level of CVC activities.

Regarding technological change, the rapid innovation cycle renders products and technologies obsolete (Qualls et al., 1981), forcing companies to continuously develop new resources to improve their value proposition (Eisenhardt and Martin, 2000). The uncertainty related to the new innovation cycle exacerbates the challenge of constantly developing new resources, as it is hardly impossible to predict ex-ante which of them to commit to in order to provide value to customers (Brown and Eisenhardt, 1997). For this reason, incumbents tend to prefer flexible approaches to cope with these cases (Steensma and Corley, 2000). Thus, CVCs, which offer the possibility to develop new products via interfirm equity ties, represent a valuable option. Indeed, they allow the parent to assimilate disruptive technology to build new products or enter a new market (Maula et al., 2003b) while optimising R&D expenditure (Kann, 2002). For this reason, evidence has proved that CVCs intensity level and industry technological changes are positively correlated (Basu et al., 2011).

Lastly, industry appropriability, i.e., the extent to which the company can protect the knowledge stack produced from misappropriation risk (Teece, 1986), is directly dependant on formal Intellectual Property Rights (IPR), e.g., patents and trademarks, which are considered a crucial means to protect innovation-related knowledge from imitation (Teece, 1986). Considering that appropriability regimes vary between industries (Levin et al., 1987), it reasonable to assume that weak-IPR industries experience a higher innovation rate due to

technological spillover (Klevorick et al., 1995). It follows that incumbents in these market spaces must innovate continuously to maintain their competitive advantages (Roberts, 1999). It requires adopting flexible and exploratory modes to organise activities (Ghemawat and Costa, 1993), making the CVCs investment ideal for innovating. On the other hand, startups may be unwilling to enter in an equity tie under weak IPR regimes due to the high misappropriation risks (e.g., Katila et al., 2008). The corporate can offset misappropriation by leveraging on learning strategic appropriability mechanisms (Cassiman and Veugelers, 2006), such as tempting the new ventures with complementary assets (Gans and Stern, 2003) or offering secrecy agreements (Merkham et al., 2005). Staged financing (Gompers and Lerner, 1995) and lawsuit threat (Basu et al., 2011) are also a threat to induce the ventures to share not-formally-protected knowledge. For these reasons, Basu et al. (2011) proved that a strong IPR regime leads to a lower level of the CVCs activities from the corporate side.

3.2.3 The role of R&D in the Opening of CVC units

In the last 20 years, CVCs units have become recognised as a means for externalising R&D investments as they allow to gather information on novel technologies while deferring the commitment of resources until the uncertainty around them is reduced (Gaba and Bhattacharya, 2012). CVC units offer both exploratory and exploitative benefits to the firms (Basu et al., 2011). Exploration in terms of insights on new markets, technologies and business models via portfolio ventures (Benson and Ziedonis, 2009). Exploitation includes access to complementary technologies (Dushnitsky, 2006) and enters new markets through startups (Chesbrough, 2003). However, CVCs can be risky. Benefits occur when knowledge, technologies, or products from the portfolio firms are integrated by the corporate. Their assimilation is challenging as the R&D personnel has to overcome the "not-invented-here syndrome" (NIH), i.e., the rejection of outside of the boundaries' knowledge sources. The corporate has to make massive investment to change R&D's routines and processes (Chesbrough, 2006). Therefore, R&D and CVCs are intrinsically connected. In order to fully understand the decision of opening a corporate venturing arm, it is worth analysing whether the corporate is likely to set up a CVC unit according to the internal R&D innovation rate (Gaba and Bhattacharya, 2012). Gaba and Bhattacharya (2012) shed light on the issue by adopting a behavioural theory perspective.

A corporate may rely on external R&D when it faces difficulties generating innovation internally (Desyllas and Hughes, 2008; Vermeulen and Barkema, 2001) as they do not meet the aspirations for the desired performances. In this case, the causes are easily identifiable in the innovation managers. On the other side, it is reasonable to assume that firms may believe that the efforts carried out internally are enough to sustain their competitive advantages when the performances meet the expectation. Indeed, they tend to consider their R&D capabilities as the cornerstone for their technological competitiveness, and it would be counterintuitive to move resources from there to set up the CVC unit when they are obtaining the desired results. Thus, it is possible to assume an inversely proportional relationship between R&D performances and CVC unit adoption likelihood. Unluckily, evidence (Gaba and Bhattacharya, 2012) provides mixed results. Innovation performances well above the aspirations meet top managers expectations and, thus, the probability of adopting CVC units decrease. However, due to the change management efforts required, the opposite does not hold. Innovation performances below the aspirations do not increase the likelihood of adopting a CVC unit. It underlines the decision's complexity from a behavioural perspective: the adoption barriers can block the corporate venturing programs' setup and limit change (Staw et al., 1981).

R&D and Absorptive Capacity

High flexibility compared to internal R&D investments, characterises CVC investments. CVCs provide means to speed up the innovation process by spreading investment between different startups and accessing multiple innovations. Spreading investment reduces the overall risks for developing their internal capabilities, which is a helpful tactic in a highly dynamic environment where technologies and competencies can rapidly become obsolete. Adopting a real-options logic, CVCs represent an opportunity to limit the commitment to R&D investment in new and emerging technology characterised by a higher uncertainty while reserving the right to increase their investment as the market evolves and uncertainty reduces (Basu et al., 2011; Kann, 2002; Maula et al., 2003b) by committing further resources to the most attractive projects (McGrath and Nerkar, 2004). However, the idea of relying on just one of the two while completely forgetting the other is not entirely correct. More precisely, in high-tech sectors, the CVCs' capacity to understand and evaluate external technology is crucial when evaluating new ventures prospectuses, and industry knowledge obtained via R&D activities can become a crucial asset in evaluating the CVC targets' technologies. In other words, R&D helps develop

the so-called absorptive capacity (Cohen and Levinthal, 1989, 1990; Keil, 2002; Lane et al., 2006) and increases the sensing and forecasting capabilities concerning new trends and the industry's outlook. For this reason, R&D expenditures are strictly correlated to an increase in corporate venture capital activities (Sahaym et al., 2010).

The Mediating role of R&D accordingly to industry condition

The value of the CVCs investments flexibility is directly related to the industry's conditions (Basu et al., 2006; Sakakibara, 2002; Schilling and Steensma, 2001). More precisely, technological uncertainty and munificence can influence the equity-tie formation by providing different pressures, inducements and opportunities (Sakakibara, 2002; Schilling and Steensma, 2001). R&D has proved to play a mediating role between these industry forces and the CVC adoption.

Concerning technological uncertainty, technological change speed varies between industries (Klepper, 1996), leading to different outcomes in terms of disruption in the underlying equilibrium (Schumpeter, 1942). Rapid changes may immediately turn existing capabilities obsolete (Leonard-Barton, 1992), thus, compelling firms to search for new and better technologies in the market (Anderson and Tushman, 1990; Schumpeter, 1942). Emerging technologies development trajectory is highly unpredictable (Arthur, 1988; Henderson and Clark, 1990) in future demand and dominant design (Anderson and Tushman, 1990). Developing a CVCs' investment portfolio acts as a hedge against the risks embedded in uncertainty and a window on multiple technological opportunities (Folta and Miller, 2002; Keil, 2002; Steensma and Corley, 2001). Therefore, in such environments, the development of a solid R&D base is beneficial; indeed, when technologies keep changing, the ability to predict development trajectories is more complicated, and firms have to rely on their internal capabilities to understand, evaluate, and connect with promising new ventures (Kogut and Kulatilaka, 2001). For these reasons, industries characterised by a high level of innovation, i.e., technological change, are experiencing a higher level of CVC activities and where the positive impact of R&D's absorptive capacity is meaningful (Sahaym et al., 2010).

Concerning environmental munificence, the literature has two contrasting opinions. On one side, the CVC activities require a significant commitment of resources in order to be correctly set up (Gompers and Lerner, 2001). Managers in more munificent environments are prone to embark on risks-taking activities, such as setting up a CVC unit, as the pressure on delivering results is lower and the organisational inertia consequently decreases (Aldrich, 1999;

Hambrick and Finkelstein, 1987). Meanwhile, in less munificent environments, managers are focused on the survival of their firms rather than embarking on bold initiatives such as corporate venturing (Castrogiovanni, 1991). On the other side, the second stream believes that the lack of munificence is the leverage that nudges the managers to undertake CVC investments (Cyert and March, 1992). In this space, the pressure to innovate is higher, and a natural strategic choice is to move in a more munificence market space to gain a competitive advantage. Conversely, firms with excess resources are less motivated and usually spend their financial resources less carefully (Nohria and Gulati, 1996). However, evidence (Sahaym et al., 2010) showed a positive mediating role played by environmental munificence in the interaction between the R&D activities' impact and the level of CVC activities. Indeed, in a munificent environment, resources are available for many strategic initiatives, organisational inertia is relatively low, and opportunities are plentiful. Thus, R&D capabilities become the central pillar guiding the exploration activities of the corporate. Leveraging on the developed absorptive capacity, the corporate can better deploy the excess resource more efficiently. In contrast, when the environment is less munificent, the parent's firms shift their focus on short-term resource acquisition, survival, and competition (Aldrich, 1999; Deeds, 2001). Thus, it offsets the potential benefits that R&Ds can generate on CVCs as the interaction between them is usually weaker.

3.3 Theoretical Models to Explain CVC Adoption

Before deep-diving into the empirics behind the pros and cons of adopting CVCs, it is essential to analyse the theoretical rationale underpinning the corporate venturing journey and understand the mechanism leading to venture programs' setup and the expected benefits on the corporate.

3.3.1 Ryanto and Schwienbacher's (2006) Model

The corporate may decide to set up a corporate venture arm for several reasons. First, CVC will increase the corporate's flexibility (Basu et al., 2011; Kann, 2002; Maula et al., 2003b): on the one hand, it could focus on core activities, while on the other, outsource R&D activities. Consequently, the corporate will be able to rapidly respond to new opportunities due to a

limited resources commitment to internal R&D projects (Kann, 2002). Secondly, the corporate will be recognised as a trustworthy partner by the new ventures, mitigating the possible concerns about the misappropriation risks. Thirdly, CVCs guarantee that entrepreneurs do not behave opportunistically in the product market by expropriating the corporate's R&D know-how (Gompers and Lerner, 2000). Lastly, CVCs have a strategic rationale (e.g., Hellmann, 2002; Dushnitsky, 2011) as it can increase the corporate value in different ways and, among these, one interesting use case is the generation of demand for the corporate's core products. Starting with these elements in mind, Ryanto and Schwiendbacher (2006) developed a theoretical model explaining how opening a corporate venturing unit results from the potential interactions between the corporate and the startup in the product market. More precisely, the decision to set up the fund is directly related to the amount of demand that the corporate can secure through the CVC fund. Three are the decision-making variables considered by the authors, namely:

- i) The complementarity between the dyad offerings
- ii) The degree of product specialisation
- iii) The marginal costs incurred in manufacturing the product in both the downstream and upstream market.

In their model, the corporate is considered a supplier of specialised inputs and directly competes with standardised input producers to secure the new venture as a client. The corporate produces the specialised input "A" and has a monopolist position in the specialised segment. General producers manufacture input "B" and operate in a competitive market. Both have a secure demand from other markets by producing different products than the one manufactured for the entrepreneur, and thus, even without selling their product to her, they can survive. "A" input is potentially superior, i.e., if the input is used, the entrepreneur will benefit from complementarities by reducing the entrepreneur's marginal costs in producing the final products. For this to happen, the entrepreneurs should adjust the production process's development phase, increasing the fit between the two. In other words, it could be superior only if they undertake complementary efforts, which involves both fixed costs and variable costs. In their analysis, the entrepreneur will have to add these costs to the general R&D efforts, i.e., the one sustained when adopting general input B.

Summing up, the entrepreneur, in order to produce her products, needs to select one of the two suppliers' input after a cost-benefit analysis. Input "B" involves a standard R&D effort but

does not have any potential upside benefits. Conversely, input "A" may be superior, i.e., complementarity, but requires a greater level of efforts than in the other case, i.e., complementary efforts.

Independently from the input chosen, the entrepreneur, being wealthless, will have to raise funds to develop her project. The funding can be raised either from an external investor or a CVC. In the model, the focal corporate's CVC is the first alternative to external investors, i.e., IVCs. The CVC offers a take-it-or-leave-it contract indicating the entrepreneur the outside option payoff ex-ante, i.e., her profit accrued from contracting with an external investor. The entrepreneur evaluates mainly two clauses:

- i) The level of complementarity to achieve
- ii) The fraction of shares requested.

Exit via IPO or failure takes place once the product is developed and launched. In order to be successful, the entrepreneur has to innovate in the product market as it will allow her to compete there as a monopolist.

The Model

The game will unfold into three macro-phases:

- i) Contracting phase, i.e., the entrepreneur chooses the investors
- ii) R&D stage, i.e., where the level of complementarity is set, and the product is developed
- iii) Production phase, i.e., investors exit as the product has been developed, and the final good's input price and final quantity are set. If the entrepreneur has not successfully developed the product, the venture is liquidated.

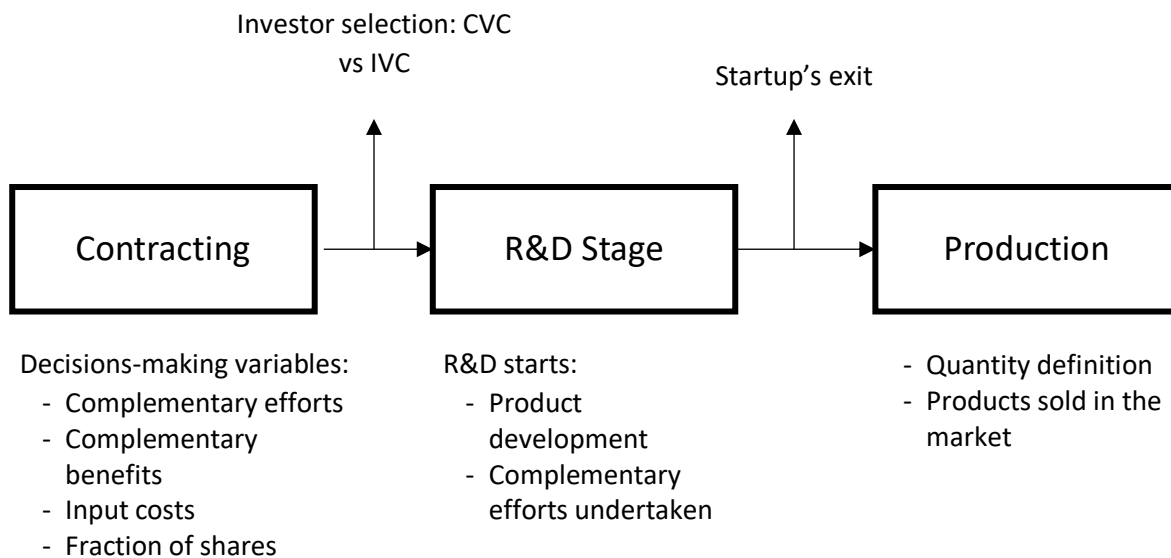


Fig. n. 8 – Ryanto and Schwienbacher's Model (2006)

In the hypothesis of CVC's absence, the entrepreneur will obtain financing from other external funders, but this, for the corporate, does not exclude ex-ante the input A's purchase. The entrepreneur will select input A if complementarity benefits outweigh the complementarity effort and the input costs. Therefore, there will be an input A's equilibrium price for which the entrepreneur is indifferent between the two inputs. To secure the demand, the corporate should set a price just a bit below this optimal level.

In the case of external financing, the entrepreneur and the external investor have no incentives to carry out complementary efforts. Thus, the corporate can secure demand solely when input A's cost is consistently lower than input B's cost, limiting the flexibility for an undercutting price strategy to secure demand in the upstream market.

In the case of CVC financing, the corporate can enter into a relationship with the entrepreneur from the contracting phase and adopt the equity tie as a leverage to obtain demand from input A. To secure the contract with him, the corporate proposes the acquisition of a smaller fraction of equity than external investors but, in exchange, requires complementarity efforts in the R&D stage. Two contingent factors can facilitate the bargain. First, the bigger the downstream market, the higher the corporate's incentives to finance the venture by giving up a greater shares portion. Second, CVC will be preferred when the competitive pressure from Input B's market is high. Competition decreases prices also for substitute products. However,

it means that the undercutting price strategy may become at one point unsustainable from a financial point of view.

Considering the entrepreneur point of view, everything else being equal, she will be more willing to enter into such an agreement if the complementary efforts required are lower, i.e., she tries to minimise the efforts. It follows that the corporate has to set the input "A" price considering the trade-off between the entrepreneur's willingness to enter the agreement according to the overall costs (complementary efforts plus the input cost weighed with complementary benefits) and the deal profitability according to the required shares' fraction. Therefore, considering the complementary efforts as the main decision variable, three scenarios are possible. Firstly, there will be such a high effort level for the entrepreneur that the undercutting price strategy would be impossible to carry out, leading to negative profit for the corporation. A second scenario, where the effort level allows the corporate to undercut input price in the agreement, but the profit obtained would not justify the amount of funds provided to the entrepreneur. Lastly, there will be a complementary efforts level that allows the parent to undercut price and secure demand. Thus, under the condition that the overall costs (complementary efforts and material costs weighed with complementary benefits) of input A are at least equal or lower than the price of input B, the corporate venturing activities are a powerful means to secure the complementary efforts from the entrepreneurs, enabling the undercutting price strategy in the upstream market, and secure demand from the entrepreneur. In other words, CVC financing can provide more flexibility in terms of price-cutting strategy that otherwise would be unbearable and allows to obtain a higher slice of demand.

Extension 1: Acquisition

The original model did not consider acquisitions as a potential exit path. The authors developed an extension, including them and showing how CVCs would prefer them as the optimal path if the acquisition costs are low or absent. Indeed, the acquisition will solve the double marginalisation problem, avoiding the undercutting price strategy, and lead to higher profits.

Extension 2: Bargaining power

If the entrepreneur has bargaining power in the input market, she is willing to actively set her effort level and bargain for Input A's optimal price. It follows that the corporate is no longer capable of extracting value from the transaction as the bargaining game has lowered Input A's

price. Therefore, it has no incentives to set up any CVC unless the entrepreneur's bargaining power is not high enough to determine the inputs' price.

In another scenario, the entrepreneur may have bargaining power in the contracting stage and can leverage it to obtain a higher amount of funds for a lower portion of shares, leaving the corporate indifferent about setting up the CVC units. In this situation, if the entrepreneur has just some bargaining power, the corporate may have the incentive to set up the unit; otherwise, it is better off without it.

Lastly, if the entrepreneur has simultaneously bargaining powers in both the contracting stage and the input market, she is indifferent to either IVC and CVC financing and can set her optimal value of efforts and Input A price.

Extension 3: Other markets for Input A

In the model, the authors assumed that Input A could have been used solely by the entrepreneur. However, the model remains true even if the corporate can sell the input to other markets for different purposes. Indeed, other markets' presence softens the price competition and provides more bargaining power to the corporate, asking a higher price for its input. Besides, it will provide more incentives to set up a CVC, as complementarity is directly correlated with venture capital fund provision.

Extension 4: Entrepreneur as a Distribution Channel

The last extension considers input A as a complementary product of the entrepreneurs' offering for the final customers. In other words, the entrepreneur sells the products to the downstream market and secures indirect demand for the corporate. In this extension, the corporate and the entrepreneurs face the same costs and benefits as in the original model, with the corporate directly interested in the entrepreneurs' complementary efforts. Therefore, in the indirect demand case, the model does not change and leads to the same results.

3.3.2 Fulgheri and Sevilir's (2009) Model

Fulgheri and Sevilir (2009) analysed the CVC issue by adopting a make or buy perspective. They assumed that two different organisational forms could undertake the development of a new product. On one side, via CVC arm as an outside-the-boundaries innovation activity, i.e., a non-integrated structure; on the other side, via internal R&D program as a within-

boundaries innovation activity, i.e., a merged structure. Each of them presents some pros and cons that the authors investigated while uncovering the model.

More precisely, in the model, two firms compete in the same market and want to invest in an R&D project to generate innovation in the form of a new product or technology. Innovation guarantees the first mover obtaining a monopoly position. Conversely, if both innovate simultaneously, they will obtain a positive duopoly payoff, which is lower than the monopoly one. To carry out the R&D activities, firms have to raise money either internally, leveraging their own resources or externally from professional investors. The research unit carries out the innovation activities, and the managers can organise them as an outside-the-boundaries independent entity, i.e., a portfolio firm from the CVC arm, or as an in-house division, i.e., an R&D department. Either internal or external sources can fund the CVC arm; conversely, internal projects will be solely financed by the firms' fund.

Four steps compose the game:

- i) Each firm decides the organisation form, i.e., internal vs external R&D
- ii) Firms choose the optimal effort level
- iii) The research project will yield the first results, i.e., monopoly, duopoly, or no-demand profit
- iv) Project development can begin according to the results obtained.

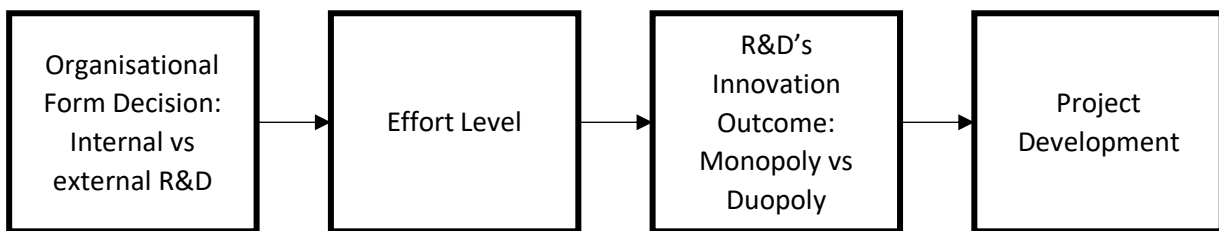


Fig. n. 9 – Fulgheri and Sevilir (2009)

It is worth noting that both of them select the effort level simultaneously according to the organisational structure that will guarantee a higher probability of success, i.e., better outcome. The external R&D unit is considered as a startup having technical capabilities but no commercial power. In other words, it will be the owner of the technology, but it will have to sell it via licensing through the corporate.

Competition and Organization of Innovation

Fulgheri and Sevilir (2009) argued that the choice between integration and spinning-off strictly depends on the level of competition and the research unit's productivity. To better explain, they leveraged on three main effects:

- i) Incentive
- ii) Strategic
- iii) Cash Flow Effects.

The Incentive Effect refers to the intrinsic motivation that determines the effort the two firms will undergo in the process. Under non-integration, the research unit has an ownership right on the project, i.e., it can directly profit from the innovation. It follows that it has far more incentives to provide efforts than under the merge case, where the firm expropriates all the surplus. Consequently, the probability of obtaining better outcomes increases in the non-integrations case as the unit will strive to become more efficient and obtain more profit. This setting also allows the corporate to exert less effort, still maintaining favourable success outcomes. Therefore, the corporates - as for the incentive effect - will always favour CVC financing, which guarantees them to compete more aggressively in the R&D games.

Concerning the Strategic Effect, the authors consider the interaction between the two competing innovation units (the two corporates and their respective research units) and state that a pair's effort decreases in the rival pair's effort. In other words, the endeavour increase from one innovation unit has a direct and negative impact on the others' effort. Considering that, as demonstrated by the Incentive effect, the non-integration provides more incentives than integration to the research unit, the former is most suited to leverage the strategic effect. Therefore, according to the level of competition, i.e., the level of effort put in by competitors, the corporate will tend to prefer non-integration as the competitive pressure increases.

The last effect is the cash flow effect which is strictly related to the research unit resources constraint. Under the non-merge option, the research unit lacks the financial resources to carry out the project. Therefore, the corporate has to disburse, ex-ante, the amount of money necessary and wait to realise the return on the investment. Under this hypothesis, it will have to share part of the future cash flow generated to the independent unit due to the licensing agreement. Therefore, for what concerns the cash flow effect, the best solution remains integration.

Summing up, the choice of setting up a CVCs fund will directly depend on contingency. Assuming that competition is absent, the choice solely depends on the productivity of the two research units, and, thus, the company will select the merge option only if the internal R&D is the more productive; otherwise, it will prefer CVC financing. However, the situation is a little different when the competition enters into place. When the competition is higher, the best solution remains non-integration as it guarantees a more aggressive approach to innovation. However, when the competition level is low, the choice will directly depend on the single case productivity and competitiveness.

Non-Integration Case: Competition and the Optimal Level of Financing

The authors hypothesise that every player chooses the non-integration option and that the research unit can either raise the money from the external capital market or the corporate funds and investigate whether they impact on CVC's investment decisions.

They argued that external financing directly impacts on two of the three effects mentioned above, i.e., the Incentive and Cash Flow effect. The first to be influenced is the Incentive Effect. Firstly, the provision of external financing reduces the incentive of the research units. As previously mentioned, the research unit and the CVC decide how to divide the payoff from the innovation; however, with an external financier, the research unit has to share part of the final profit with another entity and therefore is less willing to enter in an equity tie with the CVC. Concerning the Cash-Flow Effects, it is positively affected by the presence of the external financier. The corporate does not have to bear entirely the new project financing leveraging solely on its financial resources.

On top of this, external financing indirectly impacts on the CVCs investment decisions via its interplay with the competition. More precisely, competition, coupled with external financing, highlight the strategic role that CVC arms can exert. External financing on one side decreases the startup's innovation effort but simultaneously nudges the competitive pair to increase their effort level. In other words, by limiting external financing and substituting it with corporate funding, all else being equal, the corporate can simultaneously increase the portfolio firm's effort and decrease competitors' effort.

Therefore, in order to understand the optimal level of corporate funds to provide for the startup, the authors pointed out three main observed effects:

- i) Incentive Effect. CVC financing will guarantee a higher level of effort from the startups as it limits its profit dilution due to a lower share of external-equity partners
- ii) Strategic Effect. The increase of effort from the financed startups negatively impacts the effort carried out by the competitive pair. The decrease of effort from the competition increases the expected final surplus of the corporate
- iii) Co-financing Effect. The high investment expenditure due to the lower level of involvement from external funders will negatively impact the corporate's expected profit.

Thus, considering the three effects, the optimal CVC investment level will always depend on the research units' competition level and productivity. More precisely, the optimal level of external financing decreases in the research unit's productivity level, i.e., it is more costly to dilute the research units' effort when it is more productive. Meanwhile, the level of competition increases the strategic aspect of the CVC investing, with the corporate willing to approach innovation more aggressively to ensure success in the product market. Thus, the CVC financing level will be higher and external financing lower in competition than in monopoly.

IVC as External Funder

The authors finally investigated how the model's results would have changed if the external investor was not a generic one but an independent venture capital. Unlike other investors, it also provides additional services such as mentoring, advice, and human capital (e.g., Amit et al., 1998), directly improving the probability of research project success.

Its presence will alter one of the three effects before mentioned, namely, the Incentive Effect. The latter will be less intense as the IVCs will increase the likelihood of success, thanks to the additional services provided. The other two – the Co-Financing and the Strategic Effects – are unaltered.

The positive and direct correlation between the competition and the CVC financing remains: the increase of competitions will lead to a higher share of corporate funds. However, when the research unit is not so productive, the IVC may come at hand: they can decrease the financial burden and still improve the exit event's likelihood.

The authors suggested that early-stage startups are more productive conversely to later-stage ones; thus, the share of CVC funding will be higher in an early-stage project than IVC financing.

3.4 Empirical Evidence: Is It Worth It For The Corporate?

After deepening into the theory, it becomes crucial to analyse the empirics about the CVCs' impacts on the corporate parent. It is worth remembering that CVCs have a strategic value for their corporate, which is more difficult to quantify than the investment's financial return. However, scholars have been trying to measure CVC's impact on corporates by adopting different proxies such as innovation and financial performances. Until now, the evidence seems to support the thesis arguing that CVC initiatives can be labelled as a valuable investment for the corporate.

3.4.1 Impact on Innovation Performances

Corporate's decision to set up a corporate venture capital arm may reside in the desire to capture innovation from outside by leveraging on an equity tie with startups. It is possible by accessing various knowledge sources such as products, practices, and technology (Chesbrough and Tucci, 2003). The key point is securing effective knowledge acquisition and utilisation from portfolio firms which are supposed to boost the corporate innovation rate over time and increase the likelihood of creating new technologies (Ahuja and Lampert, 2001). Three are the main moments in which the corporate can learn about the venture.

First, in the pre-screening phase, the corporation evaluates the startups and can obtain information before committing capital. Usually, R&D managers are involved in evaluating the venture's technological feasibility and C-level's capabilities to gauge market and business risks (Henderson and Lelux, 2002). Besides, screening several startups allows the corporate to hone its sensitivity to new technological trends in the market (Chesbrough, 2002).

Secondly, during the investment phase, the CVC monitors the startups via board membership or strategic alliances with them. Besides, the parent corporation sets up practices to favour knowledge-sharing activities between the parties; indeed, successful learning has always been recognised as a function of effective interaction (Arrow, 1974; Daft and Lengel, 1986).

Thirdly, a failing startup represents a learning opportunity, especially if the developed technology remains valuable after the liquidation event (Hoetker and Agarwal, 2004). Failure has information weight (McGrath, 1999), and it allows to understand what attracts the market

and gains insights into the technology (Gompers and Lerner, 2000; Maula et al., 2003b; Dushnitsky and Lenox, 2005b; Ivanov and Masulis, 2008).

Dushnitsky and Lenox (2005b) carried out one of the most important studies on CVC's and its impact on the corporate's innovation rate. The authors considered a panel of US public firms between 1969 and 1999 from the VenutreXpert database and evaluated innovation improvement after a CVC arm's setup. The innovation measure adopted was the firms' citation-weighted count of patents.

The authors started their analysis by arguing that CVC initiatives offer huge learning opportunities for corporations. More precisely, venture capital investing offers compounded learning benefits: the larger the investments undertaken, the more ventures accessed, and the greater the stock of knowledge acquired. The greater access to knowledge sources, in turn, should increase the likelihood of introducing innovation at the corporate level. For the authors, two different mechanisms can explain the phenomenon (Ahuja and Katila, 2001):

- i) Combinatorial Innovation: a knowledge base expansion increases the possibility to generate innovation via knowledge combination (Kogut and Zander, 1992)
- ii) Absorptive Capacity: being exposed to novel technologies increases the firm's absorptive capacity, i.e., the ability to harness external knowledge (Cohen and Levinthal, 1990).

Dushnitsky and Lenox (2005b) proved the effectiveness of these two mechanisms showing how firms with a more significant share of CVC investments were the ones experiencing a higher innovation rate.

However, the results' magnitude depended on two elements, the Intellectual Property Regime (IPR) and Absorptive Capacity intensity.

Concerning the IPR, the investment firms' ability to access portfolio firms' knowledge directly correlates to the latter's ability to shelter intellectual property (Anand and Galetovic, 2002; Gans and Stern, 2003). The reasons can be two. First, under weak IPR, the new venture may recur to secrecy to protect the idea (Cohen et al., 2001), and the corporate can only tap into the technology via a close-knit relationship, i.e., making a CVC investment; while under strong IPR, the corporate can opt for another agreement such as licensing which is less cash-intensive. In addition, even though the technology is patented under weak IPR, the corporate is more likely to misappropriate as cash-constrained ventures are not able to sustain the high costs for protecting the technology (Lerner, 1995a). More precisely, startups start from a

disadvantaged position compared to corporates that have slack resources to invest in a lawsuit. Therefore, the startups may decide not to spend cash for a weak patent that competitors can easily misappropriate. Indeed, Dushnitsky and Lenox (2005b) proved that the weaker the IPR, the higher the impact on the investing firms' innovation rate.

Concerning the absorptive capacity intensity, it is worth remembering that the firm's ability to harness the knowledge source from the outside is a function of the developed internal capabilities. In other words, internal and external knowledge are interdependent (Cohen and Levinthal, 1990). Evidence showed how internal R&D favoured the collaboration between other R&D centres (Kleinkent and van Reijen, 1992) and that the expertise in a given domain increases the level of knowledge absorption from external sources (Pisano, 1991; Veugelers, 1997). Thus, it is reasonable to assume that firms with a strong baseline in innovation will benefit the most from the portfolio ventures innovation. The authors proved that this hypothesis is true: internal R&D represents a foundation upon which the external knowledge can be understood and capitalised.

Six years later, Dushnitsky and Lenox (2011) investigated the same sample but refined their analysis. They did not solely analyse the corporate patents' citation-weighted level but also the absolute patenting level to better understand the magnitude of CVC investment. Besides, they evaluated the ROI of the R&D activities compared to CVC ones. The comparison measure adopted was the ratio between the expenditure in either CVC or R&D and the firm's assets. The results are interesting. A corporate venturing unit's setup does not increase the absolute level of patents but only in terms of citation-weighted patenting level. Therefore, it is reasonable to assume that CVCs impact on the quality of the innovation activities rather than the quantity. Interestingly, the impact of CVC investment on the patenting quality seems to be higher than the R&D investment's one, indirectly suggesting that the return of investment from a CVC program is greater. The results are coherent with the assumption that, by interacting more frequently with external new ventures, the corporation is more exposed to pioneering technology and can increase the likelihood of producing innovation (Ahuja and Lampert, 2001).

To sum up. CVC programs' benefits compound as they provide, on one side, access to novel innovation while simultaneously improving the absorptive capacity of the firms in a greater magnitude than R&D activities.

3.4.2 Yang (2012) - When CVCs Do Not Improve the Corporate's Innovation Performances

Adopting an organisational learning theory point of view, Yang (2012) sustains that the sole adoption of corporate venturing initiatives cannot guarantee to improve the corporates' innovativeness. They can lead to positive results only by adopting suitable organisational models. She analysed a panel of US public corporations that had undertaken a CVC investment between 1996 and 2000 and opted for the same measure as Dushinitsky and Lenox (2011), namely, unweighted patent counts and citation-weighted patent counts.

Conversely to what previously found, the authors' evidence demonstrated that the CVC investment did not significantly increase the corporate's innovation rate. She argued that it might be possible that corporates do not possess the absorptive capacity necessary to harness the external knowledge flows or, conversely, they were not able to learn appropriately. Indeed, as pointed out by the organisational learning theory, learning does not always lead to a performance improvement, especially in uncertain and ambiguous domains where the probability of learning something incorrect increases (Huber, 1991). In other words, it may be that even though the corporate has a good level of absorptive capacity, the context condition renders it difficult to exploit this capability.

However, Yang (2012) argued that the crucial element to improve the learning process and impact innovation was to adopt a particular governance setting. More precisely, tackling the issue from an agency theory point of view, she analysed how three governance characteristics can influence innovation performances, namely:

- i) Incentive schemes
- ii) CVC level of autonomy from the corporate
- iii) CVC board representation in the startup.

Concerning the incentives schemes, the author suggested that the high-powered compensation scheme may be a double-edged sword for corporate innovation performances. More precisely, on one side, they guarantee managers commitments and align their objectives to the portfolio firm's performances. On the other hand, they induce managers to pursue financial rather than strategic benefits. Objectives influence people's behaviour (Galbraith and Merrill, 1991) and thus, adopting outcome-based compensation may send misleading signals

to CVC managers who can, in turn, focus on their interests rather than considering the principal's ones. It can be a source of possible conflicts. For these reasons, the author argues that salary-bonus should be the best solution to achieve strategic goals better, i.e., improve the innovation rate. The reasons are two. Firstly, strategic goals are challenging to measure and, as a consequence, behaviour-based compensation, such as salary, is more appropriate (Eisenhardt, 1989a). Secondly, bonuses tie CVC managers' objectives to the corporate's ones avoiding possible conflicts of interest. Thus, even though a salary-based-bonus may reduce CVC managers' commitment, it should guarantee an alignment in terms of objectives and encourage the manager to live up to the strategic goals by transferring knowledge. The author provides support to these assumptions by registering an increase in innovation performances. Regarding autonomy, the corporate faces a trade-off in setting up its optimal level. On one side, tight control should avoid agents' free-riding, but, on the other hand, it entails high monitoring costs. Besides, the entrepreneurial environment is highly uncertain, and control may hinder the capabilities to exploit new opportunities requiring quick decision-making (Gomper and Lerner, 2001). Thus, under such a complex context, the principal tends to empower the agent with more autonomy in terms of managerial discretion and low task programmability, even though it may result in higher information asymmetries (Eisenhardt, 1989a; Gerhart and Milkovich, 1990; Gomez-Mejia, 1992; Rajagopalan and Finkelstein, 1992). Therefore, the author assumes that adopting an IVC-like autonomy would increase difficulties in cooperation and decrease the incentives to transfer knowledge. The evidence collected by her confirmed the hypothesis with an increase in innovation performances.

Lastly, board representation is considered by agency theory as one of the most effective mechanisms to reduce asymmetries and control behaviour (Fama and Jensen, 1983). Not surprisingly, it is one of the most widespread monitoring modes in CVCs investments (Gompers and Lerner, 2001b). It guarantees access to portfolio companies' operation insider information and allows them to have a window on new technologies and industry trends (Gompers and Lerner, 2001b). Therefore, she assumed that a higher board representation should lead to higher information flow from the portfolio firms to the corporate. However, the evidence proved that the hypothesis was wrong. It may be that startups are afraid of corporate misappropriation (Gompers and Lerner, 2001b; Masulis and Nahata, 2009) and protect even more their insider information hindering the information flow.

3.4.3 Wadhwa et al. (2016) - Portfolio Diversity and Innovation Rate

One of the main advantages of a CVC compared to an R&D project is interacting with a massive pool of knowledge beyond its boundaries. The types of knowledge that a corporate can tap into are various and, for the recombinatory search literature, can be clustered in two main groups (Fleming, 2001; Katila and Ahuja, 2002; Schilling and Green, 2011):

- i) Knowledge breadth (or scope), i.e., the diversity of knowledge domains an actor deals with (Katila and Ahuja, 2002; Laursen and Salter, 2006)
- ii) Knowledge depth, i.e., the stock of knowledge accumulated in a specific domain (Katila and Ahuja, 2002; Laursen and Salter, 2006).

Parent corporations can benefit from both of them in different ways. In particular, startups' knowledge depth provides access to richer information in order to investigate a specific domain better and improve the ability to integrate such knowledge in the organisation; at the same time, the parent can tap into new knowledge space that may favour recombination by increasing the knowledge breadth by widening the portfolio diversity, (Gavetti and Levinthal, 2002; Katila and Ahuja, 2002). Therefore, to better assess the CVC impact on the parent firm innovation rate, it is vital to analyse the portfolio composition in terms of knowledge domain exposure.

Wadhwa et al. (2016) carried out one of the most exciting studies on knowledge depth and breadth's impact. The authors studied a panel of telecommunication corporates from 1989 to 2000. They investigated how their innovation performances – computed as forward-citation-weighted patent counts, i.e., citations that the patent receives from other patents – are impacted by the portfolio composition by analysing the SIC code of portfolio firms.

The Impact of Portfolio Diversity on Corporate's Innovation

The authors first analysed the impact of portfolio diversity on innovation. According to them, diversity implies both pros and cons. On one side, it improves the relative novelty of knowledge at disposal within the portfolio. The more the startups are different, the higher the chance for the investors to access new information necessary for innovation (Greve, 2007). Indeed, the potential combinations of knowledge increase and open up new solutions (Fleming, 2001). Besides, a diverse knowledge base can increase the willingness to share

knowledge and reduce protectiveness from startups. When the knowledge domains are similar, they are highly substitutable (Stuart and Podolny, 1996) and startups, fearing misappropriation, protect their knowledge more (Dushnitsky and Shaver, 2009). Besides, diversity solves the corporate's resources allocation issues. More precisely, when portfolio firms have the same knowledge domain, they are likely to ask the investor for the same limited resources, and it will generate interdependency between them (Levinthal and Wu, 2010), leading to possible conflicts. Therefore, having a diverse portfolio decreases the requests for the same resources, allowing the corporate to support the startups better.

On the other side, a diverse portfolio entails some costs. Corporates undergo a great effort to assimilate and integrate such diverse knowledge (Cohen and Levinthal, 1990). The corporate will face cognitive challenges in managing distinct domains (Fleming and Sorenson, 2001) and organisational challenges, as it will have to adapt the communication process (Kogut and Zander, 1992). Besides, as the diversity increases, the firms' ability to detect and assimilate different knowledge domains decreases (Lubatkin et al., 2011), leading to a cost increase for combinatorial innovations (Weitzman, 1998). One way to improve a diverse portfolio's efficiency and effectiveness is to invest in clusters of startups, i.e., diverse groups with complementary or similarity within them (Vassolo et al., 2004).

It becomes clear that diversity can benefit the parents' firm up to a certain point, and, after that, the increase in complexity will backfire.

From these assumptions, the authors proved that the relationship between firms' innovation performances and portfolio diversity is not linear but has an inverted U-shaped relationship. Portfolio diversity can provide benefits up to a certain point: the more the domains manage to increase, the more difficult it will be to integrate them to create synergies. Conversely, low diversity can hinder the recombinatorial potentiality coming from the combination of different knowledge bases.

The Impact of Portfolio Depth on the Corporate's Innovation

Concerning portfolio depth, the authors argued that startups might possess a large stack of knowledge that can be not well developed or embedded in routine activities due to their lack of formality in their processes (Stinchcombe, 1965). It will decrease their ability to signal their quality to the parent companies, which cannot understand the knowledge to extrapolate from them and may lose the incentives to provide supporting activities (Tallman and Phane, 2007). On the other side, some evidence demonstrated that when the portfolio firms have deep

specific domain knowledge, they are more able to communicate and transfer it to the corporate (Zhao and Anand, 2009). In this case, startups can be considered a vast source of information, leading the corporation to improve its recombinatorial capability (Almeida and Phene, 2004; Baum et al., 2000; Salomon and Martin, 2008; Stuart, 2000).

From these elements, Wadhwa et al. (2016) assumed that portfolio firms' knowledge depth would play a mediating role between portfolio diversity and its impact on innovation. More precisely, it will decrease the surging costs of diverse-knowledge combinations and improve the firms' absorptive capacity. They confirmed this assumption by demonstrating how parent firms managing a portfolio of startups with deep knowledge were more able to harness the benefits coming from diversity.

The Impact of Portfolio Firms' Network on the Corporate's Innovation

The network of partners surrounding the portfolio firms play another mitigating role to diversity. New ventures typically cope with their resource constraints by starting collaborative relationships with other established firms (Baum et al., 2000; Shan et al., 1994). The benefits of these alliances compound for the new ventures. They access vital resources and improve their know-how (Powell et al., 1996) and their capability to exchange them across the organisational boundaries (Dyer and Singh, 1998; Kale et al., 2000; Lavie and Rosenkopf, 2006). It follows that a corporate can indirectly benefit from these alliances in a variety of different ways. For example, it can benefit from knowledge spillover (Ahuja, 2000) and increase the depth of knowledge collected through portfolio firms. Indirect ties enable gathering relevant information about technology directories and new ventures' failure probability. In other words, they act as a screening mechanism (Leonard-Barton, 1995) and favour the combination activities (Ahuja, 2000). Lastly, previous studies demonstrated indirect knowledge sources' positive impact on firms' innovation performances (Phelps et al., 2012)

The authors, starting from these assumptions, proved the portfolio startups network's role by showing how it mitigates diversity's negative effect. In other words, it increases the knowledge depth of the corporate, which can better manage a diverse portfolio and harness its benefits.

3.4.4 Exploration and Exploitation of CVC activities

Since its inception and even more with the advent of digital technologies, strategies on pursuing ambidexterity have been spreading in the literature (e.g., He and Wong, 2004; Lavie et al., 2011; Raisch and Birkinshaw, 2008). The reason behind this is the desire to achieve the core organisational advantage granted by ambidexterity, i.e., the ability to simultaneously pursue exploitation and exploration activities (March, 1991). Exploration refers to experimentation and discovery, allowing the corporate to acquire new knowledge and unfamiliar technologies. It follows that learning is slow and uncertain, but, in the long run, it can lead to radical innovation outcomes (Rosenkopf and Nerkar, 2001). Conversely, exploitation is related to execution and implementation that favour incremental innovation by leveraging already-held knowledge (Duncan, 1976; Eisenhardt & Martin, 2000; Levinthal & March, 1993; March, 1991; Tushman & O'Reilly, 1996).

Scholars have identified two different ways to achieve ambidexterity and balance the exploration and exploitation forces:

- i) Organisational separation, i.e., creating dedicated units to exploration-related activities working separately from other exploitation-focused departments (Hill and Birkinshaw, 2014)
- ii) Temporal separation, i.e., undertaking explorations and exploitation activities at different moments in time (Puranam et al., 2006).

CVCs are a powerful tool in the corporate's hands to generate innovation and can be a conduit for exploitation activities via organisational separation. However, several studies argue that they may be not the most appropriate means to achieve this goal (Campbell et al., 2003; Hill and Birkinshaw, 2008, 2014; Keil et al., 2008a; Schildt et al., 2005).

3.4.4.1 Lee et al. (2018) - Structural Autonomy and The Explor-/Exploitation Degree

Lee et al. (2018) tried to understand the innovation strategy that the corporate could pursue through their CVC arms by analysing a panel of US firms that had conducted CVC investments from 1990 to 2010. They wanted to understand the explorative and exploitative nature of the corporate venturing units and how structural autonomy could influence the innovation activities' trajectory. They classified CVCs into two types according to their level of autonomy. On one side, Independent CVCs are usually set up as a separate fund pool and can be free

from any restrictions concerning investments. On the other, Integrated CVCs are a BU following the corporate's guidance for their investment activities.

Scholars argue that CVC autonomy is necessary to achieve better performances as it needs to ignore the desire for short term results to undergo bold investment activities (Simon et al., 1999). In other words, the ideal setting should be the adoption of the typical governance system of an IVC to make autonomous decisions and obtain flexibility. Also, autonomy would reduce the conflict of interest between the CVC and the corporate itself (Burgelman, 1985; Dougherty, 1995) and open up the opportunity to freely interact with specific business units (Birkinshaw and Hill, 2005). On the other hand, its investment can lead to no result for the corporate's business model in the short-run (Chesbrough, 2002; Siegel et al., 1988; Yang et al., 2016). Besides, it may invest in potential competitors of some of the corporate's business units. The trade-off is evident. Therefore, in their studies, Lee et al. (2018) settled the issue and demonstrated that CVC programs organised as a wholly-owned but separated unit score better in explorative innovation, i.e., an increase in patents application for technologies coming from new classes compared to ones previously owned by the corporates.

On the other side, it is reasonable to assume that CVC units with less autonomy will carry out operations in a completely different way compared to the more autonomous ones and can be more suited for exploitative innovation. Indeed, to excel in this kind of innovation, it is necessary to rely on routines, resources (Gupta et al., 2006), and core capabilities accumulated over time (Hoan and Rothaemel, 2010; March, 1991). In other words, CVC units operating inside the parent firms may be advantaged in exploitative learning. This governance setting should favour structural connection, which increases the interactions and the sharing of human resources and knowledge. It also facilitates the definition of the proper criteria for valuable and complementary investment targets to improve the corporate's existing knowledge base (Hill and Birkinshaw, 2008). Besides, experts from the parent company can easily collaborate with the CVC to extract value from portfolio firms and increase the innovation performances in the short-run (Carnabuci & Operti, 2013; Cohen & Levinthal, 1990). Lee et al. (2018) confirmed these hypotheses by demonstrating how adopting an integrated CVC unit will negatively affect the corporate exploration performances by decreasing the request of new-knowledge domain patents.

3.5 CVC and Financial Performances

CVC initiatives represent a unique opportunity to learn about new technologies, products and market trends (e.g., Kann, 2002; Keil, Zahra, and Maula, 2004; Dushnitsky, 2006, Mason and Rohner, 2002) and therefore can have a positive impact on the absorptive capacity of the firms (Cohen and Levinthal, 1990), i.e., the capacity to understand and integrate knowledge from external players. Absorptive capacity is crucial in any innovation-related activity, but it can also help improve directly and indirectly financial performances. In the following paragraphs, evidence will be introduced about the impact of CVC investment on the financial performances of the parent companies

3.5.1 Benson and Ziedonis (2009) – CVC and Parent's Acquisition performances

The corporation could redeploy the learning from corporate venturing activities in other activities such as acquisitions. Scholars agree that acquisition represents a huge opportunity but, at the same time, entails many hidden risks. On the one hand, they are a conduit for renewal, allowing the speedy introduction of new products or the improvement of the current technologies (Graebner and Eisenhardt, 2004; Grandstrand and Sjolander, 1990; Puranam et al. 2006; Ranft and Lord, 2002). On the other, the acquirer may face significant difficulties in integrating resources and capabilities (Coff, 1999). Lastly, startups are privately owned, and it is not easy to obtain complete information about their conditions. Therefore, many problems may be uncovered ex-post (Capron and Shen, 2007; Shen and Reuer, 2005). On the other side, even when the information is available, the evaluation process is complex because of knowledge-intensive assets (Coff, 1999; 2003) characterising startups with an unproven track record in the market. Also, the startups' potential is usually tied to their employees that may depart or lose productivity during and after the acquisition (Ernst and Vitt, 2000; Graebner, 2004; Paruchuri et al., 2006; Puranam et al., 2009).

To conclude, the acquisition of a startup is risky and may not bring the desired benefits. In other words, the acquisition premium may well exceed the generated future profit.

One of the most famous works that tried to understand CVC's role in acquisition performance is the one carried out by Benson Ziedonis (2009). The authors analysed US corporates from

the IT sector that undertook CVC investments from 1987 to 2003 to gauge whether a corporate venturing arm's setup can improve their acquisition performances.

The authors started their reasoning by underlining the importance of CVC activities as helpful learning tools. More precisely, corporate venturing can allow for widening knowledge by evaluating startups, monitoring them, but also through failure (e.g., Gompers and Lerner, 2000; Maula et al., 2003b). Besides, they represent an opportunity to interact with IVCs or other players from the startup's ecosystems (e.g., founders, incubators). The authors classify these activities as outward-oriented and state that they could improve two dimensions of absorptive capacity relevant in the acquisition process, namely:

- i) Identification of valuable targets
- ii) Valuation of screened targets.

However, in order to fully harness the external knowledge sources, the authors stressed how internal knowledge plays a crucial role in detecting hidden values and creating more significant synergies in the post-acquisition phase (Barney, 1988). Internal knowledge stack directly influences absorptive capacity as it improves the ability to predict future trends (Cohen and Levinthal, 1994) and discerns promising nascent technologies challenging to evaluate, especially if intangible and early-stage (Coff, 1999). Secondly, a solid knowledge base can facilitate the assimilation processes of technologies obtained via acquisitions (Graebner, 2004; Higgins and Rodriguez, 2006; Paruchuri et al., 2006; Puranam et al., 2009). Therefore, it is reasonable to assume that the benefits of external knowledge absorption via CVC activities are highly dependent on the corporate's internal know-how. More precisely, the magnitude of the CVC's acquisition-enhancing learning will increase or diminish according to the parent corporation's investment in internal R&D capabilities. Benson and Ziedonis (2009) confirmed this assumption by providing empirical evidence showing how corporate venturing's beneficial effects on acquisition performances will decrease if the CVC intensity increases not proportionally compared to R&D expenditure.

In the second part of their study, the authors questioned the program longevity role as a signalling tool for sourcing more favourable deals and consequently improving acquisition performances. More precisely, corporates tend to seek co-investment opportunities with IVCs to improve their funding effectiveness (Gompers, 2002; Maula et al., 2003b) as sourcing deals from them means obtaining pre-screened information about potential targets' human capital, technology, and value (Gompers, 2002). However, once invested, IVCs tend to decide with

whom their portfolio firms should partner (Hochberg et al., 2007; Sorenson and Stuart, 2001). CVCs can be valuable partners providing complementary assets such as technical know-how, distribution channels and manufacturing (Chesbrough, 2002) and can act as a stamp of approval on the new venture's quality (Stuart et al., 1999; Maula and Murray, 2002). However, the IVCs, whose objectives are aligned with the entrepreneurs' ones, may fear the corporate presence due to the high misappropriation risk of proprietary information (Dushnitsky and Shaver, 2009; Hellmann, 2002). There may be an inherent conflict of interest in case the startups' strategy could interfere with the corporation's one (Block and MacMillan, 1993; Hellmann, 2002). Lastly, IVCs are afraid that a CVC may lose commitment to the portfolio companies after a parents' strategic shift rendering some startups' technologies no longer strategically relevant. For these reasons, IVCs can refrain from syndicating with CVCs without having certainties about their quality.

Therefore, it is reasonable to argue that IVCs may use the length of the CVCs programs as a proxy, a powerful signal that testifies the commitment and the trustworthiness of corporate investors. It should, in turn, increase the CVC investment performances. In other words, once the reputation effect kicks-in (Sorenson and Stuart, 2001), corporates can obtain compounded benefits from their CVC commitments by leveraging on a better network relationship with IVCs. Benson and Ziedonis (2009) proved this assumption showing how more stable corporate venturing initiatives experience a greater return on investment when acquiring technology startups compared to their peers with more "touristic" programs.

3.5.2 Corporate Value and CVC investments

Scholars consider CVCs as strategic investors, i.e., their assets' value is directly influenced by the investment. However, over time, some corporates have organised their CVCs activities mimicking the IVCs model, thus focusing more on the investment's financial side, i.e., return on capital. Indeed, CVCs should have all the capabilities to obtain lucrative financial returns for several reasons. First, they may possess the technical and market know-how necessary to screen the prospects better. Secondly, they position better to provide portfolio firms with complementary assets (Gompers and Lerner, 2000), social capital, and endorsements (Stuart et al., 1999; Maula and Murray, 2001), increasing the likelihood of the startups' success and

thus funds' profitability. However, conversely to IVCs, CVCs suffer from three structural deficiencies that may hinder their capabilities as pure investment vehicles, namely:

- i) Information asymmetries
- ii) Internal conflicts.

Concerning information asymmetries, entrepreneurs have more information about their venture than potential investors (Gans and Stern, 2003), leading to adverse selection issues. This problem is exacerbated for CVCs as entrepreneurs tend to protect their ideas more from well-established corporations that can misappropriate their innovations, mainly if they belong to the same industry (e.g., Dushnitsky, 2004).

Concerning internal conflicts, entrepreneurs may indirectly suffer from internal tensions within the corporation. Firstly, fund managers are usually paid with a high-powered compensation scheme and do not have a good reputation among corporate employees who want to uniform CVC managers' salary (Block and Ornati, 1987; Birkinshaw et al., 2002). However, sometimes, the conflict may be inevitable. The corporate may be forced to opt for such compensation schemes to overcome the talent attraction problems, as top tier investment managers are unwilling to accept a traditional bonus-salary compensation (Block and Ornati, 1987). The second source of conflicts may come from departments creating inertia to the CVCs program. CVCs are considered resource-consuming units that steal time, money, human capital, and assets otherwise allocated (Sykes, 1986).

Luckily, the strategic focus may turn out to be the strength of the CVC itself, as suggested by the study of Dushnitsky and Lenox (2006).

Dushnitsky and Lenox (2006) - The Role of Strategic Focus in Generating Value

Dushnitsky and Lenox (2006) argued that if the firm can keep a strategic orientation in its innovation activities, it will be able to overcome the program's structural deficiencies. Indeed, CVCs represent a unique opportunity to learn from portfolio firms starting from the screening process up until the post-investment process. First of all, CVC units tend to set up specific mechanisms to exchange knowledge and information with portfolio firms opening up for strategic learning (Arrow, 1974; Daft and Lengel, 1986). Besides, especially in terms of innovation benefits, corporates can increase their entrepreneurial knowledge stock by closely observing the startup's operations, products, and technologies thanks to board seats (Maula and Murray, 2001; Bottazzi et al., 2004). Lastly, considering the product market, the corporations may indirectly foster demand for its technologies by helping ventures develop

complementary products and services (Brandenburger and Nalebuff, 1996), as confirmed by the increase of the dyad's complementarity in the post-investment phase (Dushnitsky, 2004). For these reasons, the authors assumed that all else being equal, CVCs with a strategic focus will create more value than others. In their study, they were able to prove this hypothesis by showing how strategically oriented CVCs obtained a higher firm value, measured as Tobin's q, compared to financially focused CVCs. This effect is even stronger in industries where learning is more critical such as growing industries with many and uncertain opportunities or industries with low appropriability.

Chapter 4

Entrepreneurship and Venture Capital

The debate upon an overarching definition of entrepreneurship and entrepreneur is still open among scholars. Both are multidimensional and elusive concepts (Parker, 2018) that make it challenging to find a unique definition. Baumol (1993) argues that all the different views are complementary rather than exclusive, and it is necessary to look at them comprehensively in order to provide a clear picture of the matter.

4.1 Entrepreneurship: A Definition

The entrepreneurship theory started some centuries ago with Catillon (1680 -1734). He describes entrepreneurship as a risk-taking activity and the entrepreneur as a broker; to the author, entrepreneurship means self-employment, pursuing profit by taking action, connecting different parts of the market, and bearing risk. Starting from his vision, Hewley (1907) gave rise to a literature branch that associates entrepreneurship with self-employment or business ownership, where risk represents the distinctive element (Mill, 1984; Gleaser, 2007, Rosenthal and Strange, 2010). More precisely, Fisher's Separation Theorem considers a business owner as an entrepreneur only if her personal interests are bonded with the firm's ones (Spulber, 2014). This dichotomy has been criticised as it includes franchisee, independent professional or cooperative workers that are not entrepreneurial in their nature, but they are just affected by risk (Parker, 2018). Indeed, Hurst and Pugsley (2011) argue that entrepreneurship as business ownership is more suitable for explaining long-standing industrial and institutional structures within a country rather than an entrepreneurial venture. Therefore, it was necessary to wait almost a century to appreciate a refinement of Cantillon's definition with the work of J.B. Say's (1767 – 1832) and his concept of "Entrepreneurship as

Organizing". In his view, the entrepreneur's main value creation activities are coordinating, managing, and motivating the different production factors. Leibenstein (1968) brought forth the entrepreneurship-as-organising by introducing the "routine entrepreneurship" concept. He says that entrepreneurship is neither related to risk nor innovation, but it mainly connects with the entrepreneur's managerial capability (e.g., leadership, problem-solving). In this context, the concept of replicative entrepreneurs was born, i.e., someone who does not bring any innovation and satisfies the customers' demand but plays a fundamental role in increasing social welfare by replacing poorly managed firms and increasing overall market output (Baumol, Schilling, and Wolff, 2009; Baumol, 2010; Spulber, 2014). The idea of associating entrepreneurship with the management of new ventures has been criticised by Carland et al. (1984) and Holtz-Eakin (2000) as it misses all the elements related to innovation, growth, and opportunities pursuit.

It was necessary to wait for Schumpeter's work to appreciate an improved version of the previous definition (1883-1850). He introduced the concept of "Entrepreneurship as Innovation". Entrepreneurship is not merely connected to self-employment, but it is about introducing completely new paradigms in terms of:

- i) Product
- ii) Industrial processes
- iii) Markets
- iv) New supply sources
- v) New industry.

He coined the expression "creative destruction", i.e., the "process of industrial mutation that incessantly revolutionises the economic structure from within, incessantly destroying the old one, incessantly creating a new one" (Schumpeter, 1942); therefore, for him, the entrepreneur is the leader and the engine of a new business cycle. The entrepreneurs directly create opportunities through new combinations starting from scratch (Drucker, 1985; Timmons, 1989). This concept of entrepreneurship-as-innovation received several critiques. First, it will also include innovative activities that are not properly entrepreneurial (e.g., R&D department); secondly, it misses to consider that entrepreneurial activities do not end with the opportunity discovery and venture creation phases, but they involve ownership and management of innovation (Gartner, 1998; Rauch and Frease, 2000).

Even though the different definitions may seem diverse, everything can be summarised by Stevenson's words, "Entrepreneurship is the pursuit of opportunity beyond resource controlled" (Eisenmann, 2013). Indeed, an entrepreneur starts with discovering an opportunity, but her journey will involve a significant quantity of risk, creativity, and fatigue in turning the idea into reality.

4.1.1 Startups

The term startup has become a common jargon in the last two decades, and people refer to it as a young and innovative new venture. However, the literature has still missed theorising a widely accepted classification. Over the years, several definitions were developed. Two of them have turned out to be the most adopted in the industry. Steve Blank, a professor at Stanford and a Silicon Valley entrepreneur, theorised the first one in his book "Five Steps to Epiphany" (2005). He stated that a startup is "an organisation built to search for a repeatable and scalable business model", i.e., startups, due to their innovative elements, have to keep on experimenting to find a stable and replicable model.

Eric Ries, Blank's alumnus and Silicon Valley entrepreneur, in his bestseller "Lean Startup" (2011), suggested the second definition, which is a slightly different version than Blank one. He defines a startup as "a human institution designed to deliver a new product or service under conditions of extreme uncertainty", i.e., each group of people working on an innovative idea can be considered a startup. Therefore, differently from a traditional small enterprise, a startup has at least one new component in their business model requiring validation. A few years later, Forbes⁴, in an article listing all the features defining a startup, draws some interesting hints from Paul Graham, co-founder of Y Combinator, one of the biggest accelerators in the world. Graham suggested that temporal and organisational conditions are crucial in differentiating a startup from a traditional business. More precisely, startups are organisations set up to achieve unconstrained growth within their first five years of life, and, besides, the founders have to hold a fraction of shares in the company that has to remain independent, i.e., not acquired by an incumbent.

Therefore, combining all these contributions, it is possible to provide a solid taxonomy underpinned by three main defining characteristics:

⁴ Forbes (2013), What Is a Startup?, [link](#)

- i) Innovative business model or technology determining a high level of uncertainty
- ii) Ability to achieve unconstrained growth
- iii) Privately held entities with founders who are still shareholders.

4.1.1.1 New Technology-Based Firm

In the thesis, the analysis focuses on a particular typology of startups called new technology-based firms (NTBFs) (Storey and Tether, 1998).

They differentiate from other startups thanks to their specific characteristics, namely:

- i) Operate in high-tech industries usually characterised by intensive R&D activities
- ii) Significant values of intangible assets and lower investments in fixed assets and working capital exponentially increase the uncertainty connected to their product and business model

It is worth noting that they share the same ability to scale rapidly with fast growth, which is usually considered an indicator of success (Feaser and Willard, 1990; Fischer and Reuber, 2003; Barringer et al., 2005).

NTBFs are considered crucial for modern knowledge-based economies thanks to their ability to create more innovation and employment than similar non-tech firms (Audretsch, 1995; Westhead and Cowling, 1995; Audretsch and Thurik, 2001; Acs, 2004; Stam & Garnsey, 2008).

4.2 Entrepreneurs and the Need for VC financing

Song et al. (2008) demonstrated that the entrepreneur needs to accomplish a strategic-organisational fit encompassing the entrepreneurial team, the firm's resources, and the market opportunity to achieve success. Unfortunately, in their path towards this fit, NTBFs start from a disadvantaged position compared to other peers. First of all, young firms are usually resource-constrained and, more specifically, they do not have the capital, i.e., financial resources, necessary to develop their business and exit this impasse. Consequently, they have to rely on external investors to pursue their ideas (Stinchombe, 1965). However, external financing is not straightforward: high-tech entrepreneurs (Himmelberg and Petersen, 1994; Hall, 2002) who suffer from getting access to external capital due to the high level of innovativeness (therefore risks) of their ventures (Oakey, 1995; Egelin et al., 1997; Westhead & Storey, 1997; Giudici & Paleari, 2000). For this reason, NTBFs experience higher failure rates

than large firms (Bruderl et al., 1992), which instead have considerable financial and managerial resources (Cressy and Olofsson, 1997). The difficulties connected with obtaining external resources depend on capital market imperfections and, more precisely, information asymmetries that increase operating and financial risks for nascent firms.

4.2.1 Information Asymmetries

By definition, an individual suffers from information asymmetry when the opposite party has all the information, and, on the other side, she cannot access to them. Assuming that the individual is rational, the decisions she undertakes are bounded by her actual knowledge, i.e., she has "bounded rationality". The individual's decisions are, as a consequence, suboptimal; in other words, she could make better decisions if she had all the information (Simon, 1997). The literature classifies information asymmetries into two typologies, namely, adverse selection, i.e., ex-ante asymmetries, and moral hazard, ex-post asymmetries.

Adverse selection (Leland and Pyle, 1977; Myers and Majluf, 1984) happens during the pre-contractual phase. A party is not able to capture all the necessary data to become fully aware of the characteristics of the other party's product/service/person; in other words, she has not enough information to judge the actual quality (Akerlof, 1970). Adverse selection is a phenomenon that happens in many industries, from the car market to the insurance field, from the job market (Spence, 1973) to a technology entrepreneur seeking capital from external investors.

Conversely, moral hazard (Jensen and Meckling, 1976) involves all the two parties' post-contractual opportunistic actions. More precisely, one party (the principal) is not able to monitor all the action that the other party (the agent) is taking (Arrow, 1985). Consequently, the agent can behave opportunistically by bearing more risk or putting in less effort without incurring in any downside as the principal bears the cost of those hidden actions. The underlying cause is the different objective between the agents and principals (Folta and Janey, 2004). Moral Hazard can be observed in the insurance field and the entrepreneurial and external financing one.

4.2.2 Information Asymmetries in the Startups Ecosystem

As previously mentioned in some examples, the asymmetric information problem involves financial markets and, in particular, the founder-investor relationships, which suffer from both adverse selection and moral hazard. The information asymmetries between the two arise both in equity markets (Myers and Majluf, 1984) and debt markets (Stiglitz and Weiss, 1981).

Considering investors, they risk that the founders, once obtained the money, replace low-risk projects with high-risk ones, increasing the likelihood of bankruptcy without counterbalancing this with a higher interests rate (Jensen and Meckling, 1976). Debt funders (e.g., banks) are usually the most affected by the issue. Conversely, agency problems are less intense on the equity side because both founders and equity holders share potential gain.

Considering the entrepreneurs' perspective in detail, new ventures face acute information asymmetries issues for two main reasons. On one side, they have to deal with the so-called "liability of new-comers" or "liability of alienness", i.e., new ventures are surrounded by uncertainty around their product and business model, and it becomes difficult for an external player to properly assess the return that the investment could yield over a long-time period. It is especially true in a technology-intensive business model composed mainly of intangible assets (Kortum and Lerner, 2000; Shane, 2001). Secondly, even though they are state-of-the-art, these assets are not enough to guarantee survival. The commercialisation plan will be crucial for the startups' future because, unfortunately, it requires a complex set of knowledge and resources that they usually lack, and it is uncertain their ability to develop them (Teece, 1986; Deeds and Hill, 1996). Besides, information asymmetries are more acute in the startups' domain than in a traditional entrepreneur-investor relationship. Firstly, they are exacerbated by the innovative element, leading to the "paradox of disclosure" (Arrow, 1962). On one side, the entrepreneurs are often reluctant to reveal their businesses' details due to the risk of proprietary secrets' disclosure (Ueda, 2004). On the other, they have to provide more information to receive funding. Lastly, new entrepreneurs usually lack managerial skills and the ability to convey structured information to investors (Caselli, 2004), and consequently, investors may opt to ration capital.

Therefore, startups face a crucial dilemma in organisation and strategy: how should they gain resources? (Penrose, 1959; Thompson, 1967).

4.2.3 Information Asymmetries and its Consequences for Startups

A firm can build resources via two distinct paths: other firms' acquisition (Ahuja and Katila, 2001) or organic development (Katila and Chen, 2008). However, since acquisitions can be too expensive or unavailable (Graebner and Eisenhardt, 2004) and organic development can be too slow (Eisenhardt and Tabharizi, 1995), inter-organisational relationships, i.e., equity-tie relationships, have become an attractive way for startups to access external knowledge and resources (Deeds et al., 2000). Unfortunately, as previously introduced, the information asymmetries can prevent the parties' agreement. On one side, the entrepreneurs lack the track records, i.e. liability of new-comers, and have limited or negative cash flow, limiting their signalling quality; on the other, investors do not usually find appropriate collaterals to reduce the asymmetry (Brown et al., 2009; Hall, 2002; Carpenter and Petersen, 2002b; Berger and Udell, 1990, 1998; Denis, 2004; Gugler, 2003; de Bettignies, 2008). Such information asymmetry between entrepreneurs and external funders is an intrinsic characteristic of entrepreneurial finance (Wright and Robbie, 1998) and brings several consequences. First of all, it increases the cost of external capital for new ventures. It inflates the funding's marginal costs, which become higher than the internal capital, making the firms financially constrained (Carpenter and Petersen, 2002b; Colombo and Grilli, 2007). It seems that the current financial system is not able to support the NTBF's financial needs, which are under-invested due to the strong market imperfection (Holtz-Eakin, Joulfaian and Rosen, 1994). The founders' difficulties in collecting the needed capital from the outside have a strong negative consequence on their growth, survival, and innovation (Schulman, Cooper, & Brophy, 1993; Harhoff and Korting, 1998; Carpenter and Petersen, 2002b; Hall, 2002, Denis, 2004; Hajivassiliou and Savignac, 2008; Savignac, 2008). Therefore, potentially good ideas or projects may not get funded or get the desired amount of funds (Fluck, Holtz-Eaking and Rosen, 1998), and they could be crowded out from the market or abandon their profitable projects (Stiglitz and Weiss, 1981; Stiglitz, 1985; Bank of England, 2001; Hall, 2002).

4.3 The Solution: VCs as The New Hero

Venture Capitalists come to the entrepreneur's help by providing the so-called smart capital, i.e., financial resources combined with complementary services. Effective smart capital initiatives include services that help ventures design, implement, and manage activities to create and capture value (Gutmann et al., 2019). VCs are particularly suited to invest in risky projects thanks to their specialisation in screening and monitoring, allowing them to better reduce information asymmetries than other investment vehicles (Amit et al., 1998). For these reasons, they are considered the perfect investment vehicle for startups.

4.3.1 Startups Financing Cycle

To better understand the role of venture capitals in financially supporting the startups' world, it is worth deep-diving into the Startup Financing Cycle summarised by Cumming and Johan (2009).

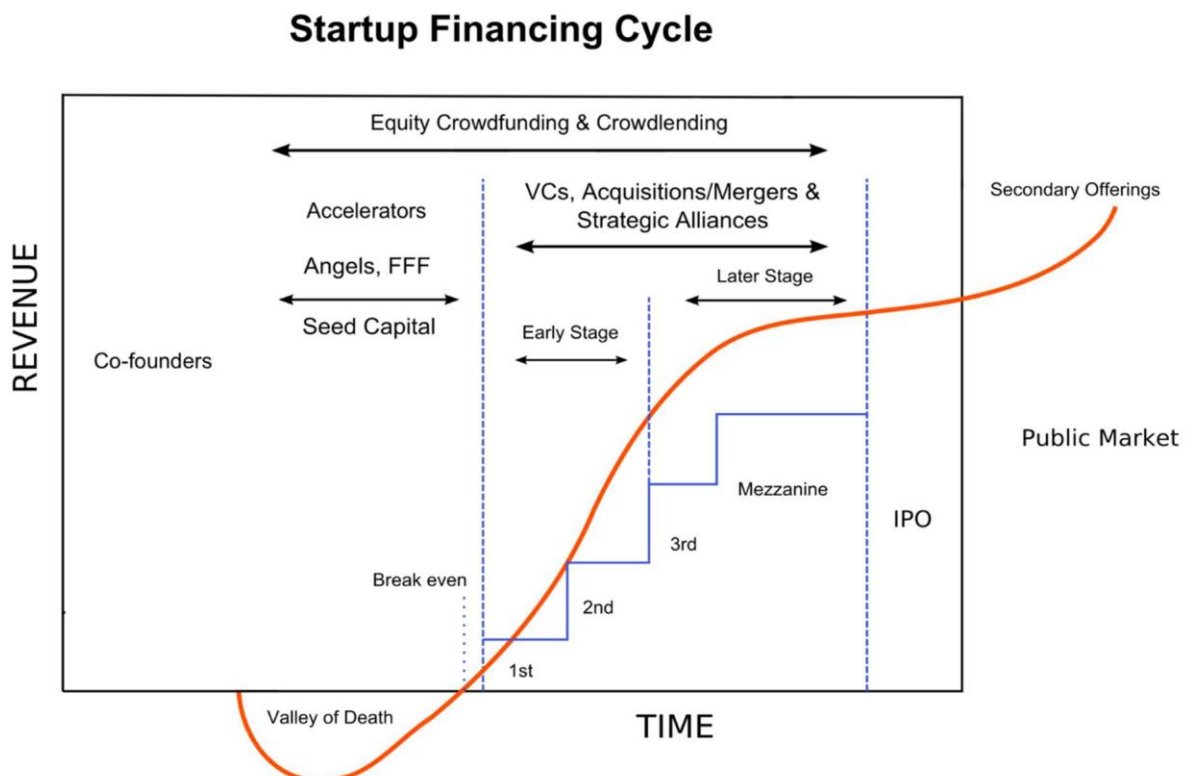


Fig. n. 10 - Cumming and Johan (2009), Startup Financing Cycle

The funding steps divide into seven stages, and each of them snapshots a specific moment in the startup's life concerning revenues and the total funding received. Besides, the actors involved, the activities carried out, and the fundings received are different in each stage and provide an excellent proxy to evaluate the startup's growth and development.

Stage 1: Pre-Seed Financing

Pre-seed is the earliest stage in the startup's life. It is also commonly defined as bootstrapping because, during this phase, founders mainly rely on their own money to grow the business. They can source additional financing from the so-called FFF, i.e., Family, Fools, and Friends, and Early-Stage Venture Funds (Micro VCs), which firmly believe in the project. During this stage, the entrepreneurs are trying to validate their business hypotheses and explore their product feasibility.

In the Pre-Seed stage, the startups in Europe are valued anywhere between 10.000 euro to 100.000 euro and can usually fundraise on average 50.000 euro.

Stage 2: Seed Financing

Around 30% of pre-seed startups fail to reach the next step as they burn all their cash reserves. Liquidity is a critical pain point for the survivors, and seed funding becomes necessary to set up the business properly. More precisely, during this stage, the startup focuses on validating the business model, especially the value proposition and the targeted segment. Entrepreneurs deploy seed funding to cover the go-to-market strategy costs, new employees' salaries, and product-market validation research. In the seed stage, the variety of investors increase. Accelerators and crowdfunding platforms may invest alongside with FFF and Family Angel Investors. However, in this stage, the risk – relatively to the funding required – is higher, and startups have to provide investors with equity to secure their money.

The startups' value can range anywhere between 3 Mn euro to 6 Mn euro in the Seed stage. The funding ticket received can vary from 50.000 euro to 3 Mn euro.

Stage 3: Early Stage-Round A

Few startups overcome the so-called valley of death, i.e., the period in the lifetime in which costs are higher than the revenues and the firms cannot self-finance the operations. Usually, startups that are able to reach the break-even point, develop a working product, and secure a consistent customer base, i.e., problem-solution fit, are on the path to access to early-stage Round A. In this phase, startups strive for the necessary capital to achieve product-market fit and scale the business.

Round A investors are mainly professionals, i.e., angel investors and IVCs, aiming to obtain above-the-average returns. They are not looking for ideas but for a solid strategy and a working business model capable of generating long-term future cash flow.

The average valuation for series A startups can span from 10 Mn euro to 30 Mn euro and raise up to 15 Mn euro.

Stage 4: Early-Stage Round B

In this stage, startups are focused on scaling their business. They are looking for capital to increase their market share by increasing their market reach and expanding their activities with investments in operational teams in marketing, business development and customer success. The final aim is to increase product offerings to serve different segments and cope with the competition.

In this round, the investors are mainly professional and are more specialised in investing in consolidated startups.

Round B valuations range from 30 Mn euro up to 60 Mn euro and can raise around 30 Mn euro.

Stage 5: Later-Stage Round C

Startups entering in round C are on their high-growth path and have developed a less risky operating model. They are looking for additional capital to sustain the expansions by building new products, tapping into new market segments, or acquiring competing but underperforming startups. Therefore, as the business model's uncertainty is close to zero, the series C funding is mainly directed to sustain and unlock all the firms' growth potential (Michaels et al., 1999).

The investors base does not change. It only increases the pool of professional investors willing to secure their shares into successful startups.

Startups can value something from 100 Mn euro to 120 Mn euro and can raise around 50 Mn euro.

Stage 5: Later-Stage Round D (Mezzanine)

It precedes the IPO and must close at a maximum of 12 months before it (Houlihan, 1998). It is not common for startups to undergo this round. Round D financing is usually required to cope with a specific situation, such as reaching targeted growth, i.e., receiving the money to hit the growth objectives defined in round-C but missed, or M&A, i.e., obtaining the proper liquidity and the bargaining power to negotiate.

The investors are usually the same involved as in series C.

The valuations are around 150 Mn euro up to 300 Mn euro and the funding usually raised is approximately 100 Mn euro.

Stage 6: IPO

In this round, the exit event occurs by selling the startup's share to the public equity market for the first time (Houlihan, 1998). The money obtained is deployed to keep the expansion projects going. All the investors participating in the previous rounds who traded money with equity can now recoup their investment and get their return. They can decide to sell their shares right after the quotation or maintain their position as shareholders and sell their stocks later on.

Fundraising determines the startups' future. It represents one of the most important sources of financial resources that new ventures need to operate. Mastering this cycle becomes the top priority for both Investors and entrepreneurs. They should consider each funding stage's different needs to make the most out of their mutual relationship.

4.3.2 VCs Heterogeneity for the Entrepreneurs

However, not all the VCs money is the same for entrepreneurs. More precisely, VCs are heterogeneous, and each typology can offer a different set of complementary services, substantially affecting the new ventures' performances (Hsu, 2006). For example, Independent Venture Capitalists tend to provide more company building services, while on the other hand Captive Venture Capitalists (Government, Corporate, or Bank Venture funds) are more prone to provide company building services (Colombo et al., 2015).

As pointed out by Bengtsson and Wang (2010), entrepreneurs are not blind to this heterogeneity but are particularly sensitive, especially for what concerns practices and value-adding services. More precisely, the authors presented some evidence demonstrating how entrepreneurs can identify the type of venture funds that could benefit them the most. For example, entrepreneurs prefer VCs with a speedy screening process. Due diligence is time- and resources-consuming, and - being financially constrained - funding is often urgently needed. Secondly, entrepreneurs aim at achieving a fit between the VC's expertise and their projects' objectives. Thus, they usually search for venture capital funds specialised in their industry because they can understand the ventures' entrepreneurial process.

On the other hand, geographical proximity, investment stage-fit and financial-fit seem to not be so crucial in the decision. Thirdly, entrepreneurs tend to avoid VC funds that require a massive portion of share mainly because they are afraid of possible internal conflict arising within the VCs' associates; they are less concerned about giving up a more significant slice of shares. Indeed, entrepreneurs tend to select VCs with a strong, predictable, and consistent direction. Lastly, as they select venture capital funds over other forms of financing for their capability to provide operational and strategic guidance, they tend to prefer VCs that are able and willing to be involved in their ventures.

3.3.2 Evaluation criteria: Hints for VCs selection

De Clercq et al. (2006) provide a good summary of what the entrepreneurs should evaluate in order to obtain a fit between them and a VC. According to their study, there are three main factors that they should consider. First, complementary skills. Entrepreneurs have to look for something beyond money (Sapienza, 1992) but should seek knowledge and complementary services. Second, commitment: VCs do not have a legal obligation to provide value-adding services after the investment; therefore, the entrepreneurs should analyse the track record of VCs in terms of post-investment behaviour. Lastly, trusting relationships, i.e., the entrepreneurs should seek VCs with whom it is possible to develop a solid and trustworthy linkage. The entrepreneurial context is highly uncertain, and important decisions may be made quickly, without careful analyses and internal inquiries. Moreover, if performances are not delivered, the VCs have the power to fire entrepreneurs. Therefore, it becomes even more crucial for them to get funds from VCs with a track record of fairness in performance valuation. The network of colleague-entrepreneurs whom they have funded in the past may help in screening.

4.4 Entrepreneurs' Choice: why CVC?

Entrepreneurs have proved to be skilled in evaluating which type of investors to pick up (Tyebjee and Bruno, 1986; Dorf and Byers, 2005; Katila and Cox, 2008). It becomes necessary to deep dive into the determinants considered by startups when entering into an equity tie with a corporate venture fund. It will help understand the pros and cons of the choice that, it

is worth remembering, will have ripple effects on the venture's future performances and development (e.g., Colombo and Murtinu, 2017).

4.4.1 Entrepreneurs' benefits: The Added Value of CVCs

Scholars have suggested that CVCs add value to portfolio firms via different mechanisms rather than other venture funds' typologies (e.g., Gompers & Lerner, 1999; Kann, 2000; Maula, 2001; Maula & Murray, 2001; Dushnitsky and Lenox, 2003, 2006). The several peculiar value-adding activities that attract entrepreneurs to request CVC funding are described in this section.

The first peculiar value-adding service directly connects to the close relationship between the CVCs and their mother corporations. As a direct result of this affiliation, corporate funds can deploy parents' assets and capabilities, i.e., the so-called complementary assets, and help the growth and the development of portfolio companies (Block and MacMillan, 1993; Teece, 1986; Pisano, 1994). Complementary assets involve a wide array of resources and capabilities. More precisely, entrepreneurs can receive support in technology, R&D, product development, manufacturing capacities, marketing and business development resources, and distribution channels (Chesbrough, 2000; Maula et al., 2003b; Dushnitsky and Lenox 2005a; Katila et al., 2008). Access to complementary assets promptly is crucial for the new ventures' performances as it makes the technology commercialisation more efficient (Teece, 1986; Tripas, 1997; Gans et al., 2002).

Secondly, the corporate can provide portfolio companies access to BUs and favour creating cooperative relationships between the two. In other words, the entrepreneurs can find an investor and a potential customer or supplier, which in turn may increase their odds of success.

Thirdly, analysing the potential advantages by adopting the knowledgebase theory, startups can benefit from the relationship in two different ways:

- i) Observe and benchmark with the corporate (Yang, 2012). The CVCs' parents are usually successful and well-established companies; thus, entrepreneurs can learn the best practices directly from them.
- ii) Access to domain-specific knowledge. Parent corporations have a vast amount of knowledge stocks in the industry, technology, and market. CVCs have access to it

and can provide insights and information to the entrepreneurs to plan and execute better (Henricks, 2002).

Lastly, startups suffer from the so-called "liability of newness" or "liability of alienness", meaning that they are not considered trustworthy by the market. Obtaining funding from a well-established corporate is considered a stamp of approval, i.e., an endorsement that brings credibility to these unproven enterprises (McNally, 1997; Stuart et al., 1999; Maula and Murray, 2002). The parents are leaders in their industry, and their presence can provide a signal to other stakeholders and mitigate the possible information asymmetry surrounding the startups (Stuart, Hoang, and Hybels, 1999; Gompers and Lerner, 2000; Maula and Murray, 2002). The reduction of the asymmetries should facilitate the interaction of the NTBFs with suppliers, customers, and all the players with whom they will interact.

4.4.2 Entrepreneur's problem: The Cons of CVC investment

However, alongside the potential benefits, onboarding Corporate Venture Capital investors can entail some risks that the entrepreneurs should carefully consider (e.g., Maula and Murray, 2002). First of all, the funds' organisational structure raises some questions about the CVCs' incentives in supporting the startups. CVCs are not time-bound by limited partners and constrained by covenants; these elements do not ensure that they will maximise their efforts to select and manage portfolio companies (Gompers and Lerner, 1996).

Secondly, entrepreneurs may risk working with low-quality managers as the parent corporation faces difficulties in attracting top-class employees for their funds. The lack of high-powered incentives makes the recruitment and retention of talented investment managers complex (Gompers and Lerner, 2000). Consequently, it undermines the ability to provide high-quality value-adding services to the entrepreneurs compared to IVCs (Dushnitsky and Shapira, 2010; Ivanov and Xie, 2010).

Thirdly, corporate funds tend to suffer from organisational problems due to intraorganizational politics. More precisely, different units compete over the same scarce resources (Sykes, 1990), hindering an effective and efficient provision of the value-adding services.

Lastly, it becomes difficult for startups to develop inter-organisational relationships with different entities other than the corporate itself, even though they can enhance their value

(Ivanov and Xie, 2017). Indeed, CVCs may prevent their portfolio companies from sourcing resources from the open market, especially if it involves developing relationships with the corporate's competitors (Parker and Steensma, 2012).

3.4.2 Swimming with the Sharks Syndrome

If all of the aforementioned organisational complications may hinder the capabilities of delivering value-adding services, the most acute problem for entrepreneurs in starting an equity tie with a corporate investor is the potential conflict of interests arising between them and the corporate, due to similar or competing products and technologies. Being an active investor, the CVCs have access to the entrepreneurs' trade secrets and business strategies and should try to prevent any possible information leakages. However, the CVCs may engage in misappropriation activities (Dushnitsky and Shaver, 2009) such as knowledge and information sharing and technology transfer with the corporate that may jeopardise the startups' success (Hamel, 1991). Indeed, Hellmann (2002) shows that when a CVC unit and a startup compete in the same market, the latter is better off receiving funding from an IVCs.

Katila et al. (2008), to explain the issue better, introduced the concept of "swimming with sharks". More precisely, they leverage on resource dependence theory (Pfeffer and Nowak, 1976) and exchange theory (Emerson, 1962) to analyse the trade-off that that new firms face in entering into an inter-organisational relationship (equity investment) with a CVC (shark).

More precisely, new ventures are resource-constrained on one side, and, therefore, organically building core capabilities and assets take time (Eisenhardt and Tabrizim, 1995); while, on the other, acquiring them is expensive (Graebner and Eisenhardt, 2004). Therefore, entrepreneurs look for inter-organisational relationships as the complementary resources, left idle by the corporations (Penrose, 1959; Pisano, 1990), attract them (Pfeffer and Salancik, 1978; Emerson, 1992; Zaheer et al., 1998).

On the other side, potential threats counterbalance these expected benefits. The CVCs-startups' relationship builds on a fragile equilibrium between cooperation and competition, and the risk that this will break is high (Santos and Eisenhardt, 2008; Brandenburger and Nalebuff, 2011), especially during the equity tie (Das and Teng, 2002). More precisely, if the parents' competitive aim prevails, the entrepreneur can get hurt, i.e., the corporate may be

interested in access to venture resources, such as IP or technologies, and misappropriate them (Doz, 1988; Santos and Eisenhardt, 2008).

For this reason, as the authors have proved, startups decide to swim with sharks only when the benefits outweigh the costs. More precisely, they showed how the startups are more likely to accept CVC funds when:

- i) They are uncertain about accessing financial resources, and thus they look for firms providing smart capital (Pfeffer and Nowak, 1976; Eisenhardt and Schoonhoven, 1996; Gulati, 2007)
- ii) They need complementary core resources (Teece, 1986), especially manufacturing resources, as they are slower to build compared to the marketing ones
- iii) The inventions can easily be protected with secrecy defence and timing (Lerner and Merges, 1998) rather than with patents.

<i>CVC PROS</i>	<i>CVC CONS</i>
Complementary Assets: <ul style="list-style-type: none"> - Manufacturing and marketing capabilities - R&D facilities - Business supports activities - Distribution channels 	Organisational deficiencies: <ul style="list-style-type: none"> - Incentives misalignment - Talent attraction issues - Interorganizational issue
Learning Opportunities: <ul style="list-style-type: none"> - Best practices - Industry/tech knowledge 	Swimming with sharks, i.e., misappropriation risks
Stamp of approval to overcome the liability of newness	

Tab. n.5 – CVCs' Pros and Cons

4.5 The Entrepreneur's Choice: CVC vs IVC

The selection of the investor type is not trivial. Each of them may act with different logics and thus bring different contributions to the ventures (e.g., Bertoni et al., 2015a; Colombo and Murtinu, 2017). One of the entrepreneurs' primary choice is whether to accept funds from a captive investor, i.e., CVCs, or from independent funds, i.e., IVCs.

In the following two paragraphs are presented two studies that shed light on the debate.

4.5.1 Hellmann's (2002) Model

The main differences between selecting a CVC or an IVC is well explained theoretically by the Hellmann's (2002) model.

In this model, the entrepreneur's primary decision-making variable is "expected utility", which is directly influenced by technological complementarities between the new venture and the VC. More precisely, the entrepreneur tries to maximise her utilities by carefully selecting the funds bringing more technological-related complementary benefits. The authors detected three different optimal financial arrangements in the game:

- i) Complementary Technology and Strategic Investor Funding. If the new venture's product is a complement to the corporate's offering, the entrepreneur chooses the strategic investor. The result remains valid even if the strategic investor's support level is below the first-best level, as it is higher than what a venture capitalist would provide.
- ii) Substituting Technology and Independent Investor Funding. The second arrangement happens if the venture's technology is a substitute and/or poses a relatively minor threat to the corporate's core business. In this case, the entrepreneur is better off with venture capital financing. Even though the entrepreneur could extract a higher valuation out of the strategic investor, the independent venture capitalist offers more ex-post support. This result holds out when the strategic investor is equally or less able than a venture capitalist. It frequently continues also to persist even when the strategic investor is more able than the independent counterpart.
- iii) Competing Technology and Syndicated Funding. The third type of financing arises when the new venture poses a considerable threat. In this case, syndicated financing is the optimal option. The venture capitalist is the lead investor, actively supporting the venture and typically holding a board seat. Strategic investors remain passive.

These outcomes are the results of the different actors' strategic choice, and the next part of the paragraph explains the primary rationale behind them.

Firstly, strategic investors, i.e., CVCs, prefer to invest in firms with complementary technologies because they have more incentives to nurture the new ventures. They aim to

extract externalities from the relationship, i.e., improving the parents' product demand via a new venture's complementary offering.

Secondly, complementary technology startups prefer strategic investors as they provide higher expected value than IVC. However, when the technology is marginally competing or a substitute, the externalities are not positive at all for the strategic investor, thus the ex-post incentives to help the venture decrease; besides, since the technology is a substitute, the CVC may not possess all the technical knowledge to support the new ventures. All these elements lead the investee to select independent investors as the best choice. In the third case, when the new venture offering is directly competing with the corporate, the new venture is better off asking for syndicated investments as they can leverage the alignment of the incentives with the leading IVC that may act as a disciplining actor guaranteeing an adequate commitment also from the strategic ones. The startups desire to include strategic investors as they can offer high value-adding contribution due to the level of expertise in the field, but they have to monitor them as they lack the incentives to promote the development of the new venture's competing technology.

Therefore, in the Hellmann's (2002) model, complementarities can determine the incentives in providing value-adding services: according to CVCs ability to provide them, the entrepreneur expected value increases if she decides to enter in the equity relationship.

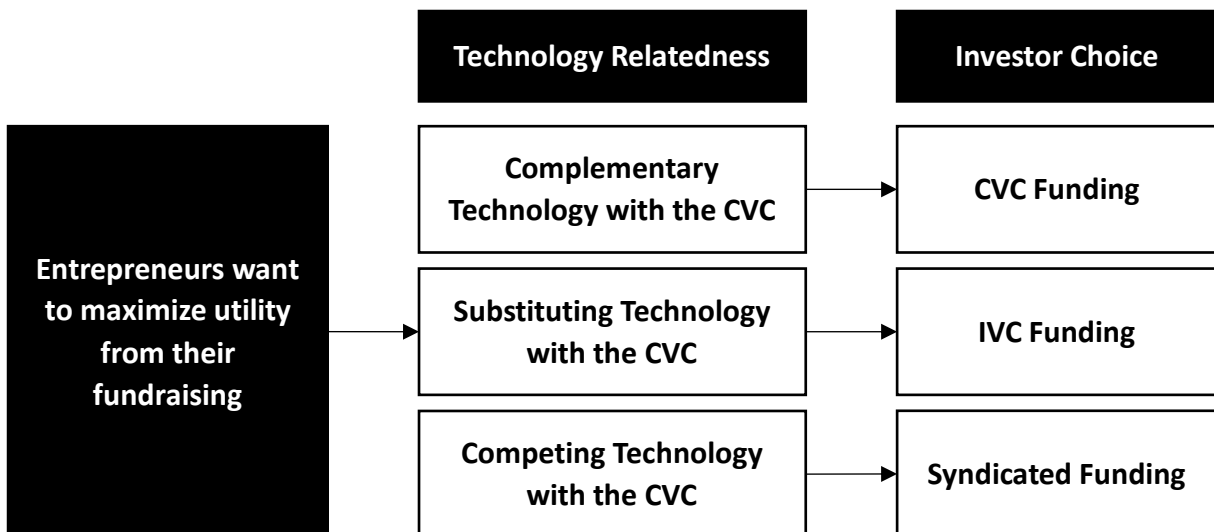


Fig. n.11 – Helmann's (2002) Model

4.5.2 CVCs vs IVCs: Whom They Know and What They Know

The type of value-adding services and the ability to provide them strictly depend on what and whom the venture funds know (Maula et al., 2005). Concerning the former, it underlines that IVC and CVCs have different knowledge bases and capabilities, while the latter refers to the different networks in which they participate, i.e., their different social capital. Maula et al. (2005) analysed their characteristics and found interesting insights.

Starting from IVCs and their social capital, the authors proved that they are more capable of helping the new ventures to:

- i) Attract financing (Maula et al., 2005): IVCs are financial professionals who seek new investment opportunities by cultivating a broad network in the financial market which includes investment bankers or other venture capitalists
- ii) Recruit employees such as executives (Gorman and Sahlman, 1989; Rosenstein et al., 1993; Sapienza et al., 1996; Hellmann and Puri, 2002): IVCs set challenging objectives for the investee firms, and sometimes these performance expectations require the hiring of new experienced managers. Therefore, IVCs have developed a network of professionals as a pool for sourcing candidates to appoint in their portfolio firms.

According to IVCs' knowledge, their main contribution is to help startups set up the organisational structure (Maula et al., 2005). IVCs final aim is to guide the startup to the exit phenomenon and develop the ability to support entrepreneurs in organising their firms at each stage of their development (Hellman and Puri, 2002). These are all activities related to company building, i.e., the provision of tools necessary to create the company's infrastructure. On the other hand, moving to the CVCs domain, they leverage their social capital to attract customers, both national and international better. More precisely, new ventures suffer from the "liability of alienness" that stick them in a chicken-egg problem: consumers do not want to buy a product without a proven track record, but simultaneously, startups cannot develop a track record if no one buys from them (Burgel et al., 2001). Entering in an equity tie with a CVC has proved to resolve this impasse by:

- i) Letting the new firms exploit the corporate's marketing and distribution resources (Maula, 2001),
- ii) Acting like a signal of quality for the new ventures (Maula, 2001; Stuart et., 1999).

Concerning CVCs' knowledge side, corporate funds usually originate from corporations operating in technology-intensive industries and can leverage their deep technical competencies for supporting startups. Being strategic investors, CVCs have demonstrated their willingness to provide this knowledge to portfolio firms. Knowledge exchange is a powerful tool that enhances the likelihood of tapping into the new ventures' innovations and adding strategic value to the corporate (e.g., Sykes, 1990; McNally, 1997; Kann, 2002; Ernst & Young, 2002; Keil, 2002). Besides, CVCs have the resources and the capabilities to provide in-depth technology due diligence on technological innovation or new applications in their areas of competences (Corporate Executive Board, 2002; Earnest & Young, 2002). These activities aim to nurture the new ventures, i.e., to provide them with support in growing the core product.

	WHOM	WHAT
IVC	<i>Attracting Financing</i>	<i>Internal Organization Set up</i>
	<i>Recruiting Key Employees</i>	<i>Company Building Activities</i>
CVC	<i>Attracting Customers</i>	<i>Technological Due Diligence</i>
	<i>Attracting Suppliers</i>	<i>Company Nurturing Activities</i>

Tab n. 6 – Maula et al., (2005), CVCs vs IVCs

4.6 Explaining the Entrepreneurs' Choice: Theoretical Models

Entrepreneurs face a set of trade-offs (e.g., misappropriation risk vs access to complementary assets) when starting an equity relationship with a CVC. These trade-offs are strictly dependent on several factors that will determine the ventures' performances and, as a consequence, will affect their success probability. Scholars have developed econometrics models to explain the rationale behind the entrepreneurs' choice to enter an equity-tie with a corporate fund.

4.6.1 Commercialisation strategy: Competition vs Cooperation with the CVC's corporate

In their study, Gans and Stern (2003) showed how the first element of inquiries that the entrepreneurs should ask themselves is related to commercialisation strategy, i.e., whether they can translate promising technologies into a financial stream for founders, investors, and

employees. Commercialisation represents the first opportunity for a startup to define strategy and positioning. Being financially constrained, startups can only pursue a few strategic options without losing effectiveness in delivering value to customers (Veugelers and Cassiman, 1999; Bhide, 2003).

More specifically, concerning commercialisation, the authors identified two primary strategies identified:

- i) Competition: independent entry and commercialisation in the product market
- ii) Cooperation: commercial agreement with incumbents to enter the market

Considering that switching between the two commercialisation strategies implies some costs and that startups can simultaneously select a limited number of strategic options, new ventures usually have to define ex-ante whether they should compete or cooperate in the product market with incumbent firms. The decision will directly depend on a careful costs-benefits analysis.

In competition, the startup decides to profit from innovation through the product market, and its success depends on several factors. First, they need to acquire all the necessary capabilities and complementary assets to deliver a meaningful proposition to the customers. Secondly, they should be ready to cope with aggressive price competition and avoid technology imitation against incumbents. The entrepreneurs should understand whether they are in an environment where the incumbents are unable to organise and market new technological opportunities; in other words, if they are susceptible to disruption (Foster, 1986; Henderson and Clark, 1990; Christensen, 1997). It is essential not to be detected and avoid a competitive reaction and at the same time, be ready to undertake aggressive investment, manage uncertainty, and focus the scarce resources in possession to develop a meaningful value proposition.

Concerning the cooperation choice, the startup decides to profit from innovation through the market for ideas, i.e., profit through agreements with other incumbents commercialising the technology in the product market. Even though these cooperation agreements can take different forms, they all lead to a reduction of downstream competition and limit the startups' investment in downstream commercialisation, i.e., they allow the entrepreneur to avoid sunk costs in complementary assets for commercialisation (Teece, 1986). However, the cooperation strategy accentuates the "disclosure paradox" (Arrow, 1962; Anton and Yao,

1994) as it increases the entrepreneur's exposure to misappropriation risk. The factors that determine the magnitude of the risk mentioned above are two.

- i) Intellectual property protection concerning the technology
- ii) The ability to find new attractive partners.

Both of them provide the startup with bargain power and greater capability to defend its innovation from the incumbent's misbehaviour. Consequently, they mitigate the paradox nudging the entrepreneur to disclosure.

The entrepreneurs decide to either compete or cooperate according to the environment in which they operate. In particular, the variables considered are two.

- i) Excludability, i.e., different mechanisms to protect the innovation from the incumbents. It can involve formal mechanisms (e.g., patents) or informal (e.g., lead time and the incumbents' reputation). The former represents a considerable bargain weapon favouring cooperation. On the other hand, lead time, timing, or delaying the incumbents' new-technology-detection provide an advantage to compete directly in the market.
- ii) Complementary assets, i.e., the additional core resources needed by the entrepreneur to grow its business. These assets represent the central wedge between corporates and startups. If the latter cannot acquire them cost-effectively, they will face difficulties in competing, especially when the amount needed is high and the sunk costs become substantial. Timing is also a crucial factor when considering investments in complementary assets and may turn out to be a double-edged sword. More precisely, on the one hand, a later stage cooperation agreement can be a cheap alternative to IPR as it prevents the corporate to influence a more developed and visible technology (Sahlman, 1990; Rivkin, 2005). On the other, if cooperation starts too late and the entrepreneurs may have already incurred in substantial sunk costs, timing may reduce the possible return through cooperation and thus favour competition.

4.6.2 Park and Steensma (2012) - The role of Assets Complementarity and Environment's Characteristics

Park and Steensma (2012) built on the Hellmann's (2002) model - that leveraged solely on the concepts of assets complementarity - and have added environmental characteristics to explain the rationale of entering in an equity tie with CVCs. More precisely, they adopted the Transaction Logic Theory (Williamson, 1985) to explain how assets complementarity and environmental uncertainty might affect new ventures' choice.

Assets Specificity

Transaction costs include expenses related to search, negotiation, and contract monitoring. The reduction of these costs can usually improve the firms' performance. One of the main factors influencing transaction costs' magnitude is assets specificity (Williamson, 1985, 1991; David and Han, 2004), and complementary assets can vary a lot in this dimension. More precisely, it is possible to define two extremes: specialised complementary assets, i.e., assets tailored for a specific use and generic complementary, i.e., assets re-deployable for alternative uses without altering their value (Teece, 1986). As previously mentioned, new ventures may face difficulties in internally developing these assets in the short-run (Aghion and Tirole, 1994) or getting them from the open market, especially if suppliers need to undertake relationship-specific investments with a low terminal value. It follows that established firms are reluctant to provide specialised assets to new ventures based on an arm's-length market relationship without imposing any downside protection such as penalty clauses or monitoring mechanisms (Williamson, 1985, 1991).

One way to mitigate these bargaining problems is through equity funding. Equity ownership provides control mechanisms for the established firms to exercise if new ventures behave opportunistically (Williamson, 1988). Moreover, they represent an incentive for the incumbents to provide complementary assets, mainly if these contribute to the new ventures' success (Grossman and Hart, 1986; Hart and Moore, 1990). Consequently, entrepreneurs who require specialised assets for their business can obtain them more effectively from corporates having an equity stake in them. On the other side, the transaction costs incurred to secure general complementary assets is lower in the open market than in an equity tie. Their residual value remains high even if the deal should eventually fail (Williamson, 1985, 1991; Pisano, 1990; Rothaermel and Hill, 2005), and, as a result, entrepreneurs would be better off working

with different providers to increase their bargaining in power vis-à-vis with corporate investors.

Park and Steensma (2012) confirmed this interplay between complementary assets specificity and the equity tie formation by demonstrating how a CVC is more beneficial to startups requiring more specialised assets rather than generic ones.

Environmental Uncertainty

The second factor affecting transaction costs between the two parties is environmental uncertainty. According to the transaction costs logic, when uncertainty is low, the tendency to outsource activities increases as contracts are consistent, limiting contractual hazards. In contrast, when the uncertainty is high, contracts become unreliable, and the firms tend to internalise more activities (Williamson, 1985, 1991).

Therefore, when the market development is uncertain, a new venture is not able to estimate its future resource needs and obtaining complementary assets from the open market may lead to high transaction costs related to constant contract updates (Williamson, 1985, 1991). On the other hand, corporates may be reluctant to provide complementary assets as incomplete contracts expose them to contractual hazards. The establishment of interfirm equity relationships can represent an efficient solution for both parties. The corporates protect themselves from ex-post opportunistic behaviour. Startups ensure that the partner provides complementary assets efficiently (Williamson, 1985, 1988) as it will be more flexible and willing to make necessary changes compared to suppliers with no equity stakes.

In contrast, when the uncertainty is low, new ventures can predict their resource needs, and established firms will be less reluctant to provide complementary assets in arm's length relationships. Writing contract becomes more feasible, and equity ownership is no longer a fundamental safeguard.

Indeed, Park and Steensma (2012) provided empirical evidence demonstrating how assets complementary and environmental uncertainty interplay to determine the equity-tie formation between corporate funds and startups. More precisely, they showed that when the uncertainty is high, CVC-funded new ventures are advantaged compared to other peers thanks to the corporate's steady supply of assets. In a low uncertainty case, new ventures are better off sourcing complementary assets in the competitive market, which grants them higher bargaining power.

<i>Tie-formation Variables</i>	<i>Paper</i>	<i>Intensity</i>	<i>Rationale</i>
<i>Excludability</i>	Gans and Stern (2003)	High	Protection mechanisms decrease misappropriations risks
<i>Complementary Assets</i>	Gans and Stern (2003)	High	Startups need in a timely fashion core resources
<i>Asset Specificity</i>	Park and Steensma (2012)	High	Highly specific assets are costly in the open market
<i>Environmental Uncertainty</i>	Park and Steensma (2012)	High	Contracting in the open market become costly

Tab. n.7 – Tie Formation Variables

4.6.3 Guo et al. (2015) - The CVC's Impact on Startups' Success

Gou et al. (2015) developed a theoretical model to explain better the positive impact of the CVC on the startup's success, i.e., the exit event. Planning the exit strategy is an essential step for entrepreneurs who can choose between two main options: Initial Public Offering (IPO) and acquisition. IPO consists of listing the firm's shares in the stock market. It enables to obtain additional financing and allows insiders to sell their shares to the public. It is usually costlier for the firm, but it guarantees competitive advantages, i.e., the new shareholders have a relatively little bargaining power. In an acquisition, another company acquires the startup. It immediately allows to cash-in money for the shares, but the entrepreneurs may have to bargain with a new powerful shareholder (Zingales, 1995; Bayar and Chemmanur, 2011).

Startups face different trade-offs in selecting the optimal exit route, and the choice depends on several factors:

- i) The expected profitability of the venture
- ii) The level of uncertainty
- iii) The information asymmetry between insiders and outsiders
- iv) Possible conflicts between insiders
- v) Financial market conditions
- vi) Investor type.

Among these, the authors deep dive into the last one, i.e., they analyse the investor type's role in entrepreneurs' fundraising decision. Accepting funds from a specific investor (e.g., CVC over IVC) has profound implication during the deal cycle as it affects the extent of information asymmetries and potential conflicts between insiders and outsiders. Nevertheless, most importantly, it influences the exit strategy.

From these elements, Guo et al. (2015) assumed that whether or not the startups receive funds from a Corporate Venture Capital can be crucial for its success. In their analysis, the authors developed a model accounting for three of the main elements characterising a startup investment:

- i) High uncertainty
- ii) Information asymmetries between insiders and outsiders
- iii) Investors' different discount rates.

The interaction of these three elements will determine:

- i) Investment level
- ii) Investment duration
- iii) exit strategy.

More precisely, the investment level is supposed to increase the startups' expected value, enhancing the probability of a higher return on the investment. An increase in duration will decrease the information asymmetries between insiders and outsiders as the market gains time to gather data about the startups, i.e., outsiders get more informed about their success probability (Felix et al., 2014). Concerning the exit, the situation is more complex. If there are no information asymmetries, and all the investors know the startups' value, only the more profitable startups will undergo IPO. Indeed, they would be the only ones to receive an offer that covers the IPO costs. However, due to information asymmetries, the insiders have more knowledge than external investors. The profitability and the probability of success cannot be observed, and for this reason, cannot be taken for granted in determining the exit choice. To solve this issue, the outsiders can try to estimate the probability of success, which would become the primary decision variable. More precisely, it will become the parameter adopted to compute the new ventures' expected value. Assuming that the IPO and acquisition's valuation and costs are independent of the acquirers' information, the deal price (the expected value) is computed by multiplying the company's value with the estimated

probability of success. It is worth noting that, due to adverse selection issues, promising startups tend to receive worse valuation relatively to bad ones.

Consequently, there will be an expected value equilibrium where the startups are indifferent about IPO and acquisition. The more the investors are informed, the more they are able to provide a valuation aligned with the startups' real value. Thus, in the equilibrium case, the number of startups undergoing IPO decreases. It follows that the investment duration leads to a decrease in the IPO rate's likelihood as the investors have more time to become more informed. On the other hand, less-informed investors tend to award higher investment levels (relative to the real startup value), which, as previously mentioned, tend to increase the overall value of the company. The increase in value should lead to a higher success rate and a higher IPO rate.

To better discern the CVCs impact in terms of exit strategy compared to IVCs, the authors considered the cost of capital as the main variable. Low cost of capital characterises CVC and leads to the following implications:

- i) CVCs apply a lower discount rate on their funds and thus tend to award higher valuation than IVCs
- ii) CVCs are less time-constrained and thus tend to invest for a more extended period than IVCs.

These two effects are in contraposition. The former will tend to increase the likelihood of an IPO as it will increase the startups' value, while the latter acts as a deterrent to IPO as it reduces the information asymmetries. Therefore, the two's relative strength will determine the exit route of the startups when funded by CVCs. It is probably the typically short life span of CVC programs that have led to several empirical findings underlining the increase of likelihood of IPO for CVC-backed startups (e.g., Gompers and Lerner, 2000; Gompers 2002; Ivanov and Xie, 2010).

4.7 Why It Is so Difficult Opting for the Cooperation Choice

The paradox of disclosure introduced by Arrow (1962) can be easily seen in the equity tie relationship between the CVC and the new ventures. The latter tries to signal quality to the investor (Bhattacharya and Ritter, 1983; Anton and Yao, 1994, 2002, 2005) to reduce the adverse selection issue (Coff, 1999), but on the other side cannot reveal too much information

upfront. Indeed, the CVC represents a threat as it can steal the new ventures' technology. The disclosure issues are even more acute when the two parties may compete in the same market, increasing the corporate side's incentives of misappropriation.

4.7.1 Dushnitsky and Shaver (2009) - The CVC Paradox

Dushnitsky and Shaver (2009) coined the so-called "CVC Paradox" to describe the difficulties in the CVC-startup dyadic relationship. The authors investigated the factors determining the intensity of the paradox, namely:

- i) Industry
- ii) IP regime.

Concerning the industry, the equity relationship is highly sensitive to the overlapping between the new venture's and CVC parent's business. More precisely, when both parties' technologies are in the same industry, they are potentially in competition, and the independent entrance of the new firms can impact corporate profits. Consequently, the corporate will be more prone to intervene to offset the loss from an independent entrance via CVC funding. Conversely, different scenarios happen when the new venture sells its technology in a diverse industry than the parent. More precisely, when the industries are unrelated, the new venture's activities will not affect the corporate business; in the case when the two are complementary, new venture initiatives can have a positive effect on the corporate business (Brandenburger and Nalebuff, 1996; Ander, 2006). In both cases, the corporate is less concerned about an independent entrance.

The authors deepened their study by analysing the interplay between industry relatedness and knowledge. More precisely, technologies coming from related markets and industries should be easier to learn for a given organisation. Indeed, a firms' absorptive capacity (Cohen and Levinthal, 1990; Pisano, 1991; Veugelers, 1997), i.e., the ability to absorb knowledge from outside, increases when there is a substantial similarity between domains (Lane and Lubatkin, 1998; Ahuja and Katila 2001). It follows that, in the case of industry relatedness, the CVC will be more able to transfer the technology to the corporate and, on the other side, thanks to the deep knowledge of the industry, technology, and market, it can provide higher-quality technical and commercial contributions to the startups. Therefore, the entrepreneurs face a trade-off between the desire to tap into domain-specific competencies and the risk of

misappropriation: when strong technological links exist, the risks can be extremely high, preventing the formation of the dyadic relationship (Kim et al., 2019).

In this case, the entrepreneur's decision may change when an effective IP regime is active as it can ex-ante guarantee the relationship's safety. It is reasonable to assume that, with such protection, entrepreneurs may be willing to get funded by same-industry CVCs. They can enjoy the superior support provided and obtain higher expected profits. The opposite happens when the IPP regime is low, and the industry relatedness is high. The high risk of misappropriation influences the ex-ante trade-off and prevents startups from entering into an agreement with the corporate fund.

It is possible to conclude that entrepreneurs have to evaluate the legal environment surrounding their technologies. If the IPP regime is strong, they can obtain the most out of an equity tie relationship by entering in an agreement with same-industry CVCs.

4.7.2 CVC Paradox: The European Case

The thesis focuses on pan-European startups, and, therefore, it is worth mentioning the study of Colombo and Shafi (2016) highlighting geographical differences in the CVC Paradox between Europe and the US. More precisely, although the IPP regime is of similar strength in both countries, the VC market is different, leading to several implications.

First of all, the wedge between the European and the US VC markets mainly relates to the hostile European legal environment. The most acute deficiencies involve lower protections for investors (La Porta et al., 2002), greater safeguards to lenders discouraging equity holders (Armour and Cumming, 2006), and a rigid market regulation deterring early-stage investments (Jeng and Wells, 2000). Besides, the European stock market is less developed, and VCs have more difficulties in generating successful exit (Black and Gilson, 1998; Jeng and Wells, 2000). Lastly, in Europe, VC investment does not find the support of the Cognitive Institutions, i.e., the culture of a society. More precisely, the EU's most significant differences with the US include entrepreneurs' lower social status (Bruton et al., 2005), a greater propensity to avoid uncertainty, and a greater inclination to collectivism as opposed to individualism (Li and Zahra, 2012).

As a result, European IVCs are less mature and more inexperienced than in the US, and for this reason, they are not able to provide the complementary assets required by early-stage

startups (Bruton et al., 2005). It also follows that when the IPP regime is strong, entrepreneurs have no option other than to enter in an equity relationship with same-industry CVCs. However, to cope with this market deficiency, European players leveraged on an alternative mechanism such as trust. Trust guarantees a safe tie formation for both entrepreneurs and CVCs, limiting the former's high risk of misappropriation and reducing the latter's adverse selection issues.

Colombo and Shafi (2015) deep dive into the mechanism influencing the dyad's initial trust formation by leveraging on two different theories: rational theory, i.e., trust forms after a cost-benefit analysis by the actors (Coleman, 1990), and the relational theory, i.e., trust develops by social interactions between the actors (e.g., Kramer et al. 1996; Mayer et al., 1995). Under these theories, two types of trusts can form:

- i) Institutional trust. Institutions generate this trust by sanctioning and monitoring those who misbehave. The institution can be formal, i.e., law and IPP, and informal, i.e., reputation/social capital (Bachman and Inkpen, 2011)
- ii) Cognitive trust. This trust includes all the information regarding a trustee's membership in a social category which conveys indirect information on the individual's trustworthiness (Kramer, 1999). More precisely, status (Podolny, 2005), which slowly builds on social collaborations (Blau, 1968), and stereotype, generates this trust's type, and they both connected to nation-societal cultures and organisational trust.

As seen before, in Europe, institutional trust (law and IPP) does not effectively increase the likelihood of starting a collaboration. On one side, formal institutions are not a determining factor in an underdeveloped VC sector (Colombo and Shafi, 2016); secondly, informal institutions are not as effective: the EU VC market is too fragmented to guarantee that reputation is a reliable proxy for trust (Bertoni et al., 2015a) as happens in the US (Hallen et al., 2014).

Conversely, evidence proved cognitive trust to be effective in increasing the likelihood of collaboration. It is worth noting that it is composed of status, i.e., a mix of rational and relational trust, and stereotypes, which are solely relational as they rely on rules of thumbs, i.e., heuristics (McEvily et al., 2003). The relational component is predominant in cognitive trust, suggesting that practitioners should engage more in mutual tasks rather than self-

protecting themselves to favour the development of new relationships (Colombo and Shafi, 2016).

This thesis seems to be supported by Kim et al. (2019), where the authors identified direct ties, i.e., interactions between CVCs and founders, to be more effective in determining the relationship formation, rather than the indirect ones, i.e., acknowledging the CVC's opportunistic tendencies via the lead investor, usually an IVC.

4.7.3 Social Defences: An Alternative Mechanism to Swimming with the Sharks

The literature has found different mechanisms permitting the entrepreneurs to defend themselves from the risk of entering into an equity tie with a corporate investor. For example, the development of a solid business model (Alvarez and Barney, 2001) or a strong IPP regime may help to reduce the misappropriation risk (Kann, 2002). However, once entered into an equity tie, the startups should also find a different mechanism to develop a solid relationship. Hallen et al. (2014) tackled the issue by investigating the role played by social defences as a mechanism to swim with "sharks", i.e., corporate venture capital. They leveraged on the network theory to examine third parties' ability to improve trust in a relationship and reduce the misappropriation risk (Bae and Gargiulo, 2004; Burt, 2005). Third parties are not directly related to the dyad CVC-startup, and their influence is just a by-product of the network structure (Gulati, 1995a; Li et al., 2008). Therefore, social defences are a powerful tool for young firms that have yet to develop trust. The most important third parties for startups are independent venture capitalists: the ideal partner having incentives aligned with the startups' ones (Amit et al., 1998).

More precisely, the authors investigated the impact of two social defence mechanisms, disciplining and aligning, that the IVCs can deploy for the portfolio firms.

Disciplining

Concerning disciplining, third parties can deter opportunistic behaviour and discipline one actor, leveraging on to their social power. They can undertake two different reputational threats (Raub and Weesie, 1990). First, partners can terminate current ties or avoid future ties with the misbehaving party (Ahuja, 2000a; Burt, 2005); secondly, the third party can broadcast allegations of opportunistic behaviour damaging the party's reputation (Gulati, 1995b; Soda, Usai and Zaheer, 2004). Translating everything in the venture capital words, it becomes crucial

for young firms to enter in a relationship with IVCs occupying a central position in their network. Centrality depends on the extent to which the IVC connects to well-connected others (Bonacich, 1987). It is considered a good proxy for quality and high performances. Central IVCs select only high-quality firms and, therefore, entering in their ecosystem acts as a stamp of approval (Podolny, 1993; Pollock & Gulati, 2007, Hallen 2008; Pollock, Chen, Jackson, & Hambrick, 2010). Besides, central players are more able to broadcast misbehaviour: they are a credible and noteworthy source of information (Benjamin and Podolny, 1999) and can spread the information easily (Gulati and Gargiulo, 1999; Podolny, 2001). Indeed, IVCs usually develop a reputation of toughness (Agarwal et al., 2004) as they tend to tarnish misbehaving parties' reputation. More precisely, their objectives are linked to the startups' performances; thus, they have more incentives to guarantee discipline for all the actors involved. From these assumptions, Hallen et al. (2014) confirmed the centrality effectiveness, which proved to be a substitute defence mechanism when other defences are not available.

Aligning

The second mechanism is alignment, i.e., the third party helps the new firm select the right partner. The capability of suggesting the right partner is directly related to the frequency of interaction between the new firms and the third party. In other words, the more the startups interact with their VCs, the better the VCs are able to understand what the firms need and thus provide suitable suggestions (Gulati, 1995 b; Sorenson and Stuart, 2001). The level of interaction depends on geographical proximity (Sapienza and Gupta, 1994) as the closer VC, the more they are engaged (Lee Pollock and Jin, 2011; Sorenson and Stuart, 2001).

However, Hallen et al. (2014) provide evidence that these assumptions may be wrong. Contrary to common belief, proximity seems to offset the benefits coming from centrality in determining social defence.

To sum up, the authors suggest that, to swim with sharks, the startup has to develop relationships with central IVCs rather than with proximate ones, thanks to their discipline role.

4.7.3.1 Geographical differences

It is essential to recall the study of Colombo and Shafi (2016) and consider geographical differences that can alter the social defences' impact. When the VC market is immature, entrepreneurs have few options other than entering into agreements with CVCs. It is reasonable to assume that although immature, VCs can still play a disciplining role in the market and cope with the potential absence of a strong IPR regime. However, Hallen et al.

(2014), after controlling the VC's maturity, proved that social defence via IVCs, in this market, is not a substitute mechanism but only a reinforcing one. Indeed, it complements formal mechanisms leading to an increase in the likelihood of same-industry CVC-startup ties. The reason is connected to the low density of the VCs network. Being an immature market, the network is not well developed and makes the disciplining actions less effective.

4.7.4 Hierarchy on Tie Formation

The study from Katila et al. (2008) provides evidence of hierarchies' existence concerning defence mechanisms and complementary assets for both the corporate and the entrepreneurs. More precisely, from an equity tie, both the corporate and entrepreneurs should find favourable conditions concerning complementary assets and defence mechanisms. Complementary resources are those assets the CVCs offer to the startups, i.e., cooperation factors; defence mechanisms are the instruments the entrepreneurs can leverage to defend their innovation, i.e., competition factors. Concerning the complementary assets, the authors found that cash is king: entrepreneurs consider money the most important element determining whether to enter an equity tie relationship or not. Financial resources are flexible and do not involve any disclosure. Alongside with them, entrepreneurs are interested in manufacturing capabilities that are the most critical assets to develop. It underlines that a financial-based relationship is not enough for both sides: corporates want to have access to the new technology, and startups need the manufacturing capabilities, which are usually slow and costly to build. Marketing represents the least needed ones. They are usually cheap and readily available through other non-equity agreements such as revenue-sharing.

Concerning the defence mechanisms, hierarchies exist too. Timing and trade secret seems to be the most preferred rather than formal IPR. Timing, if startups have not incurred in high sunk costs related to competition (Gans and Stern, 2003), is a cheap alternative compared to legal costs. It has a broad range of application since the protection is path-dependent, i.e., the technology can be less influenced over time as it becomes more visible, developed, and robust (Sahlman, 1990; Rivkin, 2000). Besides, in later stages, the likelihood of having IVCs in the cap table increases, and they can prevent CVCs to misbehave. On the corporates side, time can reduce information asymmetries of the startups' real value and help them make sound

decisions. Conversely, IPRs discourage CVCs as they prefer to have easier access to technology (Dushnitsky and Lenox, 2005a). Lastly, trade secrets are a weaker protection than patents and provide more incentives for the venture capitalist to invests (Scotchmer, 2004).

Starting from these assumptions, the authors showed how the equity-tie relationship forms when both the competitive factors (defence mechanism) and cooperative factors (resources) match. More precisely, when the corporate is able to provide outsized financial and manufacturing resources and when defence mechanisms other than patent protection are in place.

Chapter 4 - part 2

Empirical Evidence on CVCs Impact

After a careful analysis of the theoretical background, it is necessary to deep dive into the empirics to double-check the pros and cons of starting an equity relationship with a CVC. Several theoretical studies have a contrasting view concerning the positive impact a corporate investor may have on the investee firm. On one side, CVCs may provide complementary assets (e.g., Block and MacMillan, 1993), access to distribution channels (Chesbrough, 2000), open up a new collaboration with the corporate's BUs and partners (Ivanov and Xie, 2017) and provide legitimacy to overcome the liability of alienness (e.g., McNally, 1997). On the other side, entrepreneurs suffer from several drawbacks. First of all, the organisational structure of CVCs is not suited for financing young and risky ventures. More precisely, they do not offer outcome-based compensation schemes necessary to attract and retain top employees (Gompers and Lerner, 2000) and do not have covenants with Limited Partners that induce them to put maximum efforts in screening and monitoring portfolio companies (Gompers and Lerner, 1996). Secondly, the CVCs' objectives may be not aligned with the startups' ones. Being strategic investors, corporate funds prioritise the corporate's goals rather than focusing on the portfolio firms' ones (e.g., Zu Knyphausen-Aufseß, 2010). Strictly related to this are the misappropriation risks that the entrepreneurs face when working closely with a corporate partner. Especially if the technological links are strong, i.e., the dyad operates in the same industry, the CVCs may transfer the startups' proprietary knowledge or technology to the parent (e.g., Katila et al., 2008). The likelihood of misappropriation changes according to:

- i) Formal and informal IPR protection (Dushnitsky and Shaver, 2009)
- ii) VC capital market maturity, i.e., the IVCs are mature enough to support the financing needs of new ventures (Colombo et al., 2016)

- iii) The relatedness between the CVCs' and investee firms' business, i.e., if the two develop competing or complementary technologies and whether they sell them in the same market (Parker and Steensma, 2012)
- iv) Other contingencies such as the founder presence may increase the principal-principal problems and hinder the relationships' benefit.

Summing up the Theory via Institutional Logic

It is worth understanding the ambiguous impact that CVCs have on startups by adopting the institutional logic theory. Accordingly, the perception of what is considered proper, rational, and necessary, shapes organisations and their individuals' actions (Tolbert et al., 2011). Different institutional logics become visible thanks to three different norms, i.e., attributes that fit together coherently and make the logic apparent (Glynn, 2000), namely:

- i) Basis of norms, i.e., rules about membership, authority, and legitimacy (Thornton, Ocasio, and Lounsbury, 2012)
- ii) Basis of strategy, i.e., how individuals within the organisation perceive their identity and strengths (Ocasio, 1997; Glynn, 2008)
- iii) Basis of attention, i.e., all the assumptions that individuals make, such as how to succeed or which elements require more attention.

Concerning the CVC specific case, in terms of the basis of norms, CVCs have dispersed authority (CVCs vs parent authority), complex and slow processes (centralised resources development), and suffer from inter-organisational conflicts that make it difficult to access to valuable slack resources (Pahnke et al., 2015).

Considering the basis of strategy, CVCs see themselves as a scout of new technologies and broker between new ventures and business units (Wadhwa and Kotha, 2006; Hallen, Katila, and Rosenberger, 2014). However, at the same time, they need to reassure the new firms about the misappropriation risks (Katila et al., 2008) by approaching the deal with a more arms-length relationship and thus increasing the difficulties in understanding the correct needs of the firms. These elements underline the existence of a trade-off concerning the basis of strategy.

Finally, concerning the basis of attention, CVCs pose attention to both strategic and financial objectives, so they are a more patient capital that on one side guarantees the development of the technology and, on the other, hinders its effective commercialisation (Pahnke et al., 2015).

To conclude, the different bases present contrasting forces, and they underline the difficulties to reach an agreement regarding the CVCs' impact on the portfolio companies leveraging solely on the theoretical side. It is essential to look at the results coming from the empirics to navigate through the debate. Scholars have investigated the value-added contributions by adopting different angles, summarised as follow:

- i) Ventures' innovation performance (e.g., Alvarez-Garrido and Dushnitsky, 2016), i.e., whether the CVCs decrease or increase the innovation output of the portfolio firms
- ii) Ventures' financial performances (e.g., Colombo and Murtinu, 2017), i.e., the impact of CVCs on portfolio firms financial KPIs such as Overall Economic Performances (Colombo and Murtinu, 2017) or sales' growth (Chemmanur and Loutskina, 2008; Chemmanur et al., 2011)
- iii) Ventures' success rate (e.g., Chemmanur and Loutskina, 2008; Dushnitsky and Shapira, 2010; Yang, 2012; Guo et al., 2015), i.e., whether the exit rate – via acquisition or IPO - of the CVCs funded startups increases or decreases compared to other investors.

The following paragraphs will discuss each point by exploring the most representative empirical studies on the topic.

4.8.1 Evidence on Value Adding services

Concerning value-adding services, empirics seem to match what the theoretical analysis has previously introduced: CVCs' are more able to deliver specific value-adding activities better than other funds. Evidence showed that startups benefit from the corporate's endorsement, which advertises them and increases their market credibility by acting as a stamp of approval (Maula and Murray, 2001). CVCs confirmed their ability to help portfolio firms overcome the "liability of newness" by leveraging their suppliers and customers' network (McNally, 1997; Stuart et al., 1999; Maula and Murray, 2001). More precisely, evidence showed how the entrepreneurs benefit from the parent's marketing and distribution channels to forge new commercial partnerships with other parties that can support their projects' development. CVCs' parents are usually well-established players and can exploit their central position in the industry to provide portfolio firms with new deals.

Evidence is contrasting about the CVCs' support in overcoming the "liability of foreignness", i.e., the ability to enter foreign markets (Zaheer, 1995; Maula and Murray, 2001). Even though the corporate can transfer critical stacks of knowledge and resources and provide a stamp of approval, the CVC-backed startups' internationalisation does not overperform the non-CVC-backed ones (Li Puma, 2006).

Besides, evidence pointed out how CVCs tend to invest in younger ventures (Chemmanur and Loutschina, 2008) rather than IVCs. It means that CVCs provide significant market value by investing in younger and riskier firms that otherwise would not be financed by others (Chemmanur et al., 2014). Entrepreneurs, especially those operating in immature high-tech industries (Chemmanur and Loutschina, 2008), can benefit from the CVCs' interest in a window on new technologies (e.g., Benson and Ziedonis, 2009) to obtain crucial financial resources to survive and grow.

Lastly, the corporate parent organisation comes from a technology-intensive industry; thus, it can carry out technical due diligence and provide support for the young firms' technological development. Evidence confirmed that entrepreneurs benefit from the dyadic relationship by continually improving technology and products (Maula and Murray, 2001).

It is worth summing up the evidence on the general value-adding services by leveraging Large and Muegge's classification (2007). The main CVCs value-added contributions divide in:

- i) Internal contributions, i.e., support to internally develop the startups. Entrepreneurs can benefit from the parent knowledge stock to internally develop their technologies (Maula and Murray, 2001; Bjogum and Soheim, 2015).
- ii) External contributions, i.e., source external players that can bring value. CVCs connect startups with customers and suppliers and provide them with legitimacy in both the financial and product markets (Maula and Murray, 2001; Bjogum and Soheim, 2015), opening up new sources of deals.

4.8.2 Evidence on Learning

One of the main advantages of working closely with a corporation is learning about the market, technology, and industry (Henricks, 2002) and grasping the best practices and processes (Yang, 2012). Entrepreneurs can quickly get access to meaningful insights and improve their performances. This knowledge transfer is strictly related to the social

interaction between the investee and the investor (Maula et al., 2003; Maula et al., 2009). The higher the interaction, the higher the learning benefits for the startups as it eases the information exchange, opens up to value-adding knowledge combination, and increases the cooperation opportunities (Cohen and Levinthal, 1990; Dyer and Singh, 1998; Maula and Murray, 2002).

However, social interaction is not straightforward to obtain. The CVCs-new ventures relationships are highly affected by the "CVC Paradox" (Dushnitsky and Shaver, 2009): even though the relationship will be beneficial for both sides, the startup's misappropriation risks are too high and may prevent the equity tie formation.

Therefore, social interaction depends on contingency and, in particular, two elements affecting the specific deal context, namely, complementarity (Maula et al., 2003; 2009) and relationship safeguards mechanism (Maula et al., 2009).

For complementarity, the extent to which the two firms' resources are complementary considered, i.e., their interaction can generate additional and shared value (Sakakibara, 1997). Complementarities are also in the product market, i.e., the increase in sales of one party's product increases the other's sales (Maula et al., 2003). Complementarity has proved to align the dyad's objectives, resolving the disclosure issues connected with the equity tie and thus increasing social interaction (Maula et al., 2003; 2009).

On the other hand, the startups' relationship safeguards are those actions or instruments aimed at protecting the investee firms from possible threats of the corporate investor. The adoption of safeguards can destroy the trust between the parties as it makes explicit the competitive nature of their interests (Larsson et al., 1998). The distrusted partner - in this specific case, the corporate - can react with a negative disposition toward the one imposing relationship safeguards - i.e., the startup - by reducing commitments to collaboration (Ghoshal and Moran, 1996). Therefore, the safeguards' adoption leads to lower social interaction between the parties (Khanna et al., 1998; Maula et al., 2009).

To conclude, social interaction has proved to be effective in creating mutual trusts and improving the learning opportunities for new ventures, underlining the importance of the insights coming from Colombo and Shafi (2015): parties have to engage in social interaction rather than self-protect themselves to reduce the misappropriation risk.

4.8.3 Evidence on Startups' Innovation Output

Entrepreneurs operating in high-tech industries tend to wonder whether CVCs can provide them with better support in their innovation activities than other funds. Innovation, through the so-called creative disruption (Schumpeter, 1942), generates new ideas and products (e.g., Acs and Audretsch, 1988) and brings benefits not only to the entrepreneurs, i.e., contributes to the success of the firm (Song et al., 2008), but to the whole society guaranteeing economic growth (Schumpeter, 1942). The following paragraph investigates the role of CVCs in the innovation cycle and, more precisely, presents empirical evidence on whether the CVCs can impact positively on the new ventures' innovativeness.

CVC and Innovation: Theoretical Background

From a theoretical point of view, CVCs seem to be better suited for nurturing portfolio firms for several reasons. First, they do not operate with limited partners but, on the other side, need to take care of the corporate's strategic goals. Therefore, CVCs have all the incentive to provide their portfolio firms with knowledge in technology and industry. Besides, parents are more interested in the startups' technological development and are more patient with the capital invested (Dushnitsky and Lenox, 2005a; Wadhwa and Kotha, 2006). In other words, CVCs operate with a longer period in mind and do not pose a strong focus towards financial performances that may force the startup to face an unhealthy development speed (Chemmanur et al., 2014). Therefore, CVCs seem better equipped to assess and nurture new ventures' technologies and products (Chemmanur et al., 2014) and more open to experimentation than other funds.

On the other side, there might be other elements counterbalancing the CVCs positive impact on the portfolio firm's innovation. First, CVCs procure their fund directly from the parent company. It leads to centralised resource allocation and corporate socialism (Rajan, Zingales, and Servaes, 2000; Scharfstein and Stein, 2000), which, in turn, can foster mediocre R&D activities (Williamson, 1985; Seru, 2012). Secondly, the corporate's strategic objectives may incentivise investment managers to use the parent's knowledge to exploit rather than nurture the firm hindering innovation activities in the new firms (MacMillan et al., 2008).

4.8.3.1 Evidence on the Startups' IP Portfolio

The changes in the startup's IP portfolio composition represent an indirect proxy of the CVCs' impact on the startups' innovation outcomes. IP's role is to facilitate a firm's economic activity, and it can decline in three different forms:

- i) Patents, i.e., the result of new knowledge creation activities that lead to discovering and developing technical ideas (Teece, 1986; Arora, 1997).
- ii) Copyrights. These IPs grant a temporary monopolistic right for original works of authorship. They involve disparate fields, such as newspapers or software (Heymann, 2006).
- iii) Trademarks, i.e., symbols, designs, phrases, words, or a combination of all of them that a unique source provides for a specific product or service (Gao and Hitt, 2012).

They divide into two clusters: tech-centric IP and market-centric IP (Uzuegbunam et al., 2019). Patents and copyrights are tech-centric IPs as they incentivise the creation of novel technologies. They are able to provide the proper support in the development of arm's length contracting between the owners and the buyers of the new technology via high-powered incentives. On the other hand, copyrights are considered market-centric as they are a proxy of product innovation and commercialisation activities in firms (Gao and Hitt, 2012). More precisely, they can enhance market valuation and performance (e.g., Teece, 1986), facilitate customer retention, cross-selling, up-selling, and introduce new products (Pitt, Watson, Berthon, Wynn, and Zinkhan, 2006).

Analysing the CVC-startup dyadic relationship by adopting an IP strategy lens (Arora & Ceccagnoli, 2006; Krasnikov, Mishra, and Orozco, 2009; Gao and Hitt, 2012) combined with the resource dependence theory (Emerson, 1962; Pfeffer and Salancik, 2003), Uzeugbunam et al. (2019) were able to determine which type of IP startups manage to improve over the investment period. In particular, the evidence demonstrated that CVC investments increase the production of technology-centric IPs without impacting the rate of market-centric IPs. CVCs may be interested in providing all the necessary resources to support the development of the technology as they attempt to tap into new knowledge to transfer to the parent (e.g., Dushnitsky and Shaver, 2009). However, concerning the market-centric IP, it is essential to consider that, since the outset, new firms rent CVCs' parent distribution channel and marketing resources (Basu et al., 2011). Thus, the startup is not urged to develop these capabilities; on the other side, the corporation prioritises R&D development for its strategic

objectives (Pahnke et al., 2015). Thus, the startup will tend to rely on the parent in order to operate in the marketplace, adopting a “rent-for-life” perspective rather than a rent-to-build. To conclude, these results explain why corporate investors – in the short term - are more tolerant to failure with their portfolio companies, i.e., concede them additional time to cope with setbacks in the innovation process (Chemmanur et al., 2014). These conditions could urge CVC-backed ventures to continue specialising in R&D for a longer time rather than building the capabilities necessary to operate independently

4.8.3.2 Positive Impact on Innovation

Theoretical analyses conclude that the CVCs' impact on the startups' innovativeness is not straightforward, and many trade-offs influence it. Empirics seems to reflect this pattern by providing mixed results. To picture the current scenario better, the upcoming section will start to deepen into the evidence demonstrating that corporate funding benefits the portfolio firms' innovation.

Chemmanur et al. (2014) analysed worldwide IPO startups from VentureXpert and Security Data Company databases and evaluated the CVCs investment impact in terms of patents output. In order to avoid skewed results, they analysed both the ex-post and ex-ante CVC-backed startups' innovation rate to discern the selection effect with the treatment effect. More precisely, it was necessary to evaluate whether the CVC-backed startups were more innovative per-se - and thus CVCs were talented in scouting - or they were not the best performing and experienced an increase in innovation output thanks to CVCs funding. The authors found confirmation for both selection effects, i.e., CVCs are more capable of scouting and treating innovative startups, i.e., CVC-backed startups experience a higher innovation rate than others. Besides, to avoid any issues related to survivorship bias, Chemmanur et al. (2014) also considered the changes in innovation output of both exited and written-off startups. They found that CVCs-backed experienced a higher jump in innovation rate compared to IVC-backed ones only if they ended up being acquired or listed; the results do not hold for the written-off ones.

The authors concluded their works by providing two explanations on the positive results that CVCs have on the portfolio firm's innovation:

- i) Corporate expertise (Fulgheri and Sevilir, 2009; Robinson, 2008). CVCs have deep knowledge of the industry and technology; thus, they can better evaluate and support the project. Furthermore, technological fit, i.e., the new firms and the

parent operate in the same technological space, has proved to enhance the positive effect on innovation

- ii) Tolerance to failure. It is fundamental to support the innovator's experimentation phase (Manso, 2011). They proved that a longer investment horizon of the CVC has a positive impact on the innovation rate.

Alvarez-Garrido and Dushnitsky (2016) analysed a sample of US biotechnology ventures and their innovation output via the patents obtained. Similarly to Chemmanur et al. (2014), they confirmed that CVC-backed startups experienced a higher innovation rate. Besides, the authors deep-dived into analysing the mediating role played by two variables, namely, geographical proximity and complementary assets.

Geographical proximity should improve both the CVCs' screening and monitoring by increasing the exchange of information and interaction, but also facilitate operational assistance and other nurturing activities (Sorensen and Stuart, 2001). It follows that, for innovation-related activities, working closely with corporate R&D facilities should have a positive impact as they can provide knowledge, personnel, and resources to help the development of the technology. The authors confirmed these assumptions and found that working physically close plays a moderating role in enhancing innovation by increasing the portfolio firms' innovation output. Secondly, assets complementarity provides affordable access to essential resources and induces the startups to dedicate a bigger slice of their budget to undertake costly innovation. For them, the most valuable complementary assets are those related to the commercialisation of the product. Alvarez and Dushnitsky (2016) proved that the need for commercial complementary assets plays a moderating role in improving the innovation rate of CVC-backed portfolio firms' impact: the higher the need, the higher the positive impact of CVCs.

4.8.3.3 Contingency Effect on Innovation

Paik and Woo (2017) investigated contingencies effects on innovation by analysing the intensity of the startups' R&D investments. They argued that R&D investment is a good measure for the input side and reflects the long-term strategic resources allocation. Besides, it can provide meaningful insights into the heterogeneous preferences of the three players involved (IVC, CVC, and entrepreneurs). The authors analysed a panel of startups from VentureXpert and Compustat in the 2002-2011 period with no specific geographic restriction and proved true hypotheses.

For the authors, the level of R&D investment depends on two variables: CVC investment intensity and the founder's presence.

First, concerning the CVC investment intensity, they found that the greater the CVC ownership, the higher the R&D intensity. It seems that the crucial factor is not the board's membership - as stated by Yang (2012) - but the ownership stake. They labelled this result the "CVC Ownership Effect", and it articulates in the following elements:

- i) Direct Corporate Governance Effect. CVC investors with significant ownership are more likely to influence the new firm's strategic decisions. CVCs are less time-constrained, and CVC investments are seen by the corporate as R&D outsourcing (Basu et al., 2011). It follows that they are more likely to influence strategic resource allocation towards tech-related projects
- ii) CVC Investor-Venture Interaction Effect. The greater the ownership stake in the portfolio, the higher the incentive to provide complementary assets facilitating commercialisation (Teece, 1986; Gans et al., 2002)
- iii) Technology Endorsement Effect. The new firms' technology lacks legitimacy (Zimmerman and Zeitz, 2002), and the presence of the corporate investor can resolve the uncertainty around it and support it to become an industry standard. As a consequence, new firms will have more incentive to invest more in the development of technology.

Concerning the founders' presence, the authors coined the "Founder Incumbency Effect". More precisely, the empirics showed that when the founders are top managers of the ventures, they enhance the new firms' R&D intensity. Their contribution is different from professional agent managers (Souder et al., 2012) for two main reasons:

- i) Founders have more entrepreneurial passions (Cardon et al., 2009) and are more attached to the firm (Wasserman, 2006)
- ii) Founders differ in terms of knowledge, values and attributes (Jayaraman et al., 2002), which are crucial for the firm's development, especially in technology-intensive industries (Cardon et al., 2012). Arthurs and Busenitz (2003) introduced the term "ownership plus" mentality to underline the founders' special commitment.

Thirdly, they proved that the interaction between the two previous effects increases the R&D intensity of the new ventures as a direct consequence of the knowledge spillover that can

occur during the interaction. More precisely, the greater the involvement via ownership, the greater the interaction frequency and the spillover opportunities that the founders can capitalise on at their advantage. Unlike agent managers, founder managers are more capable of recognising and exploiting opportunities (Baron, 2006) thanks to their tacit knowledge about venture technology (Koskinen and Vanharanta, 2002). On top of that, the parties' objectives align when the CVCs have more ownership share. It follows that they tend to form a coalition forcing the other investors, more interested in short term goals, to allocate the resources to long term tech-related projects.

4.8.3.4 Neutral Impact on Innovation

Pahnke et al. (2015) found different results concerning the CVCs' impact on the portfolio firms' innovation rate than the ones previously introduced. More precisely, they analysed new ventures in the US medical device sectors and investigated the CVCs' post-investment changes in both technical innovation, i.e., patent approval, and commercial innovation, i.e., product innovation. They discovered that, on the one hand, CVCs were able to select innovative new firms, thanks to their superior knowledge of the technology, but on the other, their treatment effect on innovation was uninfluential compared to other peers.

The authors explained the results leveraging on the institutional logic theory listing several issues hindering the enhancement of venture innovation, namely:

- i) Focus on corporate strategic goals
- ii) Dispersed authority
- iii) Slow and complex decision making
- iv) Internal conflicting goals.

They also argued that the CVCs managers tend to remain more distant from portfolio firms to avoid any possible conflicts. Consequently, it becomes less likely that the entrepreneurs receive the right support in terms of resources, mentoring, and disciplines needed to spur innovation.

Similarly, Wang et al. (2019) found support for the CVCs' neutral impact on innovation outcomes. They analysed the changes in innovation output (patent application) and R&D input (R&D investment over Annual Sales) for Chinese listed companies and found interesting results. Firstly, the presence of complementary assets and the higher tolerance to failure - characterising the CVCs funding - do not lead to higher innovation rate support. Subsequently, they questioned whether the dyad's technological fit could enhance the patent output, but

the results were similar to the previous one. However, the authors proved that the positive results depend on two contingency factors: geographical proximity and product-market relationship.

Geographical proximity, all else being equal, has proved to enhance the innovation rate of portfolio firms, suggesting that innovation requires geographical localisation (Jaffe et al., 1993). More precisely, physically close offices or facilities speed up exchanging ideas and the experimentation of technologies necessary to reduce the uncertainty surrounding the innovative offerings (Agrawal et al., 2006; Fleming et al., 2007).

Concerning the product-market relationship, when the two parties have complementary products, the strategic and technological fit can boost the investee firm's innovation input and output. When the corporate and the startups' objectives align in terms of innovation performance and new product development (Shum and Lin, 2007), i.e., the strategic fit is reached, the startups are more likely to get support and receive internal resources (Hong, 2000). It follows that CVCs tend to pick technologies that fit their development strategies (Ivanox and Xie, 2010) to access to new technologies and better support them (Chemmanur et al., 2014). Starting from these assumptions, the authors proved that when the dyad strategic objectives align and the technologies are similar, entrepreneur can benefit in terms of innovation from the relationship; however, when the two parties have a competitive relationship in the product-market, the authors found that CVCs play an inhibitive role on innovation performances.

4.8.3.5 Selection and Treatment Effects of CVC

The CVCs' positive effects on the new ventures' innovation performances can be the results of a cherry-picking behaviour. Indeed, it is reasonable to assume that CVCs are not able to provide any value-adding activities that improve innovation, but they are solely able to pick up firms exhibiting a higher level of innovativeness. It becomes necessary to disentangle the selection and the treatment effects of the CVCs on the startup innovation performances to validate their impact truly.

Parker and Steensma (2013) addressed the issue by analysing pre-and post-investment innovation rates of startups from the VentureXpert database from 1990 to 2003.

The results of their study show how CVCs are more capable than IVCs in both screening and treating innovation-intensive ventures.

Concerning the selection effect, the authors justify the greater performances leveraging on three factors. First, the parent's strategic objectives consider CVC investments as a learning opportunity to combine external knowledge with internal capabilities to generate value (Dushnitsky and Lenox, 2005; Wadhwa and Kotha, 2006). Secondly, CVCs higher investment rate in innovative companies aims to increase the likelihood of creating synergies with other portfolio firms. Thirdly, IVCs are interested in innovation only if it guarantees greater profitability and market value. They are focused on realising capital gains rather than other strategic benefits.

On the other side, the higher collaboration degree between the CVCs and startups can explain the former treatment effect's better results. The close interaction facilitates knowledge and resource transfer to create value-adding synergies (Dushnitsky and Lenox, 2005; Wadhwa and Kotha, 2006). Besides, CVCs closely wed the resources to the new ventures' needs (Keil et al., 2010) without fear of being held up thanks to their equity position (Kim and Mahoney, 2010; Park and Steensma, 2012). In other words, corporate investors have a stronger preference to support new ventures' innovative capabilities and are better equipped to provide the resources facilitating the innovation process.

Finally, the authors proved that an investor's reputation enhances its value-adding contribution, i.e., trustworthy CVCs have a more significant treatment effect than others. They justify the result with several arguments. Firstly, reputation can attract potential partners and provide new firms access to vital resources in the marketplace (Stuart et al., 1999; Zimmerman and Zeitz, 2002; Graffin and Ward, 2010). The stamp of approval from reputable CVCs reduces the uncertainty surrounding the new ventures and increases their likelihood of developing open market relationships (Podolny, 1994). Lastly, reputation can determine whose interests will likely receive attention in case of disputes with other stakeholders, i.e., reputable partners are usually the most listened to, and can mitigate potential opportunistic behaviour of investors, i.e., they carry out proper conduct to avoid issues that may jeopardise their reputation.

AUTHORS	IMPACT
CHEMMANUR ET AL. (2014)	<i>Positive</i>
ALVAREZ-GARRIDO AND DUSHNITSKY (2016)	<i>Positive</i>
PAIK & WOO (2017)	<i>Contingent</i>
PAHNKE ET AL. (2015)	<i>Neutral</i>
WANG ET AL. (2019)	<i>Neutral</i>
PARK AND STEENSMA (2013)	<i>Positive</i>

Tab. n.8 – Summing Up the CVCs' Impact on Innovation

4.8.4 Evidence on Success

In the startup ecosystem, success is represented by an exit event, i.e., when the founders and the ventures' investors sell their shares to the public market or another corporate. Startups will be targeted for an exit event if they are able to obtain a higher market valuation compared to the market peer (Guo et al., 2015), which is strictly dependent on their actual and future financial performances.

CVCs should provide a unique set of value-adding services that, according to the literature, should enhance the performance and the value of the portfolio firms (Chesbrough, 2002). For example, they can provide access to complementary assets such as knowledge or manufacturing capabilities or access to distribution channels (Chesbrough, 2000; Maula et al., 2003b; Dushnistky and Lenox, 2005), but also act as a stamp of approval that helps new firms to overcome the "liability of newness" (McNally, 1997; Stuart et al., 1999; Maula and Murray, 2001).

However, the debate on whether the CVCs' influence can increase the portfolio firms' chance of success is open. Evidence is contrasting, and the literature has not reached a consensus.

The next paragraph presents some empirical evidence about CVCs' value-adding effect and their subsequent impact on the success rate.

4.8.4.1 Value Adding Contribution

Wang et al. (2019) argued that CVCs' added value goes beyond pure equity financing; the sets of complementary assets provided are crucial for new ventures' future success (Chesbrough, 2002). Therefore, it is reasonable to assume that CVC-backed entrepreneurs will generate higher post-investment value.

The authors investigated this assumption in their study by analysing a panel of CVC-backed ventures vis-à-vis IVC-backed ones. The results confirmed the CVCs' positive effect on market valuation: their portfolio firms showed higher post-investment value than their peers.

Subsequently, they controlled for two variables that can influence the results, namely i) technological fit; ii) geographical proximity.

Technological fit has proved to improve the CVC-backed market value, signalling the crucial role of knowledge transferring from the corporate. It is essential to point out that the results do not stand when the two parties compete in the same market. In this case, the competition in the product-market leads to a decrease in market value, opening the debate for the swimming with shark dilemma (Katila et al., 2008).

Concerning geographical proximity, Wang et al. (2019) demonstrated how it enhances market valuation as the portfolio firms can benefit from more frequent interactions with the parent firm. Smoothness in interaction leads to higher knowledge and technological transfer and eases communication that ultimately benefits the portfolio firm.

Ivanov and Xie (2010) found similar results analysing IPOs prospectus from VentureXpert. CVCs proved to enhance the performance of portfolio firms, more precisely leading to higher market valuation. The authors brought forth the "fit" issue, as did by Wang et al. (2019), but approaching it from a different angle. More precisely, they controlled the strategic fit, i.e., when the corporate and the startup's strategic objectives overlap. When the dyad has a strategic fit, the objectives are aligned, and the CVC has more incentives to provide value-adding benefits than an IVC. From this assumption, the authors proved that the fit presence increases the positive effect that CVCs have on the portfolio companies' valuation.

As a further test, the authors – as done by Maula and Murray (2001) - proved that the positive results in terms of market value are not linked to superior screening capabilities. CVCs showed superior monitoring results thanks to their ability in adding value and creating synergies beyond a simple corporate alliance.

In another study, Chemmanur and Loutskina (2011) analyse the Longitudinal Research Database, which includes all the public and private U.S. manufacturing firms, and found evidence supporting CVCs' capabilities to generate value. More precisely, they observed that valuation and various CVC-backed startups' price-to-value multiples are higher than IVC-backed ones in the first-day closing price. Besides, they proved that the ability to provide value is not only due to a temporary overvaluation, as the stock market results may suggest; the

authors found that the long-term stock return of CVC-backed startups over the five years after the IPO is significantly higher than the IVC-backed ones.

In the second part of their study, the authors analysed the differences concerning operating performances. The results demonstrated that the CVC-backed startups underperform their peers, but they are able to catch up over time, more precisely around five years after the listing. One possible explanation is the high-tech nature of those firms that prompt them to invest in assets that will ultimately repay years later. Secondly, it signals how CVCs can take public younger firms - still not profitable - to secure a higher growth option.

The results concerning the value-adding benefits of CVCs, however, present one main issue. The analysis considers only exited startups; it is difficult to appreciate the CVCs role in improving the success probability without considering a more heterogeneous sample.

4.8.4.2 CVC and Portfolio Firms' Exit Rate

The impact of CVCs on the portfolio firms exit rate in comparison with traditional VCs is not clear. The literature has not reached a consensus, and, so far, two different sides have emerged. On one side, Chemmanur and Loutskina (2011), who analysed worldwide startups from SDC Platinum Expert, and Guo et al. (2015), who analysed worldwide startups from ThomsonOne, found a positive relationship between the CVC-backing and the increase in success rate vis-à-vis to other peers invested by IVCs. On the other side, Gompers and Lerner (2000), and Dushnitsky and Shapira (2010), found that CVC-backed performed at least as good as solely IVC-backed.

4.8.4.2.1 Positive Effect on Exit

Despite some differences, the evidence seems to suggest that CVC-backing has the potential to decrease the failure rate in startups (Gompers and Lerner, 2000), increase their speed (Stuart et al., 1999), and their success rate (Chemmanur and Loutskina, 2008; Dushnitsky and Shapira, 2010; Guo et al., 2015). The main reasons for these results are CVCs' peculiar characteristics. First, the credibility of the corporate plays a signalling role and attracts new investment partners for startups that can shorten their time to exit and obtain a better valuation (Stuart, Hoang, and Hybels, 1999; Maula and Murray, 2001; Chemmanur and Loutskina, 2008; Dushnitsky and Shapira, 2010). Secondly, CVCs are a more patient venture capital and do not want to damage their reputation as bad investors; for these reasons, they tend to wait before writing off investments. It leads to a lower failure rate for CVC-backed firms (e.g., Gompers and Lerner, 2000). Besides, as the Guo et al. (2015) model and its related

evidence showed, the likelihood of reaching an exit should proportionally increase with the investment amount. CVC-backing leads to a higher valuation and, as a consequence, should increase the amount invested per round and the exit's likelihood.

4.8.4.2.2 Contingency Effect on Exit

Another stream of evidence assumes that the CVCs' impact on exit probability strictly connects to contingency factors that may influence the results. Indeed, evidence underlines that CVC's presence cannot justify alone the increase in the success probability, and other variables need to be considered.

Strategic fit

According to Gompers and Lerner (2000), the critical element that enhances CVCs' investments is the strategic fit, i.e., a strategic overlap between the dyad's objectives. First, it facilitates interaction and decreases agency issues. Secondly, it increases the CVCs' incentives to provide value-adding contributions. From these assumptions, the authors proved that CVCs investments lead to a higher success probability for portfolio firms.

A few years later, Gompers (2002) integrated the previous study by accentuating the role of the strategic fit in the startups' exit rate and compared the results to the IVCs-backed performances. This time, the author demonstrated the differential role the strategic fit plays: CVC investments as a whole do not outperform IVC ones unless the dyad strategies are complementary, i.e., they are in a fit.

Complementarity

Similarly, Park and Steensma (2012) studied a panel of high-tech startups and analysed the role played by specialised complementary assets and environmental uncertainty.

Specialised complementary assets require a high level of relationship-specific investment and thus have little residual value outside the specific contract; on the other hand, uncertainty means the ability to predict future needs and resources.

Hence, according to the transaction costs theory, the authors proved that:

- i) Startups should enter in an equity tie with CVCs solely when they need specialised complementary assets as it will lead to an increase in the success rate and a decrease in the failure rate
- ii) Startups should enter in an equity tie with CVCs when there is uncertainty about the context as it will lead to a decrease in the failure rate with no increase in the success rate.

The authors explained the results by leveraging on two elements. First, firms in need of specialised complementary assets can benefit more from a tight relationship, i.e., equity contract, with a corporate investor as it mitigates potential misbehaviour. Otherwise, it is more convenient for entrepreneurs to find resources in the open market without losing their ownership. Secondly, sourcing complementary assets from equity partners is safer than contracting with arm's-length suppliers when the context is uncertain. Indeed, the former have more incentives to adapt to the entrepreneurs' new requests, which are likely to change according to the environment's characteristics.

Governance Structure

Yang (2012) - analysing the issue from an inter-organisational learning point of view - argues that one of the main advantages of working closely with a CVC fund is the possibility to tap into external knowledge sources. Indeed, the parent may help entrepreneurs overcome their inexperience (Teece, 1986; Deeds et al., 2000) in successful product commercialisation (Deeds and Hill, 1996). The authors backed up their assumption by analysing a panel of VCs funded startups from VentureXpert from 1996 to 2000. They found out that the knowledge outflow is positively and significantly related to an increase in IPO probability.

However, the author argues that the programs' governance highly influences the corporate's knowledge flow to the startups. It can change the learning dynamics and, therefore, the expected benefits. In the study, she considered two variables affecting the knowledge transferring processes, namely:

- i) Compensation scheme
- ii) Board representation.

Concerning compensation scheme, it is worth analysing the issue from an agency theory perspective as incentive schemes could mitigate the possible CVC managers' agency behaviour. In an opaque environment like the VC context, monitoring is costly and, thus, outcome-based compensation may represent the best solution for the corporate (Conlon and Parks, 1990). However, a high-compensation scheme can be a double-edged sword. It can influence the agents' action (Galbraith and Merrill, 1991) towards their interests rather than the principal's (Hendry, 2002), i.e., the fund managers will prefer their personal financial return over the corporate strategic benefits. Conversely, they are a positive element for startups as they guarantee that the managers will provide the best effort in helping them. Their bonuses are tied to the ventures' success, and, as a consequence, they will engage more

in knowledge and technology transfer from the parent to help them increase their performances. Besides, Dushnitsky and Shapira (2010) support Yang's (2012) assumption by proving that high-powered compensation schemes improve the startups' performances by urging managers to take more risk in supporting their ventures.

Concerning board representation, Yang (2012) found that a higher board representation does not improve the knowledge flow to the startups. Board representation is considered the major post-investment monitoring mode (Gompers and Lerner, 2004), guaranteeing the principal a spot to monitor the agent's actions closely. Besides, it demonstrates a commitment on behalf of the corporate. However, the entrepreneurs' fear that CVCs-belonging board members can misappropriate their ideas may offset all the possible learning benefits (Gompers and Lerner, 2004; Masulis and Nahata, 2009). In other words, the misappropriation risk counterbalances the positive effects that board representation may have.

4.8.5 Evidence on Economic Performances

The startups' ability to be successful in the long run tightly seems to connect to their financial results. For example, Bayar and Chemmanur (2011) showed that the probability of new ventures to exit via IPO and its subsequent IPO market valuation depends on the assessment of outside investors that carefully evaluate if the firm has obtained a viable business model and rapid sales growth. Chemmanur et al. (2011) provided evidence that the Total Factor Productivity (TFP), i.e., efficiency gain in real sales over labour and fixed capital, is positively connected to the likelihood of success, i.e., IPO or acquisition. Besides, they demonstrated VCs' crucial role that, thanks to their value-adding services, improve portfolio firms' efficiency by increasing their TFP and, consequently, the exit probability.

However, as VCs are heterogeneous, their impact on portfolio firms change according to their nature (Hsu, 2006). It becomes crucial to specifically analyse how CVCs affect the economic performances of the acquired firms.

4.8.5.1 Post-IPO Performances

Chemmanur and Loutskina (2008) studied a panel of startups operating between 1980 and 2004 from the SDC Platinum New Issue Database and analysed the post-IPO economic performances to understand the CVCs' funding impact vis-à-vis to the IVCs' one.

The results highlighted several insights. CVC-backed experienced lower sales-margin in the years after the exit, but they reduced the gap over time. However, it is reasonable to argue that these initial differences in profitability may be connected to different exogenous factors, such as industry and maturity stage, compromising the analysis. To cope with these deficiencies, the authors adopted sales growth as a dependent variable. The results, in this case, also confirmed the prior findings: IVC-backed experienced higher sales growth subsequently to the IPOs, and the wedge diminished over time. However, the authors found that the CVC-backed - nonetheless having lower sales growth and margin - were registering greater R&D expenditure. These results may suggest that CVCs are able to take public younger firms which are still not profitable.

4.8.5.2 Post-Funding impact on Overall Economic Performances

It is worth noting that the Chemmanur and Loutskina (2008) study may suffer from "survivorship bias" – as they included IPO firms solely in the sample - and cannot provide a complete picture of the CVC's impact. The most overarching study approaching the CVCs' economic impact is the Colombo and Murtinu (2017) one. The authors studied European high-tech startups founded before 2010 and were less than 20 years old (as per 2010) from the VICO database.

To investigate the magnitude of the CVCs' impact, the authors relied on Overall Economic Performance (OEP) as a unit of measure. OEP is the results of industry-specific firm-level Cobb-Douglas production functions that consider both input and output variables. The input variables include:

- i) Payroll expenses providing a measure of the human capital intensity within the startup
- ii) Real fixed assets conveying information of the tools at disposal.

Concerning the output measure, the authors used real sales values to provide information on the product market's performance.

The authors broke down the impact on startups in terms of:

- i) Different channels in which the investment has an impact, i.e., input or output side
- ii) Timing when the impact manifests in the OEP, i.e., long vs short term.

Evidence leads to several insights. First of all, CVCs have a significant and positive impact on portfolio firms' performances, as much as IVCs. However, the two differ in how they bring benefits to the entrepreneurs.

Concerning the timing, the CVCs' impact in the short run is not significant and does not lead to any economic improvement; conversely, in the long run, it becomes representative. These results highlight the CVCs' role as patient capital with the final aim of nurturing the portfolio company rather than scaling it up quickly.

Considering the channels, entrepreneurs can benefit both in terms of output and input. For the output side, the CVCs investments have a relevant impact in the short and long run. However, the magnitude of the effect is lower than compared to IVCs. The results highlight how the CVCs are more patient and focused on developing the technology rather than speeding up the time-to-market strategy. Conversely, IVCs want to obtain sales growth, as it is considered a success factor for entrepreneurial firms (e.g., Weinzimmer et al., 1998), to increase the likelihood of the exit event (Chemmanur et al., 2010, 2011; Puri and Zarutskie, 2012). On the input side, CVCs do not increase payroll expenses and fixed assets both in the short and long run. This result underlines the triad's symbiotic relationship: CVCs via its parent share know-how and workforce with portfolio firms from the outset (Gompers and Lerner, 2000; Ivanov and Xie, 2010) and the latter can sustain a sale increases without experiencing higher input expenses.

4.8.5.3 Startups' Growth

Bertoni et al. (2013) focused on the economic parameters' growth for Italian startups between 1994 and 2003. They demonstrated how the IVCs' need for grandstanding will have impact on portfolio firms' performances in terms of sales' and employees' growth.

Grandstanding is the consequence of information asymmetries between the venture funds and potential limited partners, which nudges the former to undertake actions signalling their abilities (Gompers, 1996). However, CVCs among all the different VC types seem to be less affected by the issue. First of all, they do not need to raise capital at fixed terms with external investors as usually all the funds are provided by the parent. Besides, the latter does not need to access richer information set as the CVC is usually a controlled entity, and the interaction is frequent. Therefore, these specific characteristics lead Bertoni et al. (2013) to assume that the growth mode of CVC-backed firms will differ from the IVCs-backed ones.

The first parameter analysed by the authors is sales growth which is considered one of the most important indicators for an entrepreneurial venture's business success, as it proves product-market fit which is difficult to achieve (Weinzimmer et al., 1998; Barringer et al., 2005). In addition, rapid sales growth is often the only assessment parameter in the absence

of a historical value, i.e., previous profits or book values (Davis, 2002). As a consequence, the rapid sales growth of portfolio companies positively affects the venture capital's reputation. The evidence seems to confirm their assumptions: considering that the CVCs' lower incentives to grandstand, the authors proved that the treatment effect in boosting sales growth is not as high as IVCs.

Secondly, evidence shows that CVCs' impact on employment growth is significant and keeps growing at a decreasing rate in the short term. The authors argue that the reasons for this result are mainly two. Firstly, according to the literature, employment growth is strictly related to sales only when the corporate has to make firm-specific and product-specific investments in human resources to let employees gain new knowledge or improve the service (Chandler et al., 2009). It follows that the sales and employment growth patterns are similar. Secondly, CVC-backed sales growth is not so steep as IVC-backed. This element reduces the uncertainty surrounding their future, and so hiring employees is more reasonable: hierarchy outperforms the market.

It is worth noting that the results on employee's growth rate are different from the Colombo and Murtinu (2017) ones, which showed how CVC-backing does not increase payroll expenses. This discrepancy can be a direct consequence of a CVCs' evolution. More precisely, the corporate funds' main strengths, i.e., complementary assets and knowledge, involve creating a symbiotic relationship (Gompers and Lerner, 2000; Ivanov and Xie, 2010). It is reasonable to assume that they have learnt how to provide them more effectively for startups reducing the latter's need for labour inputs.

4.8.5.4 Cash Flow Analysis

Obtaining financial resources is one of the most impeding obstacles for new ventures as they suffer from capital market imperfections (Carpenter and Petersen, 2002a). More precisely, young firms lack a proven track record that, in turn, increases the information asymmetries between them and the investors regarding the quality of the firm. They build on intangible or firm-specific assets and, therefore, usually lack tangible assets to pledge as collateral (Denis, 2004; Carpenter and Petersen, 2002a). On top of that, they are limited in carrying out tangible asset investments, which represent a heavy burden for financially constrained firms: investment-cash flow sensitivity increases as assets' tangibility increases. These market imperfections increase financing costs, i.e., entrepreneurial projects receive either rationed

funds or cannot obtain financing both in the equity (Myers and Majluf, 1984) and debt (Stiglitz and Weiss, 1981) sides of the market.

VC investment has proved to solve this issue and is an optimal source of financing thanks to the ability to:

- i) Deal effectively with information asymmetry issues faced by NTBFs (e.g., Amit et al., 1998; Bottazzi and Da Rin, 2002; Chan, 1983; Gompers, 1995; Kaplan and Stromberg, 2001)
- ii) Eliminate the investment-cash flow sensitivity faced by new ventures.

More precisely, they have an elastic supply curve as they have all the incentives to allocate funds to interesting prospectuses and realise a capital gain. Besides, they help entrepreneurs source external financing and other resources via the establishment of alliances (Colombo et al., 2006; Hsu, 2006), relaxing even more financial constraints, as they prevent them from building those assets or capabilities internally.

However, venture capital typologies may differ in their impact on the portfolio firms' cashflow-investment sensitivity (Engel and Heger, 2006; Tykvova and Walz, 2007). Therefore, it is necessary to investigate whether CVCs can remove new ventures' financial constraints or not. Bertoni et al. (2010) tackled the issue and deep-dived into the cashflow-heterogeneity relation by analysing a sample of Italian NTFB from 1994 to 2003.

In the study, they demonstrated that CVC-backed startups are able to increase their investment level, but, differently from IVC-backed, are still sensitive to cash-flow variation for several reasons. Firstly, corporate investors pursue strategic objectives, i.e., opening a window on new technologies that new firms are developing (Siegel et al., 1988; Chesbrough, 2002; Gompers, 2002; Dushnitsky and Lenox, 2005a, b; Ernst et al., 2005), and, hence, they are willing to provide only the capital necessary to develop the tech-side of the business. Secondly, CVCs have organisational deficiencies, i.e., they are less experienced than IVCs in investing in early-stage startups and are unable to provide attractive incentives to talented investment managers (e.g., Gompers and Lerner, 2000). Thirdly, the information asymmetries with the new venture are likely to remain high. The entrepreneur is not usually willing to reveal information about the technology due to misappropriation risk (Block and MacMillan, 1993; Dushnitsky, 2007). Consequently, CVCs - being less informed - will provide a total amount of funding that is lower than the efficient level.

For these elements, it is reasonable to conclude that CVCs' supply curve is likely to be less elastic than the IVC supply curve, and, consequently, CVCs cannot totally remove the financial constraint hindering new firms' investment.

AUTHORS	MEASURE	CVCs' IMPACT
CHEMMANUR AND LOUTSKINA (2008)	Post-IPO Startups' Performances	Higher R&D expenditure and lower sales growth vis-à-vis IVCs-backed
COLOMBO AND MURTINU (2017)	Post Funding Startups' OEP	Significative impact in the long run on OEP vis-à-vis IVCs-backed.
BERTONI ET AL. (2013)	Growth of the Startups' Economic Parameters	Lower sales' growth vis-à-vis IVCs. Significant but marginally decreasing impact on employees' growth
BERTONI ET AL. (2010)	Startups' Cash Flow	CVCs are not able to remove the startups' financial constrain

Tab. n.9 – CVCs' Impact on Economic Performances

4.8.6 The Consequences of Heterogeneity for CVCs' impact on Portfolio Companies

Chapter 2 introduced several CVCs' classifications. In some studies, the authors further investigated what implications the heterogeneity has on portfolio firms. Unfortunately, all of these are qualitative studies that underline the insufficient empirical data analysing this matter.

Zu Knyphausen-Aufseß (2010) classifies CVCs according to the corporate's "origin and profile" on one side and CVC's "focus" on the other. "Origin and profile of the corporate" refer to the industry to which the corporate belongs. The author identifies two major categories: the established-industry incumbents, i.e., the big corporation with a history in the industry, and the 'new style', knowledge-based corporate such as startups or consulting companies. On the other hand, 'focus' refers to the final objective of the CVC activities, that according to the NVCA definition, is either to create synergies or cost-saving. The four detected categories are the following:

- i) Management consulting firms CVCs, i.e., investment arms of established consulting firms

- ii) Non-technology-oriented industry incumbents CVCs, i.e., investment arms of industry incumbents that do not operate in tech-related businesses
- iii) Technology-oriented industry incumbents CVCs, investment arms of industry incumbents whose core business is related to technology
- iv) Growth-oriented startups, i.e., investment arms of big startups that invest their spare resources into innovation activities after IPO.

Starting from this classification, the author proved that heterogeneity affects the contribution a CVC can provide after a series of interviews. First of all, startup-CVCs and tech-companies-CVCs are best suited to providing technological capabilities. Startup-CVCs are able to support small technical niches as they have not developed a wide array of competencies (Donahoe et al., 2002). Conversely, tech-companies-CVCs are willing to support the development of technologies complementary to their strategic objectives (Christensen and Bower, 1996).

Entrepreneurial orientation, i.e., the capabilities to transmit the entrepreneurial spirit and best practices, is provided by the startup-CVC better. On the other hand, consulting-CVCs face more difficulties as they are more structured and analytical. Lastly, assessing established companies CVCs' contributions to entrepreneurial orientation is not straightforward: their ability is case-specific and depends on the internal structural inertia (Christensen, 1997; Klepper, 2001).

Concerning the support in developing and implementing strategies, consulting-CVCs are the most suited (Greiner and Metger, 1983); but also startups-CVCs, which have gathered entrepreneurial strategy experience during their path, can provide the right support. Incumbents-CVCs are not the best positioned for advising new firms about strategy.

Social Capital, i.e., reputation, relations, and brokering contact with experts, is the domain of tech and non-tech incumbents CVCs. They usually have credibility and a huge stock of social capital in-house. Consulting-CVCs may have a considerable amount of social capital in their network, but it is difficult for them to materialise. Conversely, startups-CVCs' social capital is usually developing and more immature.

Gutmann et al. (2019) classified CVCs accordingly to the activities carried out within the unit. More precisely, they divided activities into:

- i) Value-capturing services, i.e., all those activities that help the startup to capture value. They can be either formal as expanding the customer base and introducing new

suppliers, or informal such as expanding the business network within the corporation and the industry

- ii) Value-creation services, i.e., all the services that help new ventures build a functioning value-chain. CVCs are usually able to provide support in core business activities (operation, strategy, product development), support activities (legal or recruitment), and reputation activities (branding).

The authors identified four categories of corporate venture funds:

- i) Harvester, CVCs focused on delivering value capturing services solely and no value creation services
- ii) Builder, CVCs offering a full range of both value-creating and value capturing services
- iii) Enabler, CVCs scoring high in value-creating services but offer just a few value-capturing services
- iv) Observers, CVCs scoring low both on value creation and value capture services.

According to the empirical data collected via interviews, the authors found that Harvesters provide support in terms of distribution and marketing channels but also introduce new firms to their networks, acting as a broker with existing clients and suppliers base. Besides, they offer support for technological development related to commercialisation. To sum up, they mainly focus on providing value-capturing activities.

Builders are ideal for new ventures that need, on one side, to improve their revenues, as CVCs will provide access to their direct and indirect networks; on the other, to develop their business model and technology, as CVCs will support them with their complementary technical assets. In other words, Builders provide a good balance of both value-capturing and creating services.

Considering the Enablers, they provide a full range of company building activities. They advise and counsel new firms or get them in touch with potential clients or suppliers - also within the corporate itself – acting as a stamp of approval. In other words, Enablers offer mainly value creation services and few value-capturing ones as their core focus is the development and the scaling of the business, operations, and technology.

Finally, Observers tend to offer the right amount of support to develop the business's strategy and technology. They may support recruiting, legal advice, and reputation building and may

source some revenue streams within their networks. In other words, they tend to provide the least amount of services needed.

4.8.7 The Negative Side of CVC

Park and Bae (2018) analysed a set of biotechnology startups in the US via Thomson One Database. to investigate the CVC's impact on the innovation rate. For the authors, the dyad CVC-startup is a learning alliance (Hamel, 1991), i.e., the two parties can learn from each other, and it is supposed to accelerate the participants' capabilities development and decrease the uncertainty surrounding the adoption of external knowledge (Lane and Lubatkin, 1998). As a consequence, there are all the elements to improve the startups' innovation rate. However, empirical analyses highlighted how CVC investors' presence per-se has not significantly improved the startups' innovation performances. It can only become significant when the relationship starts at a later development stage. They argued that older startups have a deeper understanding of the technology and become more conscious of the additional technical knowledge needed. Thus, innovation-wise, they can benefit more from the relationship.

Morover, Park and Bae (2018) deep-dived in the analysis to understand the patent stocks' role in determining CVCs' impact better. Prior studies argued that the patents' presence should favour the equity-tie formation as they reduce the misappropriation risk and favour knowledge sharing (e.g., Katila et al., 2008; Dushnitsky and Shaver, 2009). They tackle the issues by leveraging on the bargaining perspective applied to the strategic factor market concept (SFM) (Barney, 1986; Adegbesan, 2009), which says that - all else being equal - the total value an acquirer can appropriate, depends on the combined effect of the relative scarcity, relative complementarity of resources and the relative bargaining ability of the parties. In the CVC case, the parent company is the acquirer, and the startup's technology can be regarded as an SFM; the latter's patent stock will determine the relationship between the two. More precisely, on one side, the presence of patents signals to the acquirer the startup's innovation capabilities, i.e., its value (Hsu and Ziedonis, 2013); on the other, it provides the entrepreneurs with a relative higher bargaining power, i.e., limits misappropriation risk. Therefore, it is reasonable to assume that the patent presence would lead to a higher post-funding innovation rate.

However, the empirical analysis does not provide support to this assumption. It may be that CVCs may be discouraged by the presence of a significant patent stock. Learning relies on information and knowledge exchange from participants, usually tacitly (Granovetter, 1985). Startups with a patent stock have more control in the relationship's learning processes (Adegbesan and Higgings, 2011), decreasing the CVCs' incentives to commit their resources. Corporates will have fewer windows on technologies and lower learning benefits. It follows that CVCs may prefer to enter in a relationship with startups having a lower patent stock as the potential learning upsides are higher than in the opposite case.

Chapter 5

Hypotheses

5.1 Literature Limitations on CVC Impact on Firms' Performances

The empirical analysis of the CVCs impact on portfolio companies reveals that mixed and incomplete results are the norm. For example, concerning the innovation output, several authors supported the thesis of a positive relationship between CVCs and innovation performances (Chemmanur et al., 2014; Alvarez-Garrido and Dushnitsky, 2016), other argued that compared to different types of venture capitalists, their impact is neutral (Pahnke et al., 2015; Wang et al., 2019). Regarding the exit rate, some authors underline the increase in exit probability for CVC-backed firms (Chemmanur and Loutskina, 2008; Guo et al., 2015) while others questioned the results providing evidence about a neutral impact or at least as equal as of IVCs' one (Gompers and Lerner, 2000; Dushnitsky and Shapira, 2010). Results concerning OEP are often incomplete too. Some studies analyse only startups' post-IPO performances, paving the way for a survivorship bias (Chemmanur and Loutskina, 2008). Only Colombo and Murtinu (2017) carried out a complete analysis that breaks down the pre and post-funding OEP.

All the studies mentioned above missed to factor in one element debated in the CVC domains: heterogeneity. CVC can widely differ among each other leading to different results for the parties involved. In the empirics discussed in the previous chapters, some authors detected this pattern. Gompers and Lerner (2002) underlined how the differences in CVCs objectives, i.e., strategic vs financial, can influence the funds' impact in increasing exit. Yang (2012) considered the governance structure and the role it plays in shaping the dyadic relationship. She analyses how it can influence the startups' exit probability and innovation rate.

Unluckily, the literature is completely missing an overarching study encompassing the different impact CVCs may have on the startup economic and financial performances according to their specific characteristics.

5.2 Heterogeneity

Scholars classifying corporate units along several dimension acknowledge heterogeneity within the CVC market. Chesbrough (2002) considered the relatedness between the dyad operational capabilities and the CVCs final objectives to cluster each investment adopting a portfolio-like view. Zu Knyphausen-Aufseß (2010) thought of the corporate origin and profile as the source of heterogeneity. Rohm et al. (2017) argued that the fund's intrinsic motivation is the differentiator; in other words, whether they are focused on financial objectives, strategic objectives, or both. Gutmann et al. (2019) suggested that the CVCs' operating activities play a critical role for the portfolio firms, namely value-creation services and value-capturing. Lastly, Rossi et al. (2019) considered the type of activities carried out in terms of involvement within the startups daily jobs and the degree of exploration/exploitation in their investments.

All the variables adopted can be considered complementary and ascribed to the corporate venturing unit's whole strategy and governance (Dushnitsky, 2011). They are summarised in four macro categories by:

- i) program structure, i.e., dependency and relationship with the corporate
- ii) level of autonomy over the fund/s
- iii) KPIs to evaluate the program, i.e., strategic vs financial focus, long-term vs short-term, etc.
- iv) personnel involved and their compensation scheme.

5.2.1 Heterogeneity: Strategy and Governance vs Organisational Structure

The four variables aforementioned depend on high-level decisions made by the TMT of the parent companies and directly shape the CVC internal organisation. At the moment, Souitaris et al. (2012) proposed the most overarching classification by identifying the two CVC dichotomous organisation structures: exoisomorph and endoisomorph.

On one side, the corporate may opt for an IVC-style of organising work for their corporate fund. In other words, they set up an organic organisation (Mintzberg, 1979) that favour low formalisation and standardisation of processes, broad and shared responsibility and a bottom-up communication style. As these practices are typical of entities other than the parent company, the authors defined them as exoisomorph (Souitaris et al., 2012).

Conversely, the CVC can mimic the corporate organisation structure. They have more formal and standard processes, high specialisation and centralisation, and a top-down communication style. As these practices' sources came directly from within the parent, the authors defined them as endoisomorph (Souitaris et al., 2012).

For the CVC to properly work, there should be consistency between the broad strategic objectives identified in the governance and the organisational profile adopted (Hill and Birkinshaw, 2008). The definition of the corporate strategic objectives will consequently determine the ideal types of organisational set up to implement (Hill and Birkinshaw, 2008). Nevertheless, the relationship is bidirectional. The information coming from the organisational side has the power to influence the strategy definition. The two elements are mutually constraining forces as for a given strategy exists a limited number of suitable structures and vice versa (Drazin and Van de Ven, 1985). Therefore, following a pure Darwinian selection mechanism, organisations that do not obtain this fit will either adapt by imitation or exit the market (Di Maggio and Powell, 1983). CVCs that obtain such fit tend to experience more consistent internal interrelationships between their components (Doty and Glick, 1994; Drazin and Van de Ven, 1985). For example, the unit employees will experience benefits in their daily activities, such as clarity in the vision or greater coordination (Miller, 1996). As a direct consequence, such funds can obtain greater performances (Hill and Birkinshaw, 2008).

5.2.2 Heterogeneity: How Practices Can Change

Heterogeneity has the power to influence investment activities as well. The existence of different practices in a specific institutional field, i.e., an industry, is the consequence of different logics (Pache and Santos, 2010; Greenwood et al., 2011; Thornton, Ocasio, and Lounsbury, 2012). The CVC world represents no exception. Different logics proved to shape

the traditional venture practices over the deal flow, starting from the origination and ending with the deal-monitoring and value-adding activities (Soutaris and Zerbinati, 2014). Fischer et al. (2019) investigated the issue by adopting an agency theory lens. According to them, the CVC managers and the TMT will set up the CVC unit's practices to reduce the agency between them. In other words, the parent company undertakes high-level decisions in terms of goals, structures, staffing, and relationship management. These will determine the level of uncertainty - and therefore, risk - that they can bear, i.e., magnitude of the agency issues accepted. Consequently, they can define the most appropriate activities to manage the information asymmetries better.

They detected six agency conditions to study the CVC case, namely:

- i) Carried interest, whether the CVC managers receive a profit share from investment which is responsible for (Hill et al., 2009)
- ii) Decision-making autonomy, the degree of freedom that managers have in their investment decisions
- iii) Strategic fit, whether the targeted startups belong to the same industry of the parent corporations
- iv) Strategic support, the involvement of the CVC manager in startups decisions
- v) Strategic goals, the extent to which the investment goals are related to the parent's strategy
- vi) Financial goals, the extent to which the investments goals are focused on obtaining a return on the investment.

These elements should be in harmony among them to obtain higher performances. Potential inconsistency can jeopardise the smooth running of the fund. For this reason, the authors investigated the interplay between them and the survival of the CVC unit. First of all, what emerged is that an upfront goal alignment, i.e., strategic vs financial, is not crucial per se for the unit's survival; what is most determinant is the capability of the CVC unit to adapt to those practices most suited for achieving those goals. Secondly, the practices have to guarantee to obtain an alignment in terms of risk preferences between the agent (CVC managers) and the principal (TMT), i.e., reducing the agency problem (Benson and Ziedonis, 2010).

Consequently, risks level and CVC unit goals are intertwined, and the TMT has to consider this interrelationship when setting up the fund. More precisely, objectives directly influence the spectrum of potential targets and, therefore, the investment's uncertainty, i.e., they play a

crucial role in determining the behaviour of risk-sensitive agents (CVC managers). For example, strategic goals for the units may force them to invest in startups with a lower strategic fit to gain early access to new technology (Benson and Ziedonis, 2009; Dushnitsky and Lenox, 2006; van de Vrande and Vanhaverbeke, 2013), increasing the level of the investments' uncertainty. Even though the TMT demands explorative investments, CVC managers may not fund them outside the acceptable risk threshold. The TMT can adopt some leverages to increase this threshold, such as carried interest, more autonomy or guaranteeing to investment managers a board seat in invested companies.

It becomes clear that the strategic goals, organisational structure and investment practices are highly intertwined. More precisely, the strategic goals and the organisational structure have proved to have a mutually influencing relationship (Hill and Birkinshaw, 2008), which affect their ability to deal with different targeted startups (Fischer et al., 2019).

5.2.3 Heterogeneity: What is Missing in the Analysis?

Several authors demonstrated how strategic and, therefore, organisational choices could affect the impact on portfolio firms. On the strategy side, there is ample evidence in the literature. For example, several authors proved how CVC strategic goals increase board representation, the premium required by the startups, the investment stage (Masulis and Nahata, 2009), and the likelihood of the startups' exit (Gompers and Lerner, 2000). However, the literature is missing to consider the organisational factors in their equation. The primary question practitioners ask themselves is whether a peculiar CVC structure allows running investment practices better to improve the unit results and increase the impact on startups' economic and financial performances.

Before addressing this question, it is necessary to take a step back and analyse the key peculiarities that differentiate CVCs from other funds. Each type of funds (e.g., CVC, IVC, GVC) distinguishes itself via additional non-monetary value-adding services (Hsu, 2006). CVCs are well-recognised in the industry thanks to their ability to:

- i) Provide complementary assets, which are crucial in the initial stage of development (Parker and Steensma, 2012)
- ii) Provide in-depth knowledge about the market and the technology (Maula et al., 2005)

- iii) Access to a broad network of customers and suppliers (e.g., Chesbrough, 2002)
- iv) Act as a stamp of approval and overcome the liability of newness in the industry (e.g., McNelly, 1997; Stuart et., 1999; Maula, 2001)
- v) Provide long term support to startups (Pahnke et al., 2015).

These characteristics are connected to the captive nature of CVCs. They are more focused on strategic rather than financial results, i.e., to add strategic value to the parent by tapping into the portfolio firms' innovations via frequent interactions (e.g., Sykes, 1990; McNally, 1997; Kann, 2000; Ernst and Young, 2002; Keil, 2002). However, for the same strategic objectives, problems may arise. The startups may be afraid of misalignments between their strategic objectives and the CVC fund' ones (e.g., Zu Knyphausen-Aufseß, 2010) or of the so-called misappropriation risks (Katila et al., 2008). Lastly, several drawbacks link to the organisational influence that the corporate may have as a consequence of a close working relationship (Soutaris et al., 2012). More precisely, the institutional pressure coming from the parent (Di Maggio and Powell, 1983) and CVC managers with previous corporate experience (Dokko and Gaba, 2012) can force the CVC unit to seek legitimacy by adopting corporate practices (Soutaris et al., 2012). The adoption of a corporate model, i.e., endoisomorph organisation, has been considered by scholars often ill-suited for investment funds, especially for what concerns:

- i) Payment schemes that have the potential to affect talent attraction and retention (Gompers and Lerner, 2002)
- ii) Inter-organisational conflicts (Sykes, 1990)
- iii) Lack of time-constraints on the investments (Gompers and Lerner, 1996)

These may limit the ability to provide high-quality value-adding services as IVCs do.

The other option CVCs have is to try to adopt an IVCs-like organisational structure. However, this entails some complications too. First of all, replicating such an organisational structure has been considered not straight forward (e.g., Gompers and Lerner, 2000). For example, top managers with prior VCs experience that can shape the organisational structure and practices are challenging to attract without high-powered compensations schemes (Lawler and Drexel 1980; Block and Ornati 1987; Dushnitsky and Shapira, 2010). However, the adoption of carried interest may generate tensions within the corporate itself, in terms of payment equality (Corporate Venturing Directory & Yearbook, 2001) and objectives alignment as CVC managers would be tempted to carry out financial rather than strategic investments (Hendry, 2002). In

the hypothesis that they would be able to attract top investment managers, the corporate should ensure their dedication to the parent strategic goals. Managers with past IVC experience can steer the CVC unit far away from the strategic ambitions and make it resemble a traditional VC (Dokko and Gaba, 2012). All these elements can induce the startup to question the potential benefits of entering into such a relationship (Hellmann, 2002).

To conclude, the trade-off is evident, and, as far as now, there is no evidence supporting either one or the other thesis. It becomes necessary to understand whether one of the two formulae yields better results than the other.

Hypothesis 1

Starting from Hill and Birkinshaw (2008) and Souitaris et al. (2012), the first hypothesis investigates the interrelationship between goals and organisational structure. It aims at understanding if there is an organisational structure to better support CVCs activities. More precisely, supporting the thesis that CVC with strategic goals can provide more support to portfolio firms, it becomes crucial to understand whether they can work with an IVC-like structure considered the most suited for venture investing or mimic the corporate one. The coherence between the strategic intent and the organisational structure is crucial for deploying activities and determining the impact the CVCs can generate vis-à-vis other venture funds on the startups' performances. The first hypothesis aims at deep-diving into such interplay between the variables.

Firstly, it becomes necessary to test what is the best organisational structure that, ex-ante, provides the higher value-adding benefits to startups. Leveraging on the literature (e.g. Gompers and Lerner, 2000; Dushnitsky and Shapira, 2010), the first hypothesis wanted to test whether the IVC-like organisational model is superior than the corporate-like one:

H1: CVC w have a greater impact on portfolio firms when they adopt an exoisomorph organisational structure rather than an ex endoisomorph one

Secondly, it becomes necessary to confirm the greater value-adding benefits of strategic CVCs with the following hypothesis:

H2: CVC with strategic objectives have a greater impact on portfolio firms compared to their peers

Subsequently, to understand whether an organisation structure can enhance strategic CVCs' value-adding benefits, the following hypotheses are formulated.

H2.a: CVC with strategic objectives have a greater impact on portfolio firms when they adopt an endoisomorph organisational structure rather than an exoisomorph one

H2.b: CVC with strategic objectives have a greater impact on portfolio firms when they adopt an exoisomorph organisational structure rather than an endoisomorph one

Hypothesis 2

On the other hand, it is reasonable to argue that the organisational structure can have different levels of effectiveness according to the typology of startups in the portfolio (Fischer et al., 2019). In other words, the corporate should tailor the organisational structure to the investment strategy as it directly represents the parent's goals. In the literature, several pieces of evidence suggest that CVCs investment should be made in startups with a strategic fit, i.e., startups operating in a similar industry and with complementary objectives. It should guarantee to greatly enhance startups' success rate by aligning the incentives between the parties (Gompers and Lerner, 2000; Gompers, 2002; Hellmann, 2002; Ivanov and Xie, 2010). The second hypothesis aims at investigating the relationship between the two variables.

Firstly, as done before, it is necessary to confirm the strategic fit positive role as a baseline hypothesis:

H3: CVC have a greater impact on portfolio firms in the presence of a strategic between them and the funded venture than in the opposite case

Subsequently, it becomes interesting to understand whether an organisational setting may better support this investment strategy:

H3.a: CVC have a greater impact on portfolio firms when they adopt an endoisomorph organisational structure rather than an exoisomorph in the presence of a strategic fit between them and the funded venture

H2.b: CVC have a greater impact on portfolio firms when they adopt an exoisomorph organisational structure rather than an endoisomorph in the presence of a strategic fit between them and the funded venture

Chapter 6

Designing the Dataset

The final data is a panel dataset and is the result of a merge between different information sources.

First of all, the analysis's cornerstone is VICO, a European project aimed at tracking VC investment in Europe to evaluate the impact venture capitalists have on startups. The dataset maps new ventures operating in the high-tech sector between 1998 and 2016. Besides, VICO provides also investors data such as name, sectors, and geography.

Secondly, VICO has been merged with Orbis. Orbis provides firm-specific information concerning financial and non-financial elements (e.g., headcounts, assets, revenues, liabilities).

Thirdly, it was necessary to carry out a matching procedure for measuring the impact a VC investment has on the portfolio firms. More precisely, each VC-backed firm was paired to another not-VC-backed firm having similar characteristics in terms of age, headcounts, and financials.

After these three merging procedures, the dataset results composed of 50.075 observations. Each observation corresponds to an investment round. Early-stage rounds represent most of the entities, but late-stage investments are included – the latest round is the 8th. The total number of startups is 5696. Two thousand eight hundred forty-eight out of those received funding from a VC investor; the remaining ones are not VC-backed. Since the thesis's interest relates to evaluating VCs' impact regardless of the startups' stage, there were not cleaning procedures concerning the startups' size or round.

Lastly, it was necessary to carry out some desk research on CVCs. Data about their autonomy and mission were gathered by looking at the funds' website. They were instrumental in capturing CVCs heterogeneity and subsequently mapping its impact on portfolio firms. More

precisely, concerning autonomy, CVCs' legal status information was collected, i.e., whether the fund was a BUs or a separated entity. Regarding the CVCs' strategy, an analysis of their website allows understanding the CVC funds' strategic orientation.

6.1 Data Modelling

Before proceeding with the analysis, data preparation procedures were carried out.

First, growth measures of numerical variables concerning financial and non-financial measures were computed, more precisely on sales, EBIT, EBITDA, numbers of employees, company's ages, and total assets. A logarithmic term was applied, and a Year-on-Year difference computed for each of them.

Secondly, both the absolute value and the numerical variables' growth rate presented skewed distributions, and outliers would invalidate the analysis. Therefore, data cleaning procedures were necessary. More precisely, the absolute measures were logarithmic-transformed and winsorised. On the other hand, only a winsorisation was required for the growth measures as they were already in a logarithmic form.

New categorical variables were created to capture VCs funding activities.

Firstly, concerning the VCs type, a relevant number of observations are collected regarding IVCs, CVCs, BVCs, and GVCs investments. They were encoded into four new step variables: IVC_step, CVC_step, BVC_step, and GVC_step.

Secondly, in the panel data, CVCs were classified according to their mission as either financial, strategic, or unfocused, i.e., pursuing both strategic and financial goals. It was necessary to encode the dummy variable CVC_goal to include these pieces of information. CVC_goal has a value of 0 when the objective is financial, 1 when it is strategic, and 2 when it is both. However, it is vital to capture the imprinting effect that CVCs with different missions have on their portfolio companies. Therefore, it leads to generate three step variables, i.e., CVC_financial_step, CVC_strategic_step, and CVC_both.

Thirdly, it was necessary to control the organisational structure of CVC funds. The dataset provides relevant information on the topic by classifying CVCs as:

- i) Dedicated funds, i.e., the corporate sets up a dedicated investment vehicle
- ii) CVC arm, i.e., the corporate creates a controlled venture capital entity

- iii) Corporation, i.e., the corporate directly invest in the new ventures
- iv) Corporation-CVC arm, i.e., the corporate, has no clear corporate venturing structure and may invest balance sheet cash via a CVC BUs.

Such information on the funds' autonomy is a good proxy for capturing their organisational tendencies, i.e., exoisomorph or endoisomorph (Souitaris et al., 2012). Therefore, at first, the dummy CVC_autonomyd was computed. It values 1 when the CVCs are exoisomorph, i.e., for Dedicated Fund or a CVC-arm, and 0 in the endoisomorph instances, i.e., for Corporation and Corporation-CVC arm. Subsequently, two step dummy variables were defined to capture the impact of different organisational models on the portfolio firms' performance: CVC_exo, controlling for exoisomorph CVCs and CVC_endo, controlling for the endoisomorph ones.

Fourthly, a matching procedure was carried out to identify the strategic fit between the corporate investor and the investee. As suggested by Gompers and Lerner (2000), the dyad can be considered in a strategic fit when there is the possibility to start a potential customer-supplier relationship. It is reasonable to assume that this is more likely to happen when the dyad operates in a similar domain. Therefore, to capture the phenomenon, a strategic fit measure was built by leveraging the panel data's NACE code. The NACE code is a string of number whose first digit identifies a firm's sector (e.g., manufacturing), and whose subsequent ones identify sectors' sub-categories (e.g., manufacturing of food products). It is worth noting that startups and investors may have more than one code. After extrapolating the sector information via the first digit in the NACE string, the dyads were compared and matched when they had at least a joint sector. The result was the dummy DyadStrategicFit. It has a value of 1 when there is a strategic fit and 0 in the opposite case. Lastly, the data modelling procedure creates two time-invariant dummy step variables, namely, CVC_strat_fit_step and CVC_strat_unfit_step, to map the impact strategic fit has vis-à-vis strategic unfit. Lastly, the most representative sectors' dummy variables were created to control for them in the regression model. After analysing the main NACE code in the database, it was possible to identify seven macro-sectors:

- i) Biotechnology
- ii) Medical, Health, and Life Science
- iii) R&D and Engineering
- iv) High-tech Manufacturing
- v) Internet

- vi) Media
- vii) Medium-Low Tech

After these procedures, the dataset was ready to be explored and prepared for the analysis.

6.2 Descriptive Statistics

The following section provides a detailed description of the panel data. In the first part, an introduction of the VICO will set the stage. VICO represents the starting point of the analysis as it provides the majority of information deployed, i.e., investment rounds and investors type.

The second part presents the results of the descriptive analyses of both startups and investors. More precisely, it discusses information regarding startups' geography, sector, stage, and financial performances, as well as investors' type, geography, and investment behaviour.

6.2.1 VICO

VICO is the results of a European project aimed at building a data infrastructure to study worldwide VCs' impact on pan-European high-tech startups. The EU Commission has financed VICO as part of the 7th European Framework Program. The database's first edition was released in 2008 and has advanced until the VICO 5.0 - the one adopted for the thesis' analysis.

Data Collection

Nine research centres have been carrying out the VICO's data collection:

- i) Armines – Ecole des Mines de Paris (France)
- ii) Centre for European Economic Research (Germany)
- iii) Ghent University (Belgium)
- iv) Politecnio di Milano (Italy)
- v) Research Institute of the Finnish Economy (Finland)
- vi) Universidad Complutense de Madrid (Spain)
- vii) Università Carlo Cattaneo (Italy)
- viii) University College London (United Kingdom)
- ix) Vlerick Leuven Management School (Belgium)

Each university is responsible for manually verifies its data. After this screening, data are gathered, and the last manual check is undertaken at the central level. The initial layer of the database originates from official sources' data, and web-based surveys complement them. The official sources for new ventures' data are Thompson One Private Equity, Zephyr, and Crunchbase. They provide comparable financial information, press releases, and websites for European companies - both private and public.

VICO's Startups

The database gathers time-series information on startups. New ventures are eligible to be included if they meet three criteria:

- i) Younger than 20 years olds
- ii) Operate in the high-tech sector
- iii) Absence of majority shareholders without considering the founding team.

Initially, the startups' countries were seven, namely, Belgium, Finland, Germany, Italy, Spain, and the United Kingdom. In VICO 5.0, the sample has expanded. Almost all the pan-European area is covered. The nations represented are Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom.

The total number of startups is 2848.

VICO Investors

VentureXpert provides investors' data – the most extensive database of private equity and venture capital funds data. External information from annual reports, investors websites, IPO prospectuses, local and European VC association, and press releases complement the database. VICO 5.0 includes 1454 investors, a considerable increase compared to 1125 in VICO 1.0.

6.2.2 Thesis Data Sample

Before defining the regression models, it was necessary to carry out a univariate analysis on both the investors and the investees.

Startups

The panel data registers 5696 new ventures. Two thousand eight-hundred forty-eight out of those have received VC funding. As previously mentioned, they are headquartered in the Pan-European area. The remaining counterpart is composed of not-VC-funded new ventures with comparable financial and non-financial characteristics to VC-funded ones.

The subsequent descriptive analysis will focus on the VC-financed subset.

The startups spreads over 27 countries (Figure n.12; n.13), with France (32,13%), United Kingdom (13,80%), Germany (11,03%), Spain (10,96%), and Sweden (8,67%) the five most represented countries. Conversely, the five least represented are Malta (0,01%), Slovenia (0,07%), Greece (0,07%), Luxemburg (0,11%), and Greece (0,18%)

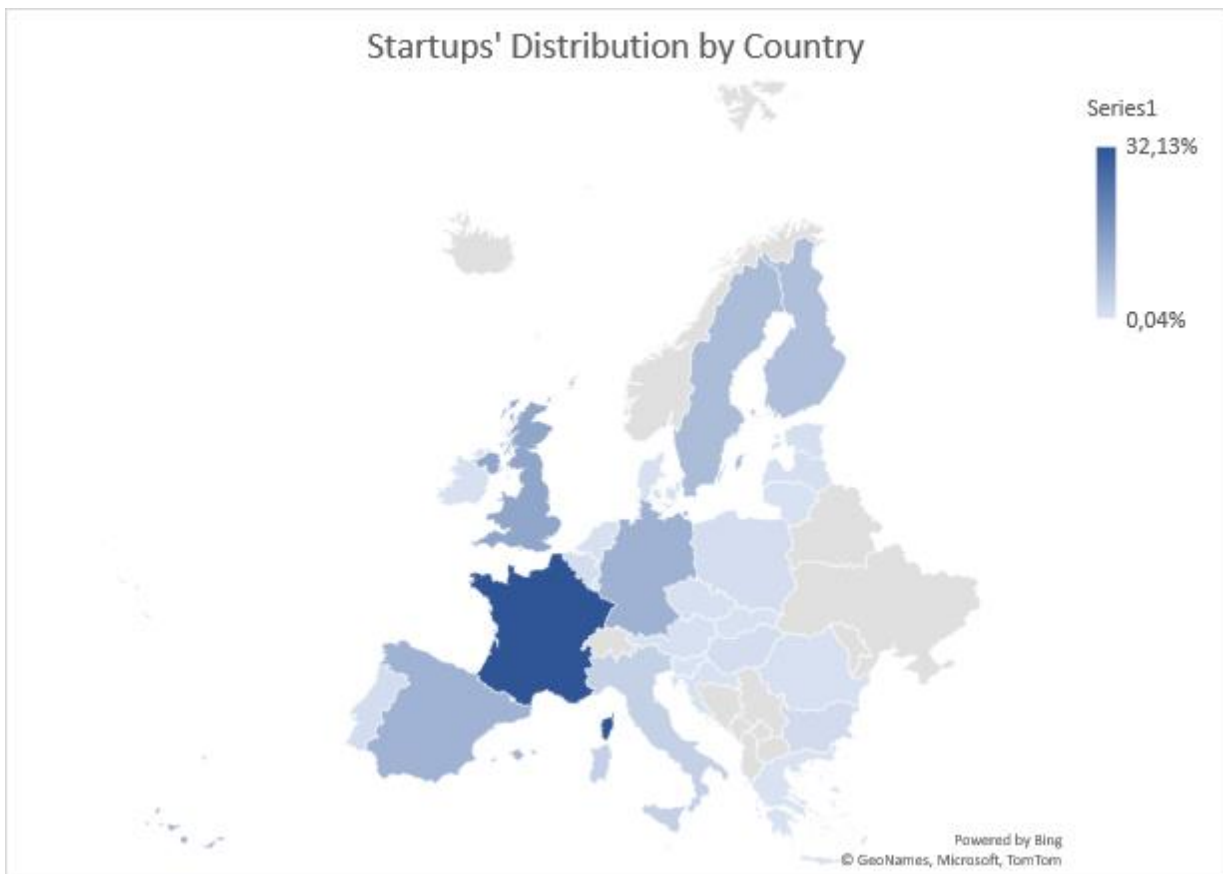


Fig. n.12 – Startups' Distribution by Country

Are Corporate Venture Capitalists Better at Improving the Portfolio Firms' Performances?
An Analysis of CVCs' Heterogeneity

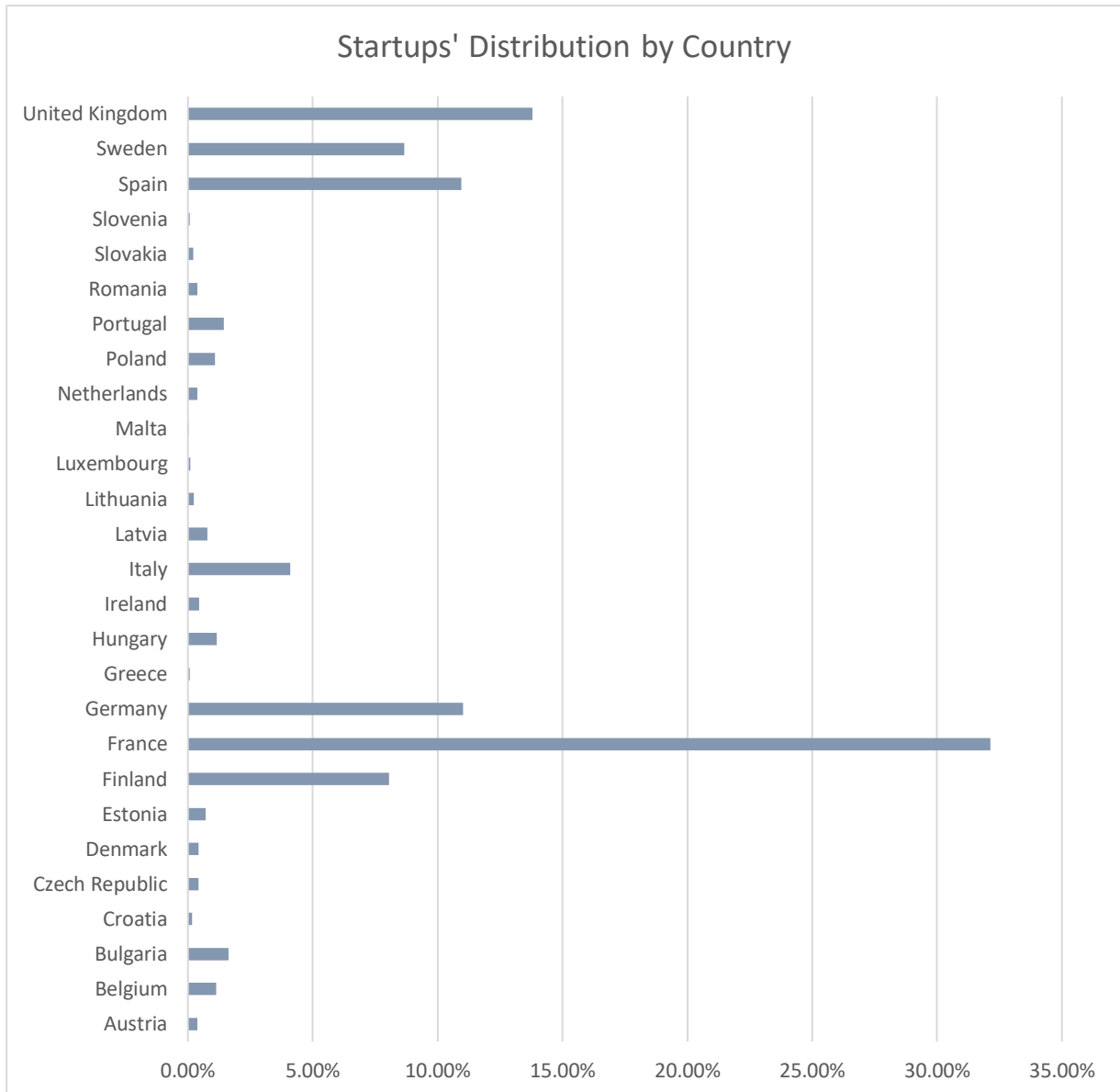


Fig. n.13 – Startups' Distribution by Country

The dataset includes information regarding startups founded in 1988 up to 2014 (Figure n.14). The average founding year is 2006. Conversely, most of the sample (53,09%) comprises startups incorporated between 2005 and 2010, with 2007 the most prolific year for founders (10,11%).

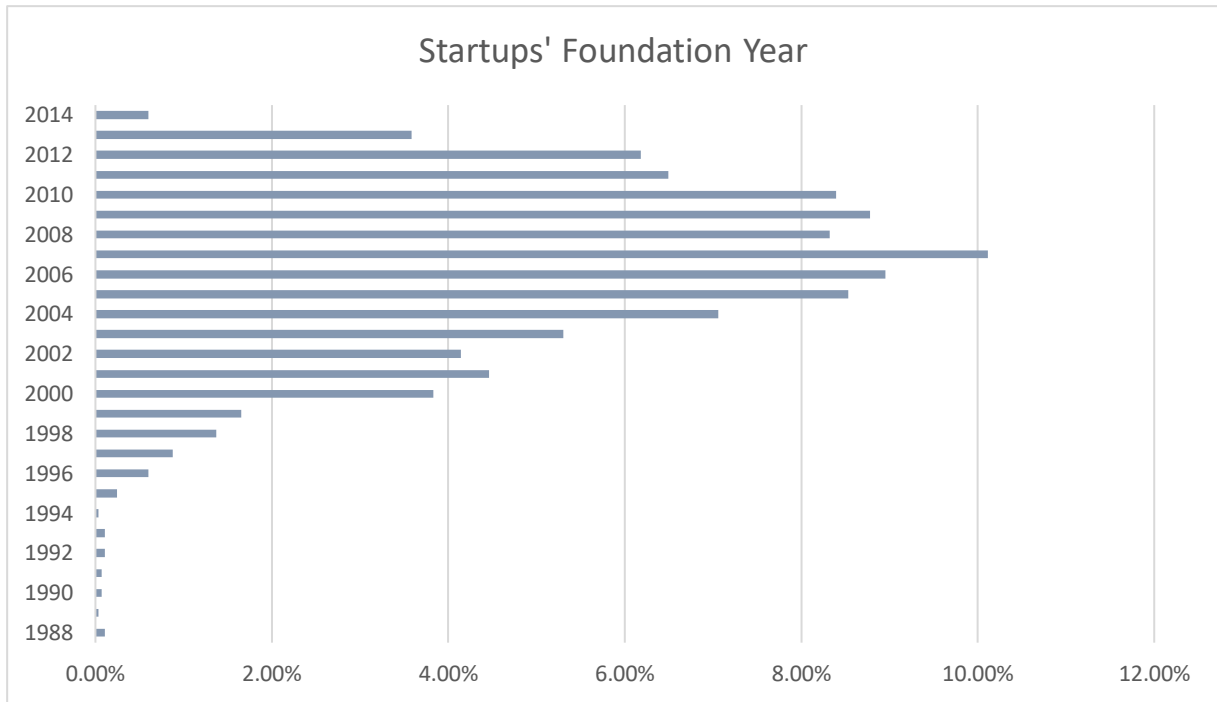


Fig. n. 14 – Startups' Foundation Year

Concerning the markets where VICO's startups operate, the most represented sectors are Internet (35,2%), medium-low tech (31,4%), and R&D and Engineering (12,5%) (Fig. n.15). These results are reasonable. The Internet has been a booming sector in the last twenty years. Medium-low tech initiatives are accessible without having top-notch hard-skills, increasing the pool of entrepreneurs entering the market. Lastly, the R&D and Engineering category represents the deep-tech soul of VICO. Nonetheless, its high-tech nature, biotechnology is underrepresented, with only 3,2% of startups in the sample. Media (4,1%) and Medical, Health, and Life Science (5,0%) follow to complete the three least-populated segments.

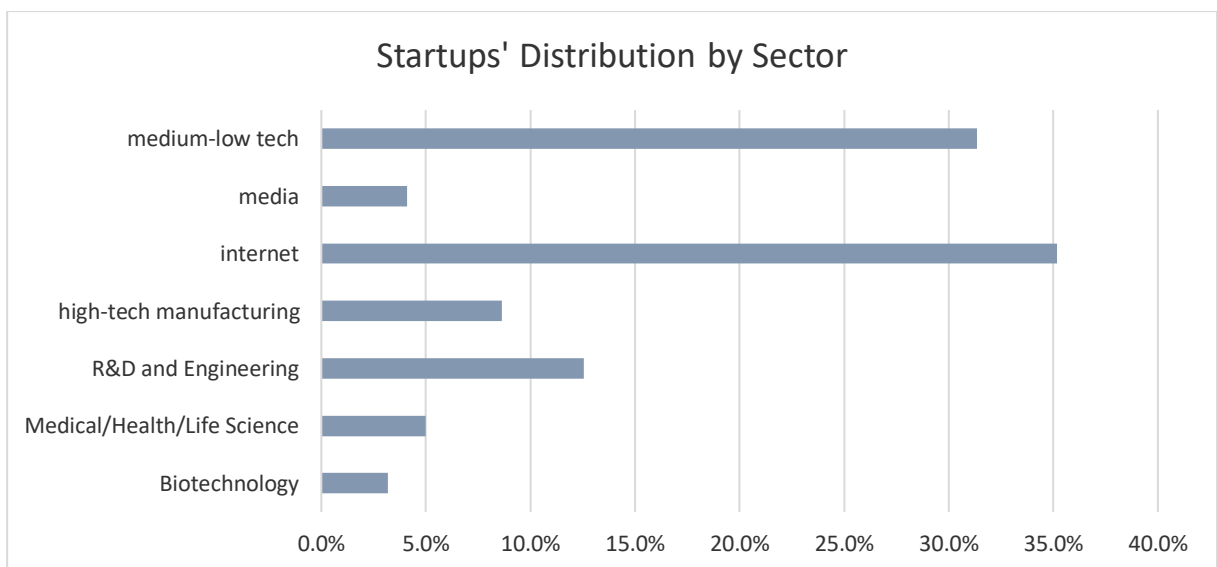


Fig. n.15 – Startups' Distribution by Sector

The startups founding activities concentrated in the last decade of the observed years (Fig. n.16). More precisely, 99,79 % of the first investment rounds have been raised between 2005 and 2014. Despite the 2008 crisis, the most active years for first funding activities are 2010 and 2011.

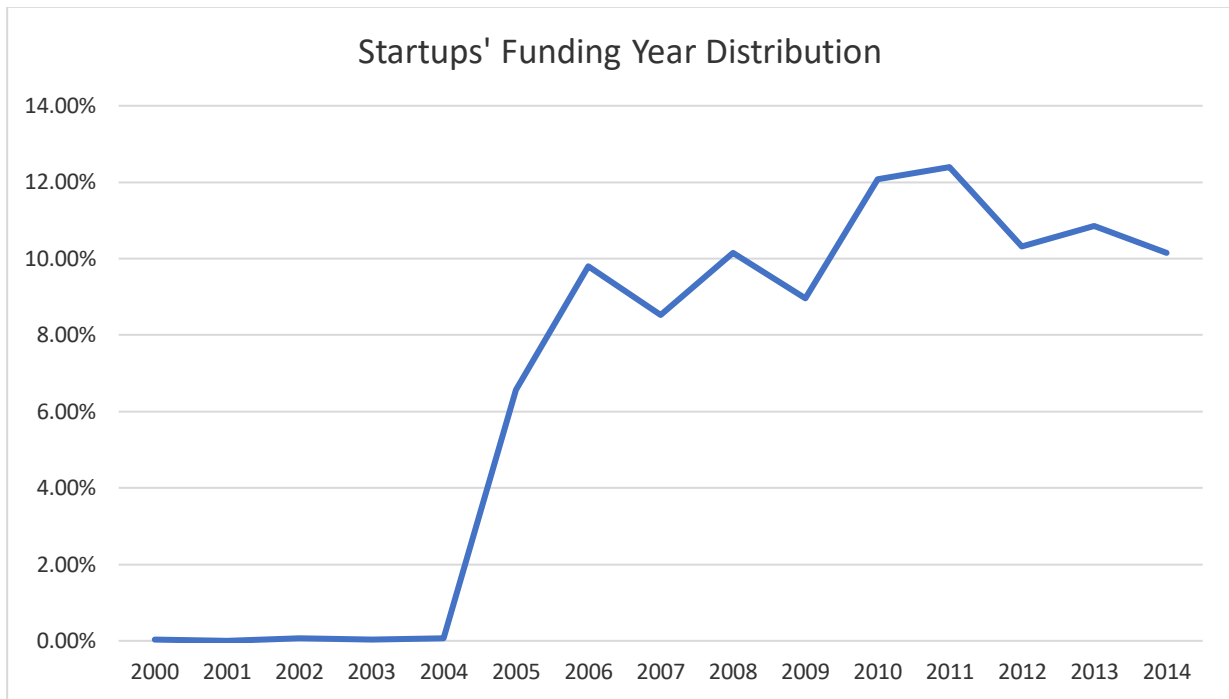


Fig. n.16 – Startups' Funding Year Distribution

On average, high-tech startups took three years to raise VC fund for the first time, with only the 3% of the sample waiting ten years. However, most of the sample (61,62%) has received funding after three years of their incorporation date. However, a substantial percentage (20,61%) has waited more than five years to be funded, highlighting the different high-tech startups' velocity compared to traditional ones.

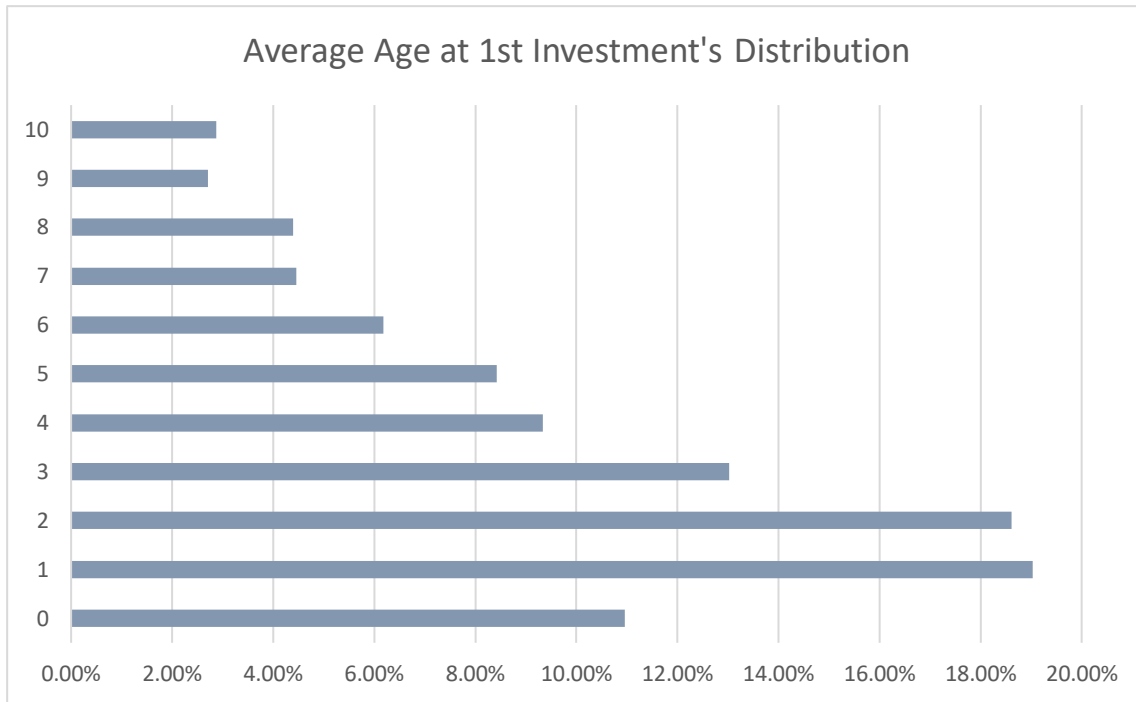


Fig. n.17 - Average Age at 1st Investment's Distribution

Investors

VICO's investors are worldwide VCs that have funded Pan-European companies. The countries represented are 38, spanning from North America and Asia to Europe. The most represented country is France with 187 funds, i.e., 20,44% of the total, followed by the United Kingdom (148; 16,17%), Germany (94; 10,27%), Spain (90; 9,84%), and the US (76; 8,31%). The latter presence underlines how the American VC market is highly mature and highly active in a distant geographical area, i.e., Europe. Conversely, the least represented counties are Greece, Israel, Japan, Korean Republic, Lithuania, Slovenia, and Turkey, with 1 (0,11%) investor per each.

Concerning the different categories of VCs, the most represented ones are IVCs with 1176 investors (80,9%), followed by CVC with 112 (7,7%), GVC with 81 (5,6%), BVC with 77 (5,32%), and UVC with 8 (0,6%) (Fig. n.18).

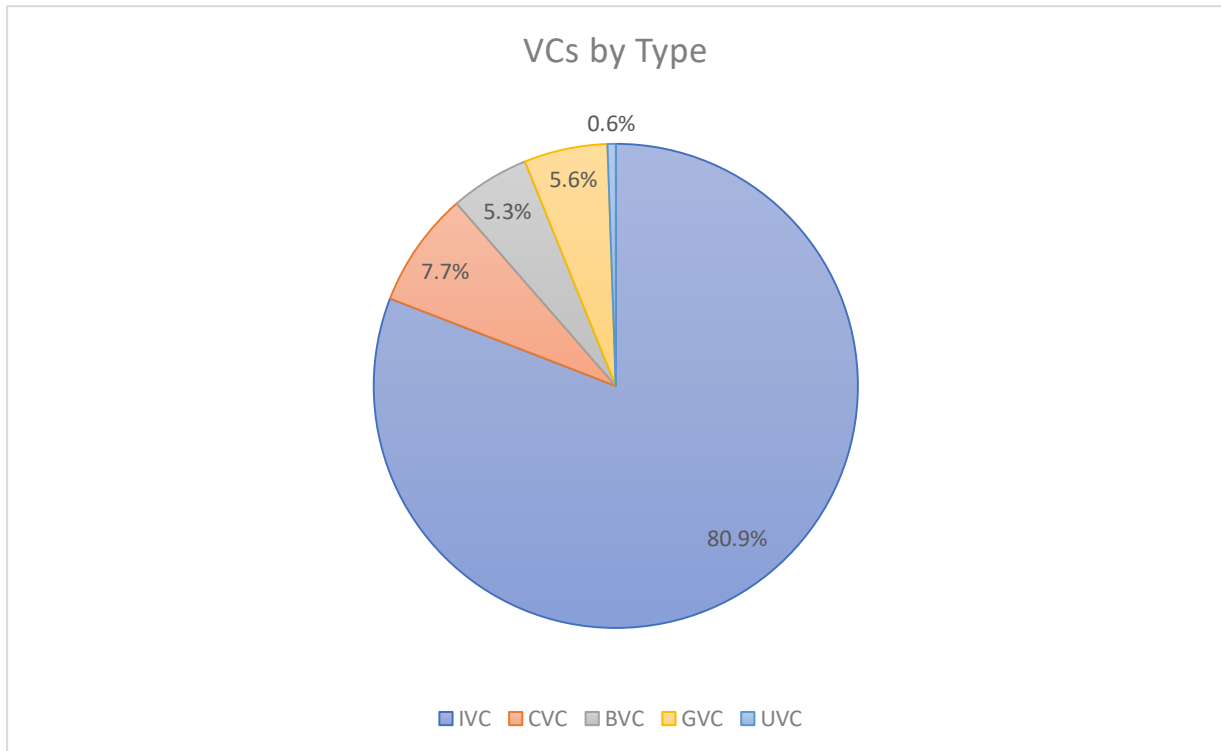


Fig. n.18 - VCs by Type

It was interesting analysing the distribution of different VCs type per countries. France, Germany, Spain, the United Kingdom, and the US, confirmed to have the most actives investors in all the categories. However, it is worth noting that the US, which misses the top five in the GVC and UVC categories to Belgium and Sweden. Such a result is reasonable, considering the local nature of GVC and UVC investment. On the other hand, the CVCs and BVCs's distribution is surprising: they are absent in many European Countries, e.g., Norway and Austria.

CVC-Focus

Before proceeding with the analysis, it was essential to explore CVCs data within the VICO better.

Concerning the CVCs geography, the international breath confirms. Corporate investments funded new ventures coming from the US, Asia, and Europe. The most active CVCs investors are headquartered in France (15 investors – 17,05%), Germany and the United Kingdom (11 investors each – 15,50%), Spain (10 investors – 11,36%), and lastly, the US (8 investors – 9,09%).

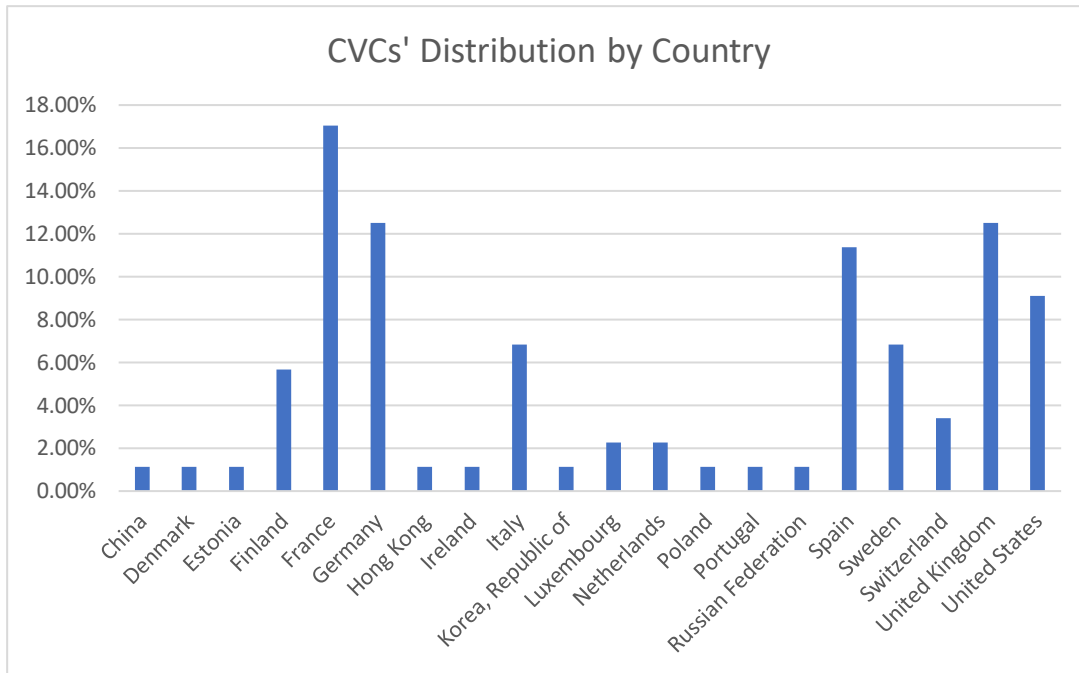


Fig. 19 – CVCs' Distribution by Country

Secondly, it was necessary to understand the sector of each corporate venture fund. According to the NACE code, VICO classifies them, and 17 industries have been identified. For the univariate analysis, eight categories were grouped (Fig. n.20):

- i) Software – 8,7%
- ii) Consultancy – 4,3%
- iii) Real Estate – 2,2%
- iv) Manufacturing – 6,5%
- v) Financial Services – 13%
- vi) Investment Fund – 58,7%
- vii) Media – 2,2%
- viii) Other – 4,3%

Strikingly, investment funds represent the majority of them (58,27%). This result signals the transition of CVCs from a corporate unit to a separate and dedicated investment vehicle. It is worth noting that the financial services include all the CVCs having a parent company operating in the finance sector, excluding insurance, banking, and pensions funds, which are classified as BVCs. The presence of consultancy-type CVCs supports the classification made by Zu Knyphausen-Aufseß (2010).

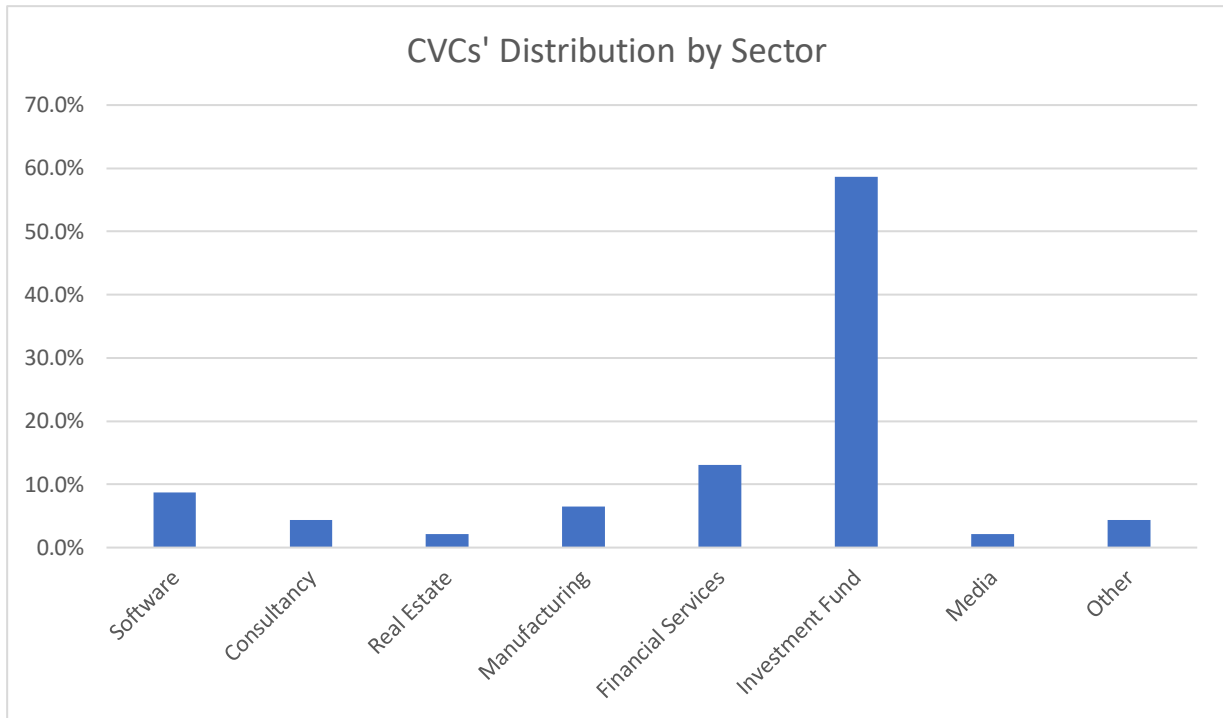


Fig. n.20 - CVCs' Distribution by Sector

Secondly, the analysis investigated two CVC structural characteristics, namely, CVC objectives and autonomy level.

Concerning the CVC objectives, the breakdown in the sample sees – as assumed by the literature – a majority of Strategic CVC (55,17%), followed by the "Both" one, i.e., those coupling financial and strategic objectives (24,14%). The least represented category is Financial one (20,69%) (Fig. n.21).

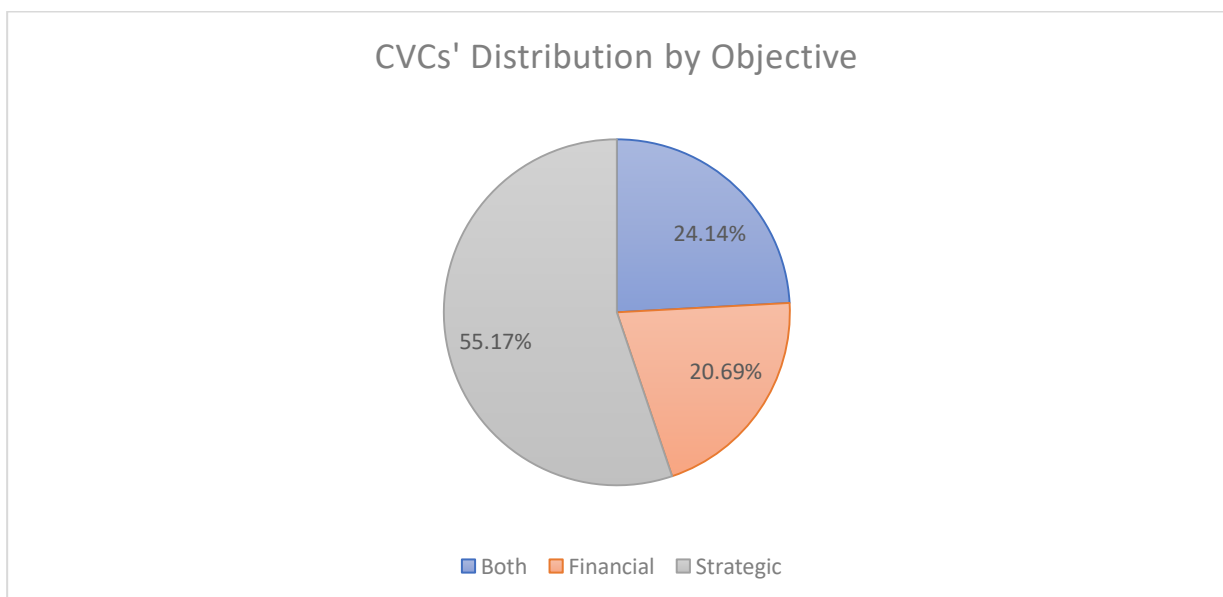


Fig. n.21 – CVCs' Distribution by Objective

Regarding the CVC Autonomy, the most common organisational structure is the CVC Arm (65,63%), followed by Corporate direct investment (18,75%). The least represented are the Dedicated Funds (9,38%) and the hybrid model, i.e., Corporation-CVC Arm (6,25%) (Fig. n.22). Summing up adopting the autonomy classification introduced in the data modelling chapter, the sample comprises 75% CVC Exoisomorph and the remaining 25% of CVCs Endoisomorph (Fig. n.23). This result underlines how CVCs are shifting even more towards an IVC-like structure.

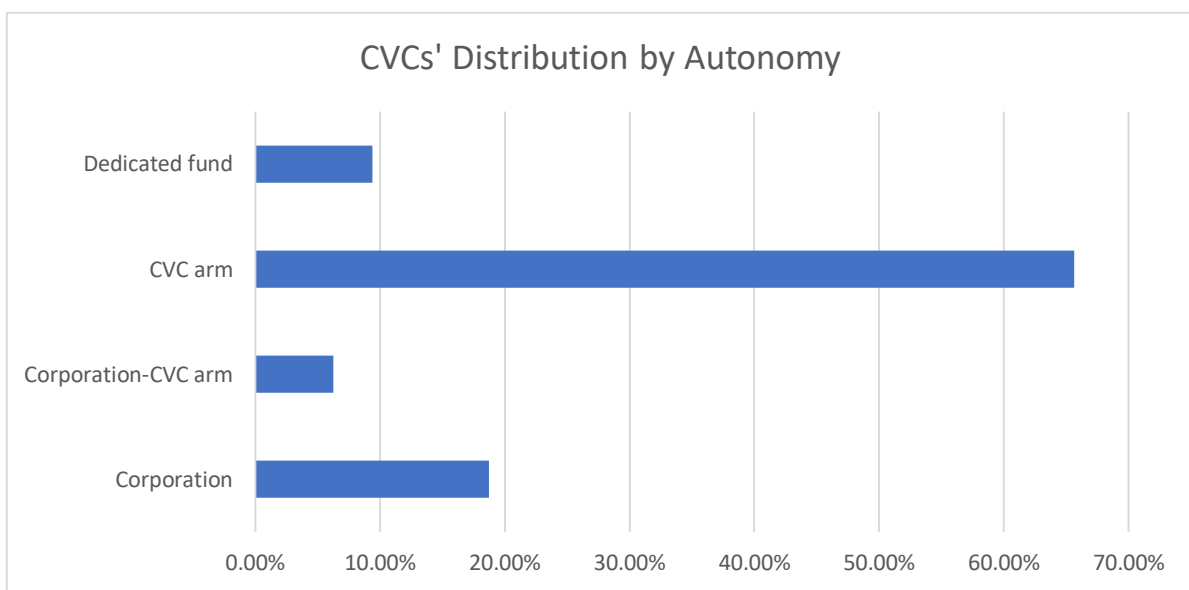


Fig. n.22 - CVCs' Distribution by Autonomy

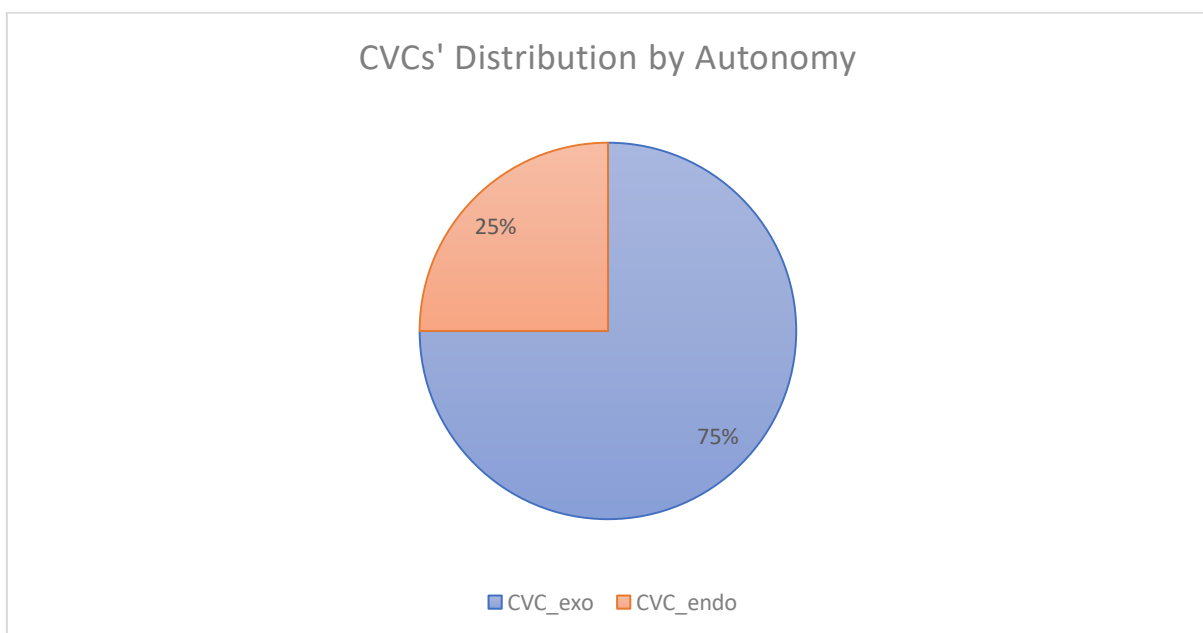


Fig. n.23 - CVCs' Distribution by Autonomy

Recalling the work of Hill and Birkinshaw (2008), the decision to adopt a specific organisational structure may correlate with the strategic goals that the corporate wants to pursue. Surprisingly, this pattern does not seem to hold in the descriptive analysis (Fig. n.24). The percentage of exoisomorphic structures is similar for both the strategic and financial categories. Only CVCs with a double focus seem to have a higher propensity to adopt an endoisomorph structure than the other two.

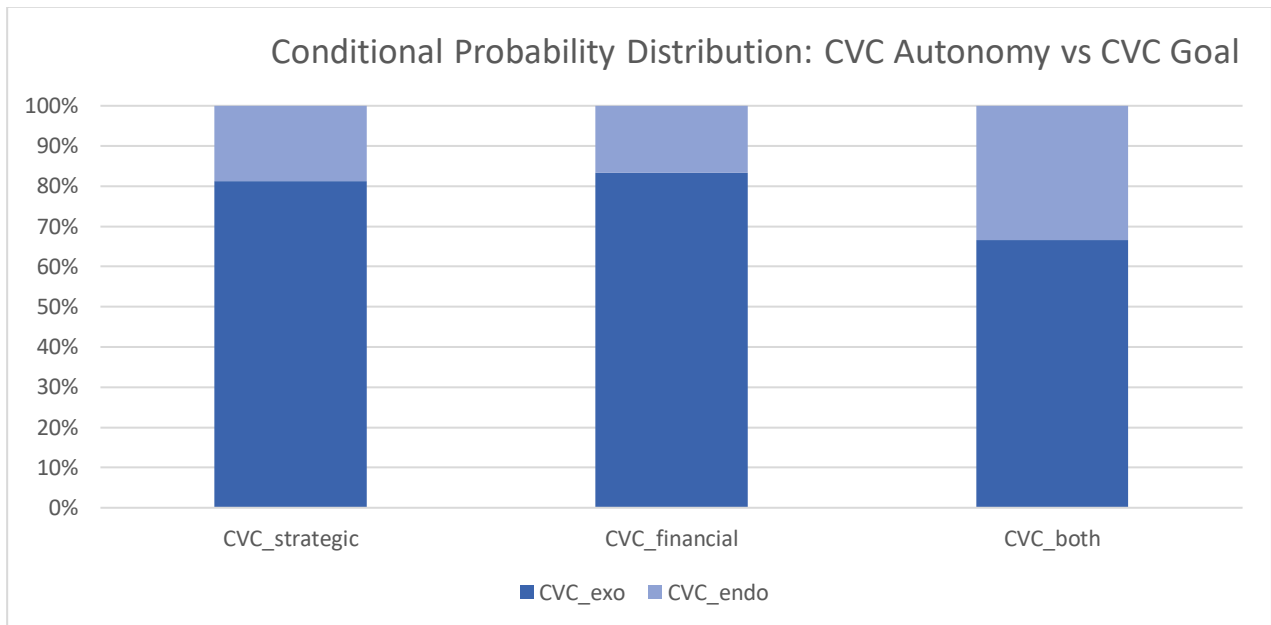


Fig. n.24 - Conditional Probability Distribution: CVC Autonomy vs CVC Goal

6.2.3 Investors Funding Activities and Impact on Startups

The new ventures' financial and non-financial characteristics are the last element to investigate in the univariate analysis. It would be crucial to understand how they change accordingly to the type of investors. On top of that, deal information complements the analysis.

Concerning company-specific metrics, the variables analysed are:

- i) Sales: a proxy for the commercial success of the company
- ii) Assets: a proxy to understand the internal development within the company
- iii) Employees: a proxy to understand the internal development within the company

For each variable, the analysis investigates both absolute and logarithmic growth measures. It is worth noting that profitability measures, e.g., EBIT, EBITDA, Profit, were not included as

they are absent - for VC-backed ventures - in the database. Lastly, to capture VCs worlds' skewness, no outliers cleaning procedure has been carried out in the univariate analysis.

On the other side, to complement the analysis, two elements were further described:

- i) Deal Size: it is an excellent proxy to understand the equity stimulus the startups is receiving, but also the risk propensity of different funds
- ii) Age at First Investment: it helps frame which type of startups the different VCs target, i.e., their investment strategy.

It is worth noting that all the univariate analysis divides into two parts. First, they focuses on the startups' performances over the observed period (1998 and 2016); subsequently, they deep dive into the pre and post-investment results.

VCS Type

The first element to analyse concerns the impact that different VC type have on portfolio companies. More specifically, how CVC-backed perform compared to IVCs, GVCs, and BVCs.

The first financial KPI considered is sales (Tab. n.10). The analysis showed that CVC-backed average sales value is more significant than IVC-backed. Therefore, considering revenues as a proxy for product-market fit, this may imply that CVC portfolios are composed of, on average, more mature and secure companies compared to IVCs. This result is a shift in trend compared to what found by Bertoni et al. (2015a). The authors stated that - in Europe - earlier stage companies are targeted by independent CVCs due to IVCs immaturity. However, it seems that the European IVCs market has matured and can take on early-stage investing challenges. GVCs seems to support pre-seed startups. While BVCs have in portfolio usually a late-stage investor, as suggested by Bertoni et al. (2015a).

Recalling that the relationship between sales and assets or employees is not linear, it is interesting to see that - despite the average sales of IVC-backed startups are four times lower - the CVC-backed assets are only 50% bigger. The same happens for assets where CVCs invested ventures have 20% employees more than IVCs one. It confirms the hypothesis that startups rely more on corporate resources rather than developing immediately their own. Overall, the VCs funded startups score better than non-VC-backed, underlining the venture capital industry's important role in supporting entrepreneurial activities.

Are Corporate Venture Capitalists Better at Improving the Portfolio Firms' Performances?
An Analysis of CVCs' Heterogeneity

Average Sales				
VC-Backed	IVC	CVC	BVC	GVC
21.032,74 €	15.085,73 €	57.745,20 €	83.715,51 €	6.629,10 €
Not-VC-Backed	-	-	-	-
14.964,81 €	-	-	-	-
Average Assets				
VC-Backed	IVC	CVC	BVC	GVC
80.276,68 €	83.338,32 €	134.135,77 €	151.805,27 €	12.155,81 €
Not-VC-Backed	-	-	-	-
61.260,03 €	-	-	-	-
Average Employees				
VC-Backed	IVC	CVC	BVC	GVC
98,91	100,96	129,72	200,23	28,74
Not-VC-Backed	-	-	-	-
79,24	-	-	-	-

Tab. n.10 – Average Absolute KPIs per VC Type

Concerning the growth measure (Tab. n. 11), they are more similar than the absolute measures. CVC-backed and IVC-backed achieved above the average sales growth compared to the other two categories. On the other side, CVC-backed obtain a below the average input growth rate (i.e., headcounts and assets). It confirms the potential symbiotic relationship between the parties that slow down the startups' internal resources development.

Average Logarithmic Sales Growth				
VC-Backed	IVC	CVC	BVC	GVC
0,33	0,33	0,36	0,27	0,31
Not-VC-Backed	-	-	-	-
0,20	-	-	-	-
Average Logarithmic Assets Growth				
VC-Backed	IVC	CVC	BVC	GVC
0,26	0,26	0,25	0,23	0,26
Not-VC-Backed	-	-	-	-
0,15	-	-	-	-
Average Logarithmic Employees Growth				
VC-Backed	IVC	CVC	BVC	GVC
0,17	0,18	0,15	0,14	0,17
Not-VC-Backed	-	-	-	-
0,07	-	-	-	-

Tab. n.11 – Growth Absolute KPIs per VC Type

Secondly, to deep dive into such considerations, it is necessary to look at the pre and post-investment numbers of the analysed metrics. It is worth noting that the age at the first funding received is almost equal. This outcome signals that the path to get an institutional investor is similar regardless of the VC type. Only BVCs seems to prefer funding older companies as lead investors investor. Pre- and post-investment results highlight the new maturity of the IVCs market. CVCs invest in companies with a better track record in the market than IVCs: 18 Mn euro revenues for the former than 9 Mn euro for the latter. Besides, the average ticket size

(Tab. n.12) validates this assumption. IVCs average ticket size is around 25% higher (2.5 Mn euro) than CVCs (2 Mn euro), notwithstanding the lower pre-investment revenues of CVC-backed. BVCs confirmed as the most risk-averse investors type. They invest late and in new ventures with a solid track record in the market (~ 76 Mn euro). On the other hand, GVC is the category investing in earlier stage startups having a small track record - ~ 7 Mn euro in revenues – validating the role played by government-issued funds in helping unfunded ventures.

Average Age at 1st Investment Received				
VC-Backed	IVC	CVC	BVC	GVC
3,3	3,3	3,4	4,3	3,2
Average Deal Size				
VC-Backed	IVC	CVC	BVC	GVC
2.449,1	2.573,3	1.999,9	2.760,9	1.956,1

Tab. n. 12 – Average Age at 1st Investment and Deal Size per VC type

Pre and Post Investment - Average Sales									
Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
VC-Backed	VC-Backed	IVC	IVC	CVC	CVC	BVC	BVC	GVC	GVC
14.313,8 €	23.525,6 €	9.091,6 €	17.296,6 €	18.099,3 €	72.682,8 €	76.498,7 €	86.730,9 €	5.275,2 €	7.131,1 €
Pre and Post Investment - Average Assets									
Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
VC-Backed	VC-Backed	IVC	IVC	CVC	CVC	BVC	BVC	GVC	GVC
103.192,8 €	71.159,7 €	122.622,1 €	67.780,0 €	32.640,0 €	173.933,3 €	145.161,2 €	154.874,7 €	11.671,1 €	12.346,3 €
Pre and Post Investment - Average Employees									
Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
VC-Backed	VC-Backed	IVC	IVC	CVC	CVC	BVC	BVC	GVC	GVC
82	105,2	85,3	106,7	55,7	155,6	184,9	206,5	21,5	31,6

Tab. n.13 - Average Per and Post-Investment Absolute KPIs per VC Type

By looking at the growth measures, some insights emerge. First, all the startups have similar growth measures for revenues, assets, and employees despite the fund type. It may imply that investors want to see the same traction and internal development in new ventures. Secondly, conversely to what found by Colombo and Murtinu (2017), it seems that CVC-backed ventures experience - on average - a higher sales growth than IVC-backed. The post-investment assets and employees' growth, on the other side, are slower for CVCs compared to IVCs. These results could be the consequence of two elements. First, the absolute value of CVC-backed measures is higher; therefore, the growth rate may start to slow in relative terms. Secondly, as assumed before, the new ventures may receive complementary assets from the corporate and have lower incentives to grow resources internally.

Are Corporate Venture Capitalists Better at Improving the Portfolio Firms' Performances?
An Analysis of CVCs' Heterogeneity

Pre and Post Investment - Average Sales									
Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
VC-Backed	VC-Backed	IVC	IVC	CVC	CVC	BVC	BVC	GVC	GVC
0,6	0,3	0,6	0,3	0,6	0,3	0,5	0,2	0,6	0,2
Pre and Post Investment - Average Assets									
Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
VC-Backed	VC-Backed	IVC	IVC	CVC	CVC	BVC	BVC	GVC	GVC
0,5	0,2	0,5	0,2	0,5	0,2	0,4	0,2	0,5	0,2
Pre and Post Investment - Average Employees									
Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
VC-Backed	VC-Backed	IVC	IVC	CVC	CVC	BVC	BVC	GVC	GVC
0,2	0,1	0,3	0,2	0,3	0,1	0,1	0,1	0,3	0,1

Tab. n.14 - Average Per and Post-Investment Growth KPIs per VC Type

After discussing CVC-backing vis-à-vis other VCs type, it is necessary to deep-dive into the different nuances characterising CVCs' heterogeneity, i.e., CVC mission, autonomy, and the strategic fit between the dyad.

CVC Mission

The second hypothesis mentioned the role played by the CVC's strategic mission in determining the investment activities' success. Therefore, it becomes necessary to investigate the investment activities of strategic CVCs vis-à-vis financial and unfocused ones.

The results of the univariate analysis seem to confirm the results found in the literature review. Strategic CVCs have in their portfolio later-stage companies compared to Financial CVCs: the average sales of a strategic CVC-backed is more than 100% greater than a financial CVC-backed (16 Mn vs 7 Mn euro). Their strategic interest in the startups' know-how manifests when comparing the input measures and, more precisely, the assets values. The new ventures they fund have, on average, an assets book value seven times higher than the financial CVC-backed. The unfocused CVCs seem to blend the approaches of their two counterparts. More precisely, they fund more early-stage ventures than the financial one – the target's average sales are similar - but they have a sweet spot for companies with a great assets value. However, it is worth noting that this measure is still lower than strategic CVC-backed but four times greater than financial CVC ones.

Average Sales		
CVC Strategic	CVC Financial	CVC Both
16.384,2 €	7.065,7 €	6.526,9 €
Average Assets		
CVC Strategic	CVC Financial	CVC Both
71.574,7 €	10.729,7 €	43.968,2 €
Average Employees		
CVC Strategic	CVC Financial	CVC Both
113,3	58,8	19,2

Tab. n.15 – Average Absolute KPIs per CVC Mission

Surprising results emerged from the analysis of the growth measures (Tab. n.16). Despite their primary interest in financial returns, financial CVCs seem not to provide the proper support in sales growth. Their portfolio firms experience the lowest value compared to the other two categories. Unfocused CVCs can offer the right mix of support to their investee firms as they experience the highest growth rate in all the parameters.

Average Logarithmic Sales Growth		
CVC Strategic	CVC Financial	CVC Both
0,18	0,11	0,33
Average Logarithmic Assets Growth		
CVC Strategic	CVC Financial	CVC Both
0,19	0,15	0,25
Average Logarithmic Employees Growth		
CVC Strategic	CVC Financial	CVC Both
0,09	0,14	0,14

Tab. n.16 – Average Growth KPIs per CVC Mission

Concerning deal-specific information (Tab. n.17), all three CVCs' types invest in companies being, on average, four years old. The different ticket size, however, provides some insights. Strategic CVCs invest the highest amount of funds (1 Mn euro) compared to financial CVCs (1k euro) and unfocused ones (172 k euro). It may imply that CVC projects are not only in a later stage – as previously suggested – but they are more assets intensive and require more support. The small amount invested by financial CVCs shed some negative light on the approach adopted by such venture funds, as suggested by Chesbrough (2002). Unfocused CVC average deal size is smaller but aligned with an early-stage ticket. It also signals their lesser interest in heavily invest in the startups for strategic reasons.

Average Age at 1st Investment Received		
CVC Strategic	CVC Financial	CVC Both
4,07	4,43	4,28
Average Deal Size		
CVC Strategic	CVC Financial	CVC Both
1.035,7 €	1,5 €	172,8 €

Tab. n.17 - Average Age at 1st Investment and Deal Size per CVC Mission

The pre and post-investment metrics breakdown in terms of absolute and relative provides greater depth to the analysis (Tab. n.18). Firstly, for what concerns market maturity, CVC strategic prefers to fund more later-stage projects: 3 Mn euro in revenues versus 1,8 Mn and 1,25 Mn euro for financial CVCs and unfocused CVCs, respectively. The assets intensity is what

changes in the targeted new ventures. Strategic-CVC-backed have a far greater assets book value compared to the other.

Pre and Post Investment - Average Sales					
Pre	Post	Pre	Post	Pre	Post
CVC Strategic	CVC Strategic	CVC Financial	CVC Financial	CVC Both	CVC Both
2.954,2 €	19.949,0 €	1.801,3 €	9.321,9 €	1.258,3 €	9.303,6 €
Pre and Post Investment - Average Assets					
Pre	Post	Pre	Post	Pre	Post
CVC Strategic	CVC Strategic	CVC Financial	CVC Financial	CVC Both	CVC Both
17.920,4 €	89.245,3 €	1.521,7 €	14.547,6 €	6.121,9 €	63.453,4 €
Pre and Post Investment - Average Employees					
Pre	Post	Pre	Post	Pre	Post
CVC Strategic	CVC Strategic	CVC Financial	CVC Financial	CVC Both	CVC Both
58,0	127,4	14,5	79,6	9,9	23,8

Tab. n.18 - Average Per and Post-Investment Absolute KPIs per CVC Mission

The pre and post-investment growth measures confirm some of the previous assumptions (Tab. n.19). Financial CVCs act more as an IVC and target new ventures with high pre-investment traction, i.e., more significant sales growth. Strategic CVCs are less concerned about this. On the other hand, unfocused CVCs are similar to their financial counterparts and carefully analyse their targets' revenues progression. Concerning the post-investment patterns on the input size, Strategic CVC-backed experience lower growth rates underlining the dyad symbiotic relationship. Surprisingly, Financial CVC-backed do not score well concerning post-investment sales growth. The ventures backed by their counterparts achieve on average the same post-investment top-line growth.

Pre and Post Investment - Average Logarithmic Sales Growth					
Pre	Post	Pre	Post	Pre	Post
CVC Strategic	CVC Strategic	CVC Financial	CVC Financial	CVC Both	CVC Both
0,26	0,16	0,49	-0,04	0,80	0,16
Pre and Post Investment - Average Logarithmic Assets Growth					
Pre	Post	Pre	Post	Pre	Post
CVC Strategic	CVC Strategic	CVC Financial	CVC Financial	CVC Both	CVC Both
0,53	0,11	0,41	0,08	0,53	0,14
Pre and Post Investment - Average Logarithmic Employees Growth					
Pre	Post	Pre	Post	Pre	Post
CVC Strategic	CVC Strategic	CVC Financial	CVC Financial	CVC Both	CVC Both
0,30	0,05	0,35	0,51	0,12	0,15

Tab. n.19 - Average Per and Post-Investment Growth KPIs per CVC Mission

CVC Autonomy

Another level of heterogeneity considered in Chapter 4 regards the different governance mode a CVC may have. The main organisational settings identified are two, namely exoisomorphic (i.e., governance structure similar to an IVCs) and endoisomorphic (i.e., similar to the corporate).

Concerning the absolute measures (Tab. n.20), CVC exoisomorph have in their portfolio startups in a later stage compared to the endoisomorph ones - 11 Mn vs 7 Mn euro in revenues. This result may surprise, considering that the former adopts practices closer to IVCs rather than traditional CVCs. The two input measures present some differences. More precisely, assets values are similar whilst employees are greater in the exoisomorph-backed. It may signal the same appetite concerning the asset side, but the endoisomorph – due to their structure – tend to provide more support in terms of workforce.

Average Sales	
CVC Exoisomorph	CVC Endoisomorph
11.236,0 €	7.091,3 €
Average Assets	
CVC Exoisomorph	CVC Endoisomorph
45.045,6 €	49.091,1 €
Average Employees	
CVC Exoisomorph	CVC Endoisomorph
85,9	19,4

Tab. n.20 – Average Absolute KPIs per CVC Autonomy

By looking at the growth measure, the inputs' growth is similar to both the autonomy type (Tab. n.21). Conversely, concerning the output measure, i.e., sales, the difference is striking. Exoisomorph CVCs seem far more capable of supporting the top-line growth of portfolio firms, with a growth rate of 0,32 compared to the 0,09 of endoisomorph CVC. It may suggest that the criticisms moved by Gompers (2002) on the adoption of a corporate-like can be valid.

Average Logarithmic Sales Growth	
CVC Exoisomorph	CVC Endoisomorph
0,32	0,09
Average Logarithmic Assets Growth	
CVC Exoisomorph	CVC Endoisomorph
0,23	0,23
Average Logarithmic Employees Growth	
CVC Exoisomorph	CVC Endoisomorph
0,16	0,13

Tab. n.21 – Average Growth KPIs per CVC Autonomy

Concerning deal-specific information (Tab. n.22), CVC exoisomorph invest on average in younger ventures – 3,82 years old – compared to CVC endoisomorph – 5,23 years old. It aligns with the hypothesis that the former tends to adopt investment strategies similar to IVCs. On the other hand, the ticket size is similar.

Average Age at 1st Investment Received	
CVC Exoisomorph	CVC Endoisomorph
3,8	5,2
Average Deal Size	
CVC Exoisomorph	CVC Endoisomorph
1.011,6 €	1.385,4 €

Tab. n.22 - Average Age at 1st Investment and Deal Size per CVC Autonomy

It becomes necessary to understand why the deal size is similar despite the different targets' age by analysing the pre and post-investment data.

Looking at the absolute measures (Tab. n.23), data support the hypothesis that exoisomorphs operate with an IVC-like investment pattern; on the other side, endoisomorphic resemble a classic CVCs fund. More precisely, the former invests in less assets-intensive firms. The latter are more interested in obtaining access to the new venture with a high asset value. On the other hand, the results concerning the pre-investment sales value may surprise. Exoisomorph CVCs invest in startups with a better product-market fit than the endoisomorph (2 Mn vs 500 k euro). One explanation could be that exoisomorph CVCs weigh more the investments' financial risk, whilst endoisomorph CVCs may decide to invest earlier to lock up the startups and exploit their technology.

Pre and Post Investment - Average Sales			
Pre	Post	Pre	Post
CVC Exoisomorph	CVC Exoisomorph	CVC Endoisomorph	CVC Endoisomorph
2.149,1 €	14.634,7 €	568,1 €	9.048,2 €
Pre and Post Investment - Average Assets			
Pre	Post	Pre	Post
CVC Exoisomorph	CVC Exoisomorph	CVC Endoisomorph	CVC Endoisomorph
10.146,3 €	59.384,0 €	7.268,0 €	64.881,5 €
Pre and Post Investment - Average Employees			
Pre	Post	Pre	Post
CVC Exoisomorph	CVC Exoisomorph	CVC Endoisomorph	CVC Endoisomorph
33,68	106,43	5,56	22,83

Tab. n.23 - Average Per and Post-Investment Absolute KPIs per CVC Autonomy

The pre and post-investment growth measures confirm the results found in the absolute ones (Tab. n.24). Exoisomorphs desire to invest in new ventures showing some traction – 0,65 pre-

investment sales growth on average, conversely to endoisomorphs. The pre-investment assets growth confirms the latter interests for the startup know-how when evaluating their targets.

Pre and Post Investment - Average Logarithmic Sales Growth			
Pre	Post	Pre	Post
CVC Exoisomorph	CVC Exoisomorph	CVC Endoisomorph	CVC Endoisomorph
0,65	0,23	-0,03	0,11
Pre and Post Investment - Average Logarithmic Assets Growth			
Pre	Post	Pre	Post
CVC Exoisomorph	CVC Exoisomorph	CVC Endoisomorph	CVC Endoisomorph
0,50	0,15	0,56	0,14
Pre and Post Investment - Average Logarithmic Employees Growth			
Pre	Post	Pre	Post
CVC Exoisomorph	CVC Exoisomorph	CVC Exoisomorph	CVC Exoisomorph
0,37	0,10	0,21	0,11

Tab. n.24 - Average Per and Post-Investment Growth KPIs per CVC Autonomy

Dyad Strategic Fit

The last element to analyse is the impact of strategic fit. Several authors (e.g., Gompers 2002, Ivanov and Xie 2010; Guo et al., 2015) underlined the crucial role strategic fit plays in determining the dyad relationship's success. It is necessary to deep dive into the numbers of in-fit and in-unfit investment relationships.

Starting from the absolute measures (Tab. n.25), startups having a strategic fit with the CVC have less traction - average revenues equal to 10,7 Mn Euro - compared to their peers (14,5 Mn euro). On the other side, they are more assets intensive, with an average assets' value of six times higher than the others. It may signal that CVCs are willing to invest in a more early-stage company when it belongs to the same industrial domain and their strategic objectives are complementary. On the other side, when there is strategic unfit, the investors want to see more traction and are less interested in the assets' side.

Average Sales	
Dyad Fit	Dyad Unfit
10.700,8 €	14.526,2 €
Average Assets	
Dyad Fit	Dyad Unfit
80.645,1 €	13.058,4 €
Average Employees	
Dyad Fit	Dyad Unfit
64,33	94,19

Tab. n.25 - Average Absolute KPIs per Dyad Fit

The growth measure (Tab. n.26) underlines that - on average – a strategic fit can provide a huge boost both in terms of input and output measures. In-strategic-fit startups experience

higher growth measure than their counterpart. On the other side, startups in strategic unfit obtain good results but lower than the former.

Average Logarithmic Sales Growth	
Dyad Fit	Dyad Unfit
0,47	0,34
Average Logarithmic Assets Growth	
Dyad Fit	Dyad Unfit
0,38	0,20
Average Logarithmic Employees Growth	
Dyad Fit	Dyad Unfit
0,22	0,11

Tab. n.26 - Average Growth KPIs per Dyad Fit

Concerning deal-specific information (Tab. n.27), the average age at first investment received confirmed the previous assumption on CVCs investment tendencies. More precisely, corporate funds are willing to invest earlier - one year before - in startups when there is a strategic fit. Besides, the analysis underlined how it increases the deal valuation (e.g., Hellman, 2002). Indeed, even though the in-strategic-fit startups have, on average, lower pre-sales revenues (-50%), the average deal size is not proportionally smaller (-22%). The pre-investment assets value and headcounts can also explain the greater valuation: they are far more significant for startups in strategic fit with their corporate investors.

On the other hand, the input side post-investment results confirmed that corporates are willing to invest in less asset-intensive business models when the startup does not fit with their strategy (Tab. n.28).

Besides, in-unfit startups have to hire their human capital internally: the post-investment headcounts – approximately 144 - are far greater than in the pre-investment that are on average 21.

Conversely, startups in strategic fit receive greater support in developing their technology that grows significantly in the post-investment period from 16 Mn to 109 Mn euro. But can still rely on the corporate's workforce to carry out tasks: the employees' numbers do not increase proportionally to the assets' value.

Average Age at 1st Investment Received	
Dyad Fit	Dyad Unfit
2,98	3,79
Average Deal Size	
Dyad Fit	Dyad Unfit
2.155,5 €	2.607,3 €

Tab. n.27 - Average Age at 1st Investment and Deal Size per Dyad Fit

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Pre and Post Investment - Average Sales			
Pre	Post	Pre	Post
Dyad Fit	Dyad Fit	Dyad Unfit	Dyad Unfit
1.630,9 €	14.568,9 €	2.975,6 €	18.864,5 €
Pre and Post Investment - Average Assets			
Pre	Post	Pre	Post
Dyad Fit	Dyad Fit	Dyad Unfit	Dyad Unfit
16.752,8 €	109.619,4 €	1.373,6 €	17.330,8 €
Pre and Post Investment - Average Employees			
Pre	Post	Pre	Post
Dyad Fit	Dyad Fit	Dyad Unfit	Dyad Unfit
48,43	69,00	21,33	114,06

Tab. n.28 - Average Per and Post-Investment Absolute KPIs per Dyad Fit

The pre and post-investment growth rate demonstrates how – when in strategic fit - corporate investors have all the incentive to support faster sales growth. Indeed, in-fit startups experience a twice as higher growth rate as in the opposite case. Besides, they obtained a higher post-investment growth rate both in assets and employees.

Pre and Post Investment - Average Logarithmic Sales Growth			
Pre	Post	Pre	Post
Dyad Fit	Dyad Fit	Dyad Unfit	Dyad Unfit
0,52	0,46	0,66	0,25
Pre and Post Investment - Average Logarithmic Assets Growth			
Pre	Post	Pre	Post
Dyad Fit	Dyad Fit	Dyad Unfit	Dyad Unfit
0,61	0,32	0,49	0,13
Pre and Post Investment - Average Logarithmic Employees Growth			
Pre	Post	Pre	Post
Dyad Fit	Dyad Fit	Dyad Unfit	Dyad Unfit
0,33	0,20	0,30	0,08

Tab. n.29 - Average Per and Post-Investment Growth KPIs per Dyad Fit

Chapter 7

Research Methodology

The analysis relies on five different statistical models. The first three aimed to measure how the different CVC types influence the portfolio firms' performances; the remaining two investigated the best-suited organisational structure to maximise corporate funds' positive impact.

It was necessary to select the relevant variables properly in order to obtain the final statistical models. They have to capture the correct information for both the investor and the startup sides.

7.1 Startup Variables

The variables capturing startups' financial and non-financial information are both numerical and categorical. Concerning the former, the following ones were considered:

- Ln_sales (Continuous): the logarithmic value of new ventures' sales
- Ln_assets (Continuous): the logarithmic value of new ventures' assets
- Ln_employees (Continuous): the logarithmic value of new ventures' employees
- Ln_age (Discrete): the logarithmic value of the startups' age
- Salesg (Continuous): the logarithmic growth rate of new ventures' sales
- Assetsg (Continuous): the logarithmic growth rate of new ventures' sales
- Employeesg (Continuous): the logarithmic growth rate of new ventures' sales

Following Colombo and Murtinu's (2017) work, sales were used to capture the VCs' impact on the startups' output. On the other side, employees and assets data control for the impact on input measures. Age is a crucial variable to control and usually explain a consistent part of the model. Missing data did not allow to include profitability and valuation measures.

Regarding the categorical variables, the measures used were the following:

- D_sector (binary): seven dummy variables controlling for the startups' sectors
- D_country (binary): twenty-seven dummy variables controlling for the startups' country
- D_year (binary): fifteen dummy variables controlling for the startup's operating year

7.2 Investor Variables

The investors-related variables initially considered were all categorical ones. The first set of variables were necessary to capture the VC types, more specifically:

- CVC_step (binary): a step dummy variable equal to one after the startup received the first round from a CVC.
- IVC_step (binary): a step dummy variable equal to one after the startup received the first round from an IVC.
- BCV_step (binary): a step dummy variable equal to one after the startup received the first round from a GVC.
- BVC_step (binary): a step dummy variable equal to one after the startup received the first round from a BVC.

Secondly, the analysis considers all the variables regarding the CVCs heterogeneity. More precisely, for what concerns the CVCs' missions, the following ones were included:

- CVC_strategic_step (binary): a step dummy variable equal to one after the startup received the first round from a strategic CVC.
- CVC_financial_step (binary): a step dummy variable equal to one after the startup received the first round from a financial CVC.
- CVC_both_step (binary): a step dummy variable equal to one after the startup received the first round from an unfocused CVC.

On the other side, it was necessary to capture the different organisational structure a CVCs may adopt and therefore, two-step variables were added:

- CVC_exo (binary): a step dummy variable equal to one after the startup received the first round from an exoisomorph CVC.
- CVC_endo (binary): a step dummy variable equal to one after the startup received the first round from an endoisomorph CVC.

Lastly, the only element missing is the strategic fit. Therefore, the following variables were considered:

- CVC_fit_step (binary): a step dummy variable equal to one after the startup received the first round from CVC and the dyad is in strategic fit (i.e., the CVC and the startup belong to the same sector).
- CVC_unfit_step (binary): a step dummy variable equal to one after the startup received the first round from CVC and the dyad is in strategic unfit (i.e., the CVC and the startup belong to the different sector).

7.3 Model Definition

The statical model adopted to carry out the analysis is a panel regression model. It composes of a dependent variable and several independent variables explaining the phenomenon.

Concerning the dependent variable, it was necessary to choose a variable capturing the funding's impact on the startups' performances. Considering the unavailability of valuation and profitability measures, sales are the most interesting option. As pointed out by several authors (e.g., Weinzimmer et al. 1998; Barringer et al. 2005), sales are a good proxy to measure success and, therefore, would be meaningful to investigate how different VCs can impact them. The variable adopted was \ln_sales over $salesg$. The decision to opt for the absolute measure was mainly due to improve the interpretability of the results.

Concerning the independent variable, the models include time-invariant information on country and sector. Besides, \ln_age was incorporated as a baseline in all of them. As the models aim at explaining the new ventures' sales, it was essential to control for input measures, i.e., employees and assets. The two have a high correlation between them, and only one could enter the analysis. In the end, assets measure was the final choice as it had fewer missing data compared to employees. As $\ln_assetsw$ presented a high correlation with \ln_sales (Exhibit n.1), the model's dependent variable selected is $assetsg$.

Lastly, step dummy variables control for information on VC types. All the models include IVC_step, BVC_step, GVC_step; on the other side, CVCs-related step variables (CVCs' mission, CVCs' organisation, and CVC strategic fit) changed accordingly to test different research hypotheses.

To sum up, the final variable adopted were:

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Name	Type	Description
Assets_{t-1}	Continuous	Previous-year logarithmic growth rate of new ventures' assets
Ln_Sales	Continuous	Logarithmic value of new ventures' sales
Ln_age	Discrete	Logarithmic value of the startups' age
IVC_step	Binary	Step dummy variable equal to one after the startup received the first fund from an IVC
BVC_step	Binary	Step dummy variable equal to one after the startup received the first fund from a BVC
GVC_step	Binary	Step dummy variable equal to one after the startup received the first fund from a GVC
CVC_step	Binary	Step dummy variable equal to one after the startup received the first fund from a CVC
CVC_strategic_step	Binary	Step dummy variable equal to one after the startup received the first fund from a strategic CVC
CVC_both_step	Binary	Step dummy variable equal to one after the startup received the first fund from an unfocused CVC
CVC_financial_step	Binary	Step dummy variable equal to one after the startup received the first fund from a financial CVC
CVC_exo	Binary	Step dummy variable equal to one after the startup received the first fund from an exoisomorph CVC
CVC_endo	Binary	Step dummy variable equal to one after the startup received the first fund from an endoisomorph CVC
CVC_fit_step	Binary	Step dummy variable equal to one after the startup received the first fund from CVC and the dyad is in strategic fit
CVC_unfit_step	Binary	Step dummy variable equal to one after the startup Received the first fund from CVC and the dyad is in strategic unfit
d_country	Binary	Twenty-seven dummy variables controlling for the startups' country
d_sector	Binary	Seven dummy variables for the prominent startups' sectors
d_year	Binary	Fifteen dummy variables controlling for the startup's operating year

Tab. n.30 – Regression Models' Variables

Since continuous numerical variables' presented some outliers, they were winsorised at the 5% level. Overall, after the procedure, they are better distributed like a normal (except for the tails) (Fig. n.25).

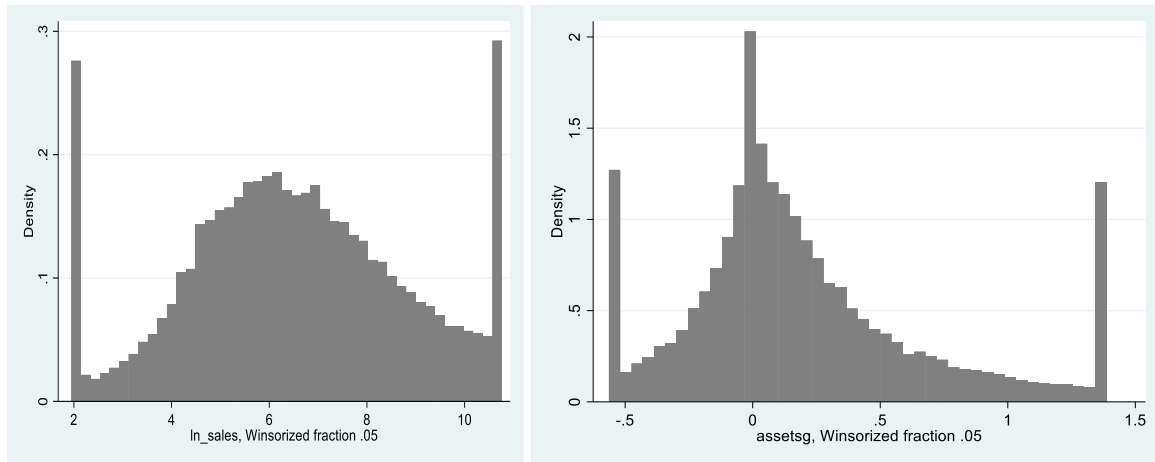


Fig. n.25 – Variables' Distribution

Finally, Fig. n.26 shows the correlation matrix.

	ln_sal~w	ln_age	assetsgw	IVCstep	CVCstep	BVCstep	GVCstep	CVC_st~p	C~1_step	CVC_bo~p	CVC_exo	CVC_endo
ln_salesw	1.0000											
ln_age	0.3516	1.0000										
assetsgw	-0.0517	-0.2958	1.0000									
IVCstep	0.1244	0.1310	0.0133	1.0000								
CVCstep	0.0014	0.0215	0.0005	0.0532	1.0000							
BVCstep	0.0877	0.0724	-0.0209	0.0408	0.0068	1.0000						
GVCstep	-0.0383	0.0315	0.0027	0.0792	0.0381	0.0277	1.0000					
CVC_strate~p	-0.0003	0.0360	-0.0113	-0.0316	0.3603	-0.0106	-0.0222	1.0000				
CVC_financ~p	0.0155	0.0156	-0.0000	-0.0259	0.1732	-0.0074	-0.0107	-0.0024	1.0000			
CVC_both_s~p	0.0078	0.0133	-0.0054	-0.0326	0.2489	-0.0107	0.0026	-0.0034	-0.0016	1.0000		
CVC_exo	0.0240	0.0330	-0.0068	-0.0403	0.4472	-0.0153	-0.0247	0.5586	0.2531	0.4376	1.0000	
CVC_endo	-0.0108	0.0306	-0.0035	-0.0208	0.2507	-0.0108	-0.0155	0.4349	0.0416	0.1333	-0.0043	1.0000
CVC_fit_step	-0.0083	-0.0152	0.0133	0.0291	0.3331	-0.0038	-0.0013	0.0505	0.0794	0.0309	0.0706	0.1661
CVC_unfit~p	0.0097	0.0325	-0.0064	-0.0197	0.4187	-0.0096	0.0201	0.3647	-0.0028	0.1864	0.4899	0.0500

Tab n.31 – Variables' Correlation Matrix

The statistical models developed to analyse the data were three different regressions models:

- i) Ordinary Least Square
- ii) Random Effect panel regression to control for unobserved heterogeneity
- iii) Fixed Effect panel regression to control for all the time-invariant differences between the entities

The baseline model that drove the whole analysis of the CVCs impact on the startups' sales is the following one:

$$(0) Ln_Sales_{it} = \beta_0 + \beta_1 Ln_Ages_{it} + \beta_2 Assetsgw_{i(t-1)} + \beta_3 CVC_Step_{it} + \beta_4 IVC_Step_{it} + \beta_5 BVC_Step_{it} + \beta_6 GVC_Step_{it} + \beta_7 Control + \varepsilon_{it}$$

This model represents the basis for the five following regressions built to investigate how different CVCs impact the startups and the best organisational setting to maximise such impact.

Model (1) approaches the CVCs' organisational structure and its influences on the startups' sales. It tests H1, saying that exoisomorph CVCs score better than endoisomorph ones:

$$(1) \text{Ln_Sales}_{w_{it}} = \beta_0 + \beta_1 \text{Ln_Ages}_{it} + \beta_2 \text{Assets}_{gw_{i(t-1)}} + \beta_3 \text{CVC_exo}_{it} + \beta_4 \text{CVC_endo}_{it} \\ + \beta_5 \text{IVC_Step}_{it} + \beta_6 \text{BVC_Step}_{it} + \beta_7 \text{GVC_Step}_{it} + \beta_8 \text{Control} + \varepsilon_{it}$$

Model (2) analyses the effect of the CVCs strategic choice. It tests H2, i.e., whether the corporate's strategic intent is differentiating for the portfolio firms' performances (e.g., Chesbrough, 2002):

$$(2) \text{Ln_Sales}_{w_{it}} = \beta_0 + \beta_1 \text{Ln_Ages}_{it} + \beta_2 \text{Assets}_{gw_{i(t-1)}} + \beta_3 \text{CVC_Strategic_fit}_{it} \\ + \beta_4 \text{CVC_financial_fit}_{it} + \beta_5 \text{CVC_both_fit}_{it} + \beta_6 \text{IVC_Step}_{it} + \beta_7 \text{BVC_Step}_{it} \\ + \beta_8 \text{GVC_Step}_{it} + \beta_9 \text{Control} + \varepsilon_{it}$$

Model (3) hinges on what the literature suggests concerning the CVCs' strategic goal to test H2a and H2b. More precisely, several authors (e.g., Chesbrough, 2002) support that corporate venture funds have to be strategic to properly function; on the other hand, they tend to support the adoption of an IVC-like structure (e.g., Gompers, 2002). However, the latter is not straightforward to achieve (e.g., Hendry, 2002; Dokko and Gaba, 2012). Therefore, it becomes interesting to evaluate the interaction of the strategic step variable with the organisational step variables and see which is the best one:

$$(3) \text{Ln_Sales}_{w_{it}} = \beta_0 + \beta_1 \text{Ln_Ages}_{it} + \beta_2 \text{Assets}_{gw_{i(t-1)}} + \beta_3 \text{CVC_Strategic}_{it} \times \text{CVC_exo} \\ + \beta_4 \text{CVC_Strategic}_{it} \times \text{CVC_endo} + \beta_5 \text{IVC_Step}_{it} + \beta_6 \text{BVC_Step}_{it} + \beta_7 \text{GVC_Step}_{it} \\ + \beta_8 \text{Control} + \varepsilon_{it}$$

Model (4), taking inspiration from Ivanov and Xie (2010) and Gompers (2002), analysed the role played by the strategic fit between the dyad. More precisely, it tests H3, saying that a complementary strategy can enhance the portfolio firms' performances:

$$(4) \text{Ln_Sales}_{w_{it}} = \beta_0 + \beta_1 \text{Ln_Ages}_{it} + \beta_2 \text{Assets}_{gw_{i(t-1)}} + \beta_3 \text{CVC_Fit_Step}_{it} \\ + \beta_4 \text{CVC_Unfit_Step}_{it} + \beta_5 \text{IVC_Step}_{it} + \beta_6 \text{BVC_Step}_{it} + \beta_7 \text{GVC_Step}_{it} \\ + \beta_8 \text{Control} + \varepsilon_{it}$$

Model (5) tests H3a and H3b. It hinges on the literature suggesting how strategic fit is fundamental for a flourishing investment relationship (e.g., Ivanov and Xie, 2010) to understand the best organisational structure to sustain such an investment. It was possible to analyse the two's interplay by interacting the organisational step variables with the strategic fit step variable:

$$(5) \ln_Salesw_{it} = \beta_0 + \beta_1 \ln_Ages_{it} + \beta_2 Assetsgw_{i(t-1)} + \beta_3 CVC_Fit_Step_{it} \times CVC_exo \\ + \beta_4 CVC_Fit_Step_{it} \times CVC_endo + \beta_5 IVC_Step_{it} + \beta_6 BVC_Step_{it} \\ + \beta_7 GVC_Step_{it} + \beta_8 Control + \varepsilon_{it}$$

7.4 Field Interviews

Three interviews were carried out to complement the econometric analysis. The first interviewee is a CVC manager working for 2020-born Corporate Venture Capital funds of a big Italian utility company. The second one is a partner of pan-European Independent Venture Capital investing in the high-tech sector. The third one is an Italian-based Independent Venture Capital partner focused on early-stage investing in the digital sector. The interviews covered topics concerning:

- i) Deal Flow
- ii) Strategy Definition
- iii) Organisational setting

For further information, Exhibit n.2 includes the interview transcriptions.

Chapter 8

Results

The following chapter divides into two parts. In the first one, the t-tests and ANOVA test results are presented to check for significant differences in the different CVCs type identified. Secondly, the results of the five models are discussed.

7.1 Heterogeneity Check

At first, the analysis investigates whether the different categories of CVCs funded statistically different startups. In other words, the different cluster of startups identified via the different CVCs type, i.e., the independent variables, should have meaningful different sales value, i.e., the dependent variable.

For what concerns the CVCs' goals, an ANOVA test has been carried out (Tab. n.32). The results showed a statistically significant difference for at least one group.

CVC_goal	Summary of ln_sales, Winsorized fraction .05			Freq.
	Mean	Std. Dev.		
0	7.4811624	2.1724614		50
1	6.5609083	2.2213527		205
2	6.6977517	1.6568328		113
Total	6.7279627	2.0745764		368

Source	Analysis of Variance			F	Prob > F
	SS	df	MS		
Between groups	34.1895899	2	17.0947949	4.04	0.0184
Within groups	1545.32972	365	4.23378007		
Total	1579.51931	367	4.30386734		

Bartlett's test for equal variances: chi2(2) = 11.9021 Prob>chi2 = 0.003

Tab. n.32 – Anova Test CVCs' Goals

A subsequent Turkey test deep-dived into within-group variances (Tab. n.33). Strategic CVC – categorised with 1 – and financial CVC – categorised with 0 – fund startups with statistically significant sales differences over the observed period. It confirms what found in the literature and the univariate analysis chapter. The unfocused CVCs – categorised with 2 – are statistically different from financial CVCs whilst being similar to strategic CVCs.

ln_salesw	Contrast	Std. Err.	Tukey		Tukey	
			t	P> t	[95% Conf. Interval]	
CVC_goal						
1 vs 0	-.920254	.324543	-2.84	0.013	-1.684006	-.1565022
2 vs 0	-.7834107	.3494892	-2.24	0.066	-1.605869	.0390472
2 vs 1	.1368433	.2410802	0.57	0.837	-.4304942	.7041809

Tab. n. 33 – Turkey Test CVCs' Goals

Secondly, the analysis focuses on the differences between startups backed by exoisomorph and endoisomorph CVCs. A t-test was carried out (Tab. n.34). The results confirmed the two groups differ from each other, with a neat difference between the pair. The endoisomorph one – valued with 1 – shows a lower level of sales over the observed period than companies funded by the exoisomorph one – categorised with 0.

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	349	7.004436	.1016871	1.899673	6.804437	7.204434
1	91	6.090066	.2079527	1.983743	5.676932	6.503201
combined	440	6.815327	.0929923	1.950624	6.632562	6.998093
diff		.9143696	.2256687		.4708416	1.357898

diff = mean(0) - mean(1) t = 4.0518
 Ho: diff = 0 degrees of freedom = 438

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr(T < t) = 1.0000 Pr(|T| > |t|) = 0.0001 Pr(T > t) = 0.0000

Tab. n. 34 – T-Test CVCs' Isomorphism

The last t-test concerns the difference between the startups in strategic fit with their CVCs and the other ones (Tab. n.35). The results showed that in-fit startups – categorised with 0 – have a statistically higher level of sales over the investment period in comparison to their peers – categorised with 1.

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Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	293	6.710543	.1296883	2.219906	6.4553	6.965785
1	194	5.947031	.1691641	2.356183	5.613384	6.280679
combined	487	6.406392	.1043755	2.303366	6.201309	6.611475
diff		.7635113	.2105877		.3497344	1.177288

diff = mean(0) - mean(1) t = 3.6256
Ho: diff = 0 degrees of freedom = 485

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.9998 Pr(|T| > |t|) = 0.0003 Pr(T > t) = 0.0002

Tab. n.35 – T-Test Dyad Fit

7.2 Regression Results

We develop five different regressions models. The first investigated the impact of the different CVCs type according to their mission, organisational structure, and strategic fit. All of them are computed by using three estimation methods: Ordinary Least Square, Random Effect, and Fixed Effect.

Model (1) tested H1, saying that CVCs adopting an IVC-like organisational structure, i.e., exoisomorphic, have a greater impact on portfolio firms performance. This analysis was necessary to understand, ex-ante, the best performing CVCs model before deep-diving into the hypotheses. The results provide interesting insights (Tab. n.36) on the topic. More precisely, exoisomorph seems to play a crucial role in portfolio firms' development. Indeed, in RE, CVC_exo is positive ($\beta=0.38$) and significant ($p>0.01$) and have a higher impact than IVC_step ($\beta=0.24$). In FE is positive ($\beta=0.29$) and slightly significant ($p>0.10$), challenging its ability to impact more than IVC_step that is lower ($\beta=0.29$) but highly significant ($p>0.01$). OLS does not provide any significant results signalling that the unobserved variables influencing an organisational model's effectiveness are several. On the other hand, CVC_endo is negative but not significant in any models questioning the endoisomorph approach. Indeed, The results confirm H1 and suggest that exoisomorphism is more suited to manage corporate venture funds (e.g., Gompers, 2002). It directly contrasts with the literature doubting the CVCs ability

to adopt an IVCs-like organisational structure (e.g., Dushnitsky and Shapira, 2010; Dokko and Gaba, 2012).

Variables	OLS	RE	FE
assetsgw _{t-1}	0.411*** (0.028)	0.208*** (0.013)	0.195*** (0.014)
ln_age	1.399*** (0.029)	1.208*** (0.039)	1.223*** (0.058)
IVCstep	0.388*** (0.028)	0.246*** (0.027)	0.225*** (0.030)
CVC_endo	-0.282 (0.242)	-0.250 (0.313)	-0.215 (0.370)
CVC_exo	0.184 (0.139)	0.380*** (0.145)	0.296* (0.162)
GVCstep	-0.225*** (0.044)	0.089** (0.045)	0.210*** (0.051)
BVCstep	0.623*** (0.058)	0.233*** (0.059)	0.164** (0.066)
dummy industries	yes	yes	-
dummy years	yes	yes	yes
Log-Likelihood	-4.70e+04		-2.40e+04
R2	0.24	0.23	0.13
N	22832	22832	22832

Tab n.36 – Model's (1) Results

The Model (2) tested H2, saying that the CVCs' strategic intent enhances their impact on portfolio firms. The results are surprising. In all the three models, i.e., OLS, RE, FE, only financial CVCs seem to provide consistent support to portfolio firms (Tab. n.37). Surprisingly, their coefficient is always positive and statistically significant. Besides, in all three econometric models, financial CVCs outperform the IVCs' impact on startups by far. On the other hand, the results coming from CVC_both_step are positive in all three instances but not significant at conventional levels. Lastly, strategic CVCs seem not to improve startups sales. The coefficients in the models are negative and not significant. To conclude, the analysis leads to rejecting H1. These results contrast what stated in the literature (e.g., Chesbrough, 2002). Several authors stressed the role of strategic CVCs in providing peculiar value-adding services such as access to manufacturing capabilities, access to distribution channels, and technological due diligence (e.g., Maula et al., 2003b; Dushnitsky and Lenox, 2005a). One of the venture capital interviewed confirmed this element (Exhibit n.2): CVCs are critical industrial partners, especially in high-tech industries, and their competencies can help over the deal process.

Therefore, such results could be the consequence of three main effects. Firstly, strategic CVCs' may have a lower focus on startups' sales growth. They are a more patient form of capital and do not direct their attention towards top-line development instead of improving the technology underneath. Secondly, strategic CVCs may need a peculiar organisation structure to unleash their potential. A clear strategic goal may generate tensions with the entrepreneurs, and only with the right processes safeguarding the relationship benefits can be reaped. Thirdly, financial CVCs, on the other side, seeks mainly financial returns and are interested in pushing startups' sales. The higher impact compared to IVCs may signal that this type of CVCs can combine the benefit of corporate and venture capital investment.

Variables	OLS	RE	FE
assetsgw _{t-1}	0.412*** (0.028)	0.208*** (0.013)	0.195*** (0.014)
ln_age	1.399*** (0.029)	1.207*** (0.039)	1.223*** (0.058)
IVCstep	0.387*** (0.028)	0.246*** (0.027)	0.226*** (0.030)
CVC_strategic_step	-0.232 (0.172)	-0.097 (0.205)	-0.226 (0.232)
CVC_financial_step	0.720** (0.367)	0.854*** (0.329)	0.884** (0.355)
CVC_both_step	0.053 (0.240)	0.233 (0.240)	0.212 (0.266)
GVCstep	-0.227*** (0.044)	0.088* (0.045)	0.209*** (0.051)
BVCstep	0.624*** (0.058)	0.235*** (0.059)	0.166** (0.066)
dummy industries	yes	yes	
dummy years	yes	yes	yes
Log-Likelihood	-4.70e+04		-2.40e+04
R2	0.24	0.23	0.13
N	22832	22832	22832

Tab. n.37 – Model's (2) Results

Model (3) tested H2a, suggesting that an endoisomorph structure is more suited to support a CVC with strategic goals, and H2b, suggesting the opposite, i.e., an exoisomorph model is more suited to support a CVC with a strategic goal. The results lead to interesting results.

First of all, strategic CVCs per-sè confirmed their negative impact on portfolio firms; in all the models, CVC_strategic is negative and only in OLS ($p > 0.001$) and RE ($p > 0.10$) significant. It

becomes interesting analysing its interaction with the different organisational model, i.e., CVC_exo and CVC_endo.

The interplay between CVC_strategic_step and CVC_exo, in all the different econometric models, suggests a positive impact on portfolio firms' from strategic and IVC-like CVCs (Tab. n.40). However, only the OLS provide significant results. More precisely, the adoption of an exoisomorph structure, which has a positive ($\beta=0.29$) and not significant impact, leads to obtain a positive ($\beta=1.18$) and significant ($p\text{-value} > 0.001$) interaction variable. It is worth noting that, despite the interesting results, the exoisomorph structure seems not fully able to offset the negative effect of strategic CVC that score a greater ($\beta=-1.44$) and significant ($p\text{-value} > 0.01$) coefficient. Therefore, it becomes necessary to test the two coefficients sums and evaluate the final impact. The test result In (Tab n.38) confirms the assumption with satisfactory confidence. In FE and OLS, the exoisomorph structure is more suited to mitigate the potential issues that a strategic mission may generate but do not improve the sales performances.

To sum up, not controlling for unobserved variables, CVCs can unleash their capabilities via an IVCs-like structure. Exoisomorphism could be the right setting for providing the differentiating value-adding services of corporate ventures without negatively impacting the startups' financial performances. Indeed, it allows combining the corporate world's specific benefits such as complementary services and technical due diligence. On the other hand, it can solve risks concerning organisational deficiencies (e.g., hierarchical structure, compensation scheme) and misappropriation. Besides, the previous results obtained in Model (1), i.e., the positive impact of CVC_exo per-sè, results support even more this assumption. Thus, we can only partially accept H2b.

A possible explanation can come from Hill and Birkinshaw (2008) and Fischer et al. (2019) studies. They suggested that it is necessary to achieve coherence between organisational practices and strategic goals to have better results. On the organisational side, exoisomorphism seems to be standard, while CVC strategic goals' adoption generates some issues. Therefore, it means that CVCs are finding their way to combine these practices with their mission. For this reason, as for now, strategic CVCs may struggle to impact startups' performances positively.

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Variables	OLS	RE	FE
L.assetsgw	0.411*** (0.028)	0.208*** (0.013)	0.195*** (0.014)
ln_age	1.400*** (0.029)	1.207*** (0.039)	1.220*** (0.058)
IVCstep	0.387*** (0.028)	0.246*** (0.027)	0.226*** (0.030)
CVC_strategic_step	-1.446*** (0.504)	-1.229* (0.631)	-1.170 (0.752)
CVC_exo	0.298 (0.184)	0.578*** (0.189)	0.569*** (0.211)
<i>CVC_strategic_stepXCVC_exo</i>	1.184** (0.575)	0.746 (0.696)	0.505 (0.821)
CVC_endo	0.653 (0.406)	0.269 (0.411)	0.245 (0.474)
GVCstep	-0.227*** (0.044)	0.088* (0.045)	0.209*** (0.051)
BVCstep	0.624*** (0.058)	0.234*** (0.059)	0.165** (0.066)
dummy industries	yes	yes	-
dummy years	yes	yes	yes
Log-Likelihood	-4.70e+04		-2.40e+04
R2	.24	0.22	.12
N	22832	22832	22832
<i>CVC_strategic_step+CVC_strategic_stepXCVC_exo</i>	-0.342	-0.483*	-0.665***

Tab. n.38 – Model's (3) Results

Model (4) tested H3, saying that CVCs have a greater impact on startups when they are in a strategic fit. The results confirm what stated in the literature (Tab. n.39). More precisely, several scholars (e.g. Gompers and Lerner, 2000; Gompers, 2002; Ivanov and Xie, 2010) stressed that CVCs' investments could significantly increase the portfolio firms' performances when the dyad has complementary strategies. More precisely, the impact of CVC's funding on sales is positive and significant in the RE ($\beta=0.41$; $p>0.05$) and FE ($\beta=0.65$; $p>0.001$) models. In both cases, CVC_fit_step outperform IVCs' impact consistently. In OLS, the results are not significant, underlining the importance of unobserved variables in this context. Concerning the CVC-startup unfit case, the results in FE confirmed that it does not bring any benefits: the CVCs' impact on startups is negative ($\beta=-0.35$) and significant ($p>0.05$). Both RE and OLS do not provide significant results.

To conclude, Model's (4) results validate H3, suggesting the presence of complementary objectives mitigates misbehaviour from both sides (Katila et al., 2008). The corporate has all

the incentives to support the backed new ventures whilst the entrepreneur is open to disclosures and not free-ride.

On the other hand, a strategic unfit may lead to incentives misalignment preventing a smooth relationship between them. The corporate may misappropriate – if the strategic objectives are competing – or it may lose its interest - if the startups' development trajectory turns out to be out of scope.

Variables	OLS	RE	FE
assetsgw _{t-1}	0.412*** (0.028)	0.207*** (0.013)	0.194*** (0.014)
ln_age	1.399*** (0.029)	1.208*** (0.039)	1.219*** (0.058)
IVCstep	0.386*** (0.027)	0.242*** (0.027)	0.221*** (0.030)
CVC_fit_step	-0.053 (0.194)	0.410** (0.205)	0.695*** (0.259)
CVC_unfit_step	-0.030 (0.147)	-0.223 (0.152)	-0.359** (0.167)
GVCstep	-0.226*** (0.044)	0.090** (0.045)	0.215*** (0.051)
BVCstep	0.623*** (0.058)	0.235*** (0.059)	0.167** (0.066)
dummy industries	yes	yes	-
dummy years	yes	yes	yes
Log-Likelihood	-4.70e+04		-2.40e+04
R2	0.24	0.23	0.13
N	22832	22832	22832

Tab n.39 – Model's (4) Results

Model (5) investigated H3a, suggesting that CVCs should adopt an endoisomorph structure when investing in startups with a strategic fit, and H3b, suggesting that CVCs should adopt an exoisomorph structure when investing in startups with a strategic fit.

We obtained mixed results (Tab. n.40). CVC strategic fit confirms the pattern showed in Model (3). More precisely, it becomes positive and significant only after controlling for unobserved variables in FE ($\beta=0.745$; $p\text{-value}>0.01$). In the other two econometric models (OLS and RE), it remains non-significant. These outcomes influence the interpretation of the interaction between CVC_fit_step with the organisation structure, i.e., CVC_exo and CVC_endo.

The only model that provides significant results is again OLS, where the two interaction terms are significant. More precisely, both the interplays with CVC_exo ($\beta=1.50$) and CVC_endo ($\beta=1.52$) are positive and significant. At a first look, the results may question Gompers and Lerner (2000), who suggest that CVCs should operate in strategic fit unencumbered by the corporate-like structure, i.e. exoisomorph structure. However, it is worth noting that the variable CVC_endo ($\beta=-0.52$) has a negative and slightly significant impact on the startup's performances whilst CVC_exo ($\beta=0.12$) is positive, although not significant. Therefore, before rejecting Gompers and Lerner's (2000) argument, we tested the combined effect of the organisational variable CVC_endo and CVC_exo on the strategic fit. The results (Tab. n.40) confirmed ($p\text{-value}>0.05$) the argument that, overall, CVCs in strategic fit with the startups can enhance startups' performances slightly better by adopting an IVC-like organisational structure ($\beta=1.179$) rather than a corporate-like one ($\beta=1.164$).

However, OLS seems to be not reliable for several reasons. Firstly, previously in Model (1) and (4), the role of unobserved variables was stressed: it becomes challenging to support the thesis with OLS. Secondly, the variable CVC_fit_Step is negative and not significant. Lastly, the empirical and theoretical evidence on strategic fit's positive role is ample, and the CVC_fit_step negative coefficient is likely to be a consequence of estimation issues.

On the other side, RE and FE models do not lead to any significant results. More precisely, in all the cases, the pattern of CVC_fit_step, CVC_exo, and CVC_endo reflect what estimated previously in Model (1) and Model (4). However, their interactions are not significant. It is reasonable to assume that controlling for unobserved variables, the interplay between the organisational structure and the strategic fit does not seem to be associated with portfolio firms' performances.

The interviews carried out with one prominent CVC may shed some light on such results. More precisely, the CVC manager underlined that his main scope was to create complementarities with their portfolio firms. Strategic fit is a mandate, and the majority of investments activities should be made in this direction. He explained that in this way, they can benefit in terms of innovation and, on the other side, provide the proper support to the investment firms technology-wise. Thus, it is also possible that the exomorphic organisation's benefits transfer first on the firm's innovation activity and, more in the long term, on the firm's output. However, the role of organisational structure seems to come in second place. It is reasonable

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to assume that the organisational structure's choice does not influence the investment strategy, and both H3a and H3b are rejected.

Variables	OLS	RE	FE
L.assetsgw	0.411*** (0.028)	0.208*** (0.013)	0.195*** (0.014)
ln_age	1.400*** (0.029)	1.209*** (0.039)	1.220*** (0.058)
IVCstep	0.388*** (0.028)	0.244*** (0.027)	0.221*** (0.030)
1.CVC_fit_step	-0.333 (0.220)	0.355 (0.226)	0.745*** (0.279)
1.CVC_exo	0.128 (0.142)	0.331** (0.149)	0.273* (0.165)
1.CVC_fit_stepX1.CVC_exo	1.509** (0.686)	0.572 (0.684)	0.003 (0.957)
1.CVC_endo	-0.524* (0.271)	-0.270 (0.344)	-0.176 (0.392)
1.CVC_fit_stepX1.CVC_endo	1.494** (0.633)	-0.238 (0.854)	-1.073 (1.203)
GVCstep	-0.226*** (0.044)	0.088* (0.045)	0.209*** (0.051)
BVCstep	0.623*** (0.058)	0.234*** (0.059)	0.167** (0.066)
dummy industries	yes	yes	-
dummy years	yes	yes	yes
Log-Likelihood	-4.70e+04		-2.40e+04
R2	.24	0.23	.13
N	22832	22832	22832
CVC_fit_step+CVC_fit_stepXCVC_exo	1.179**	0,927	0,775
CVC_fit_step+CVC_fit_stepXCVC_exo	1.164**	0,117	-0,328

Tab. n.40 - Model's (5) Results

Chapter 9

Conclusions

The thesis investigates the CVCs heterogeneity impact on portfolio firms' performances as the empirics on their positive impact on startups are often contrasting. On one side, the industry widely recognises CVCs value-adding role. They are considered incredible industrial partners that can challenge and support the technical side of the idea. On the other side, the CVC captive nature and their close relationship with the parent generate some problems. CVCs have strategic objectives, i.e., prioritise the parent's goals that might be not completely aligned with the portfolio firms' ones. The consequences are several, such as misappropriation risks, that can create an agency problem, increasing the dyad's information asymmetry. However, it emerged that not all the CVCs are the same. It is necessary to account for their differences to understand their impact on portfolio firms. More precisely, the theory stressed the existence of different strategic intents, i.e., financial, strategic, or unfocused, and organisational models, i.e., organic or mechanic. Therefore, it is worth testing whether an ideal CVC profile exists where the two variables mentioned above fit. An alignment in terms of strategy and structure should guarantee a smooth run of the activities and lead to a better impact on the startup performances.

The thesis started by analysing Colombo and Murtinu's (2017) study investigating the CVCs' and IVCs' different impact on portfolio firms in terms of channels and timing. The analysis approaches the same topic but from a different angle by leveraging the work of Souitaris et al. (2012) and Hill and Birkinshaw (2008). In particular, it analysed whether a particular fund's characteristics concerning the organisational structure or strategic orientation may unleash CVCs' strengths and limit their drawbacks. The study analysed pan-European startups funded by worldwide professional investors between 1998 to 2016. The dataset was built starting

from VICO and Orbis, integrated with desk research to provide an overarching view of the economic and entrepreneurial phenomenon observed. Lastly, to gain a better insight into the data and results, two prominent Italian IVCs and one CVC were interviewed.

The thesis started considering theoretical evidence on the entrepreneurs' pros and cons in entering into an equity tie relationship with a CVCs.

The literature reached a consensus on the differentiating value-adding activities of corporate ventures vis-à-vis other competitors. Maula et al. (2005) stressed how CVCs are more suited to provide company nurturing services. In other words, startups can leverage the parent's technical know-how and infrastructure to grow their business. They can receive complementary assets (e.g., Block and MacMillan, 1993), access to distribution channels (Chesbrough, 2000), but also technical support from BUs and partners (Ivanov and Xie, 2017). Besides, the parent's company is usually an established player in the industry and receiving funds from them act as a stamp of approval, i.e., provide legitimacy to overcome the liability of alienness (e.g., McNally, 1997).

On the other side, several cons emerged over time. CVCs are not structured to support young and risky ventures like IVCs. More precisely, they usually cannot implement outcome-based compensation schemes to hire top investment managers, decreasing their services' quality on startups (Gompers and Lerner, 2000). Secondly, they do not organise with a Limited Partnership model urging to put maximum efforts in screening and monitoring portfolio companies (Gompers and Lerner, 1996). Besides, the CVC captive nature may misalign the dyad objectives. Being strategic investors, they prioritise the corporate's goals instead of portfolio firms' (e.g., Zu Knyphausen-Aufseß, 2010). Indeed, the entrepreneurs' misappropriation risks are high, as the CVCs can misbehave and seize secret information on technology and the market. Katila et al. (2008) defined this disclosure trade-off as the "swimming with shark" dilemma. The theoretical studies suggest that the decision to start an equity tie with a CVCs depends on contingencies (e.g., IP rights, market uncertainty, level of complementarities). Indeed, Hellmann (2002), in his Model, suggests that the entrepreneurs should receive funding only when the dyad's technologies are complementary. Park and Steensma (2012) suggest that the entrepreneurs' crucial variables to assess are assets complementarity and market uncertainty.

After the theoretical deep-dive, a closer look at the empirics to understand the role CVCs played on the portfolio firms' economic performances was necessary. The evidence collected so far are mixed or incomplete. Chemmanur and Loutskina (2008) provide strong support for better economic performances of CVC-backed vis-à-vis IVC-backed. Unfortunately, the study suffers from survivorship bias as the panel data included post-IPO startups. Bertoni et al. (2013) focused on economic parameters' growth and found that CVC-backed sales' growth rate is lower than IVC-backed ones due to corporate funds lower incentive to grandstanding. Colombo and Murtinu (2017) carried out the most overarching study. The authors analysed the impact in terms of Overall Factor Productive and found that CVCs impact is significant for what concerns sales growth but lower than IVCs ones both in the long and short term. Simultaneously, it is limited for what concerns assets and employees, underlining the dyad symbiotic and the corporate willingness to provide complementary assets.

All the studies mentioned above do not include one element in their analysis: heterogeneity. Therefore, starting from Souitaris et al. (2012), the first level of heterogeneity was defined. Leveraging on the organisational theory, the authors classify CVCs as exoisomorph or endoisomorph. The former refers to CVCs opting for an IVC-like organisational model, i.e., an organic structure (Mintzberg, 1979). The latter regards CVC adopting a corporate-like organisational model, i.e., mechanic structure (Mintzberg, 1979). Hill and Birkinshaw (2008) stressed how CVC, to work appropriately, should obtain consistency between their strategic objectives and the organisational profile adopted. The two are mutually influencing forces implying that for a given strategy exists a limited number of suitable structures and vice versa (Drazin and Van de Ven, 1985). Only the CVCs that can obtain a fit will survive in the market (Di Maggio and Powell, 1983).

Subsequently, it becomes crucial to add another level of heterogeneity to consider: strategic orientation. Several authors classify CVC leveraging on this element (e.g., Chesbrough, 2002; Rohm et al., 2017). What emerged from the literature is that CVCs objectives are usually strategic, even though it is not unusual to find financially focused or unfocused CVCs (Rohm et al., 2017). Besides, scholars agree on the idea that CVC's strategic goals underpin the primary value-adding benefits that it can provide vis-à-vis other VCs (e.g., Chesbrough, 2002; Gompers, 2002). The incentives to provide access to complementary assets, technological due diligence, and access to the broad network are connected to their intrinsic motivation to extract value for their parent companies. The more frequent the interaction, the more the

startups develop the technology, and the more they can tap into new knowledge (e.g., Sykes, 1990; McNally, 1997; Kann, 2000; Ernst and Young, 2002; Keil, 2002).

Starting from these elements, the analysis focused on understanding whether one heterogeneity level score better than the other or not; but most importantly, it investigated the existence of an ideal organisational structure to support strategic CVCs. The issue involves a series of trade-off to solve. First of all, the same benefits that make strategic CVCs attractive for startups lead to some drawbacks. As previously mentioned, the close-knit relationship may exacerbate the disclosure issue and misalign the parties' incentives (Katila et al., 2008). Most importantly, the corporate's institutional pressure (Di Maggio and Powell, 1983) and CVC managers with previous corporate experience (Dokko and Gaba, 2012) can drive the CVC unit to adopt a corporate-like organisation structure (Souitaris et al., 2012). However, this structure is often criticised in the venture investment world due to lack of payment schemes affecting talent attraction (Gompers and Lerner, 2000; Dushnitsky and Shapira, 2010) and pressure from Limited Partners, but also the presence of inter-organisation conflicts (Sykes, 1990).

On the other side, the adoption of an IVC-like organisational structure is not straightforward. The corporate has to adopt some practices challenging to replicate within the corporate boundaries, such as adopting high-powered incentives schemes (Lawler and Drexel 1980; Block and Ornati 1987; Dushnitsky and Shapira, 2010). They, on one side, can generate tensions in terms of payment equality (Corporate Venturing Directory & Yearbook, 2001) and, on the other, may steer away managers from strategic investing (Hendry, 2002).

The trade-off is evident, and an analysis is needed to tackle this issue.

At first, it is crucial to understand which is the most suited organisational structure for CVCs. Hypothesis 1 relies on what suggested by the literature concerning the benefits of the exoisomorph organisational model and aims to test its superior capabilities compared to the endoisomorph one.

Secondly, it becomes necessary to understand whether strategic CVCs have a strategic impact on the portfolio firms vis-à-vis their peers (H2).

The last step involves letting the two variables interact in order to investigate the most coherent organisational structure to support strategic CVCs, i.e., endoisomorph (H2a) or exoisomorph (H2b).

Subsequently, the third hypothesis approached the strategic intent from a different angle. Evidence suggests that CVCs should invest in startups with a strategic fit, i.e., startups operating in a similar industry whose objectives complement. It aligns the dyad's incentives and enhances the corporate impact on portfolio firms' performances (Gompers and Lerner, 2000; Gompers, 2002; Hellmann, 2002; Ivanov and Xie, 2010). It is reasonable to argue the decision on the funds' allocation, i.e., the investment strategy, is a proxy directly reflecting the corporate strategic intent. Therefore, H3 tested whether the strategic fit confirmed what suggested by the literature and align with H2 findings.

On the other hand, evidence suggests that the typology of startups in the portfolio significantly affects the organisational structure's effectiveness (Fischer et al., 2019). It becomes interesting to investigate whether an endoisomorph (H3a) or an exoisomorph (H3b) structure is more suited to support the investment in strategic-in-fit startups.

Five econometrics models were built to test the hypotheses, and Tab. n.41 summarised and explains the results.

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MODEL	HYPOTHESIS	COMMENTS
MODEL 1	H1 – Exoisomorph CVC's will have a higher impact on portfolio firms than endoisomorph CVCs	Accepted. Exoisomorph confirmed its superior and significant impact. Endoisomorph is negative and not significant
MODEL 2	H2 –Strategic CVCs will have a higher impact on portfolio firms' than their peers	Rejected. Strategic CVCs have a negative and not significant impact on startups performances. Conversely, Financial CVCs have a positive and significant impact
MODEL 3	H2a - Strategic CVC will have a higher impact on portfolio firms' performances adopting an endoisomorph structure H2b - Strategic CVC will have a higher impact on portfolio firms' performances adopting an exoisomorph structure	Rejected Partially accepted. The exoisomorph structure proved to enhance the CVC strategic impact in certain settings
MODEL 4	H3 – CVC will have a higher impact on portfolio firms' performances in case of strategic fit	Accepted. Strategic Fit confirmed its positive and significant impact. Strategic unfit is negative and significant
MODEL 5	H3a - CVC will have a higher impact on portfolio firms' performances adopting an endoisomorph structure in case of strategic fit H3b - CVC will have a higher impact on portfolio firms' performances adopting an exoisomorph structure in case of strategic fit	Rejected. The interaction between the two variables was not significant Rejected. The interaction between the two variables was not significant

Tab. n.41 – Models' Results

Model (1) provides an interesting insight concerning the organisational structure of the corporate venture funds. More precisely, it proved H1, suggesting that CVCs adopting an IVC-like structure, i.e., exoisomorph, will have a greater impact on portfolio firms performances.

The greater autonomy guarantees the top management to adopt practices typical of the VC world, such as a high-powered incentives scheme, without any internal tensions. The payment scheme is considered one of the critical variables for attracting top employees and has proved to improve the fund's performances (Gompers, 2002; Dushnitsky and Shapira, 2010). An endoisomorph structure would impede the adoption of such practices and expose the drawbacks of a mechanic structure in such a fast-changing environment (Gompers and Lerner, 2000; Gompers, 2002). The results align with what the literature suggested and, for the first time, provide a first quantitative study proving the significance of the organisational structure in managing corporate venture funds.

Secondly, Model (2) is instrumental in the understanding role played by CVCs' mission. Surprisingly, the results reject H2, saying that the CVCs' strategic intent should have a greater impact on startups' performances. A robust strategic goal may exacerbate the swimming with shark issue (Katila et al., 2008). The dyad relationship is based on a fragile cooperation equilibrium that is highly fragile (Santos and Eisenhardt, 2011; Brandenburger and Nalebuff, 2011). More precisely, if the corporate's competitive side prevails, it can leverage its preferred position to tap into new knowledge and misappropriate them (Dushnitsky and Shaver, 2009). The entrepreneurs can adopt some safeguard to protect their know-how, starting a vicious cycle.

On the other side, it emerges how financial CVCs fare better than any other venture funds. It is reasonable to assume that the deliberate financial missions can help the corporate funds reassure the entrepreneurs concerning the misappropriations and align their incentives. Secondly, the financial aim urges them to obtain adequate returns on investment to survive. Therefore, the CVCs provide all the necessary support to the startups' sales, considered one of the critical variables that future investors consider in their investment analysis (e.g., Weinzimmer et al., 1998).

Model (3) rejects H2a, saying that adopting an endoisomorph organisational structure improves the strategic CVC impact on portfolio firms' performances. The result aligns with the literature: a corporate-like structure is not suited to cope with the venture capital environment (e.g., Gompers, 2002). The mechanic structure may slow the deal flow and generate tensions in payment equality and resource allocation.

On the other hand, Model (3) provides mild support to H2b, saying that adopting an exoisomorph organisational structure improves the impact of strategic CVCs. More precisely, it emerges how adopting an IVC-like model mitigates the strategic CVC negative contribution to the portfolio firms' performances. In other words, the strategic intent does not prove to be a differentiating factor for portfolio firms, even after controlling for the organisation structure, and the latter currently play a slightly significant mitigating role in the former negative impact. Therefore, leveraging Hill and Birkinshaw (2008) and Fischer et al. (2019), the limited impact can be the direct consequence of a current misalignment between the fund's goal and organisational model. It seems that strategic CVCs still have to find a way to combine their mission with the right organisational setting allowing them to unleash their potential. What is certain is that the exoisomorph structure is going to be the norm. Model (1) provides significant results, and the interviews (Exhibit n.2) confirm this element. More precisely, the interviewed CVC manager's fund is entirely outsourced to an IVCs, which is in charge of the whole deal flow. The parent defines the strategy, carries out the technical due diligence, and has an informal approval on the deal. The encouraging element is that he deliberately stated that the funds' objective is strategic. The mandate for the IVCs is to find promising new ventures in related segments. It is reasonable to assume that the new CVCs' wave is now finding a method to align the organisational model with the strategic intent. Unfortunately, the data considered an antecedent period, and the analysis may reflect struggles now overcome.

Model (4) confirmed H3, saying that CVCs will have a higher impact on portfolio firms' performances when investing in startups with a strategic fit. The results are aligned with the studies of Gompers and Lerner (2000), Gompers (2002), and Ivanov and Xie (2010). In other words, the strategic fit is a vital catalyst in aligning the parties' objectives and can positively improve the equity tie relationship. On one side, the corporate has all the incentives to support the portfolio firms; on the other, the entrepreneurs are less concerned about the misappropriation risk, and it is more willing to provide the required set of information to get out the most from the relationship. In the case of strategic unfit, two different scenarios can occur. On one side, the parents do not have all the competencies to support the firms as it operates in a distant domain. On the other, it could be that the two strategies are conflicting, exacerbating the tension in the relationship (Hellmann, 2002).

Model (5), on the other hand, do not provide any significant results. It rejects both H3a, stating that the endoisomorph CVCs have a higher impact on portfolio firms' performance when strategic fit, and H3b, saying that exoisomorph CVCs have a higher impact on portfolio firms' performance when strategic fit. The results seem to signal a complete unrelatedness between the two variables. Leveraging on the interviews is possible to provide a satisfactory explanation. More precisely, on one side, the interviewed IVCs manager stressed the CVCs' role as an industrial partner, underlining how they are crucial when investing in new ventures with related technologies. On the other, the CVC manager deliberately stated that the fund invested in new ventures in related businesses. Therefore, practitioners widely recognised that the positive impact that a CVCs' investment has in strategic fit startups is the norm. Indeed, the Model's (4) results proved this assumption. However, the CVC manager underlined that they carefully evaluate investment opportunities in other adjacent business, evaluating case by case the market opportunity. It is reasonable to assume that investment strategy moves in a completely different path from the organisational structure and is not affected by such decisions. In other words, the choice of whether to invest in a peculiar startup is bounded by other elements but not directly by the organisational settings.

9.1 Limitations and future research directions

The final aim of the study was to capture the impact of heterogeneity in the CVC domain. More precisely, whether existed a peculiar organisational structured supporting strategic-oriented CVCs. The study has several limitations and leaves many open areas to tackle in future research.

The first limitation concerns the dataset analysed. The study focuses on Europe on a limited number of CVC transactions (the ones for which information on strategy and organisational structure of the CVC were available). Future studies could replicate the analysis in different institutional settings on a larger amount of data.

Concerning the measures adopted in the study, the analysis relies on the proxy adopted for the CVCs' strategic intent and strategic fit. More precisely, for the former, information was

gathered from websites, considered a potential source of information by Porter (1997). However, they may not fully capture the strategic orientation of the observed CVCs. Future studies can gather information from different sources, such as the CVCs top management team's prior working experiences (Dokko and Gaba, 2012), to compare the results.

On the other hand, the strategic fit measure matched the dyad sectors. This proxy may not capture the level of complementary completely. The previous studies addressing the issues rely on annual report information (Gompers and Lerner, 2000; Ivanov and Xie, 2010). However, they operate with a small dataset, and the process is not straightforward to replicate in a vast database as VICO. Alternatively, future studies can also control another variable that is considered crucial in an interfirm equity tie with CVCs: assets complementarity. Park and Steensma (2012) stressed the importance of assets complementarity in the tie formation and defined them as one of the main differentiating elements determining the tie formation (e.g., Chesbrough, 2002). Therefore, it is reasonable to assume that a specific organisational structure can support the prevision of such activity better. Controlling for this information in the analysis would help to add another information layer on CVCs' heterogeneity.

Lastly, as a dependent variable, the study relies on sales measures. Despite widely recognised as a measure of success (e.g., Weinzimmer et al., 1998), this dimension captures only a part of the economic impact that an investment may have. Further research can deepen the analysis by adopting a more overarching perspective on the CVC funding impact. As Colombo and Murtinu (2017) did, an analysis in terms of Overall Economic Performances would help to understand how the investment of heterogenous CVCs influence both the output (sales) and input (assets and employees) channels. On the other hand, as Ivanov and Xie (2010) did, it would be interesting to analyse the startups' valuation to understand different CVCs' role in the long-term value generation.

To conclude, in the entrepreneurial finance context, the unobservable variables are crucial to control in the analysis. The five models relied on three different regression techniques: Ordinary Least Square, Random Effect, Fixed Effect. The last two allowed control for time-invariant unobserved variables influencing the regressors (RE) and the dependent variable (FE). A more advanced technique, such as the General Method of Moment, would control time-variant information influencing the analysis.

Exhibits

```
. corr ln_assetsw ln_salesw
(obs=33,736)
```

	ln_ass~w	ln_sal~w
ln_assetsw	1.0000	
ln_salesw	0.7610	1.0000

Exhibit n.1 - ln_assetsw ln_salesw Correlation Matrix

Exhibit n.2 - Field Interviews

Sebastiano Silvestri - CVC Manager at A+360 (CVCs fund of A2A)

- **Macro Tema 1:** Scelta del modello organizzativo e pratica dei VC/Corporate VC:
 - o Come sono organizzate le attività (team vs individui)?
 - o Livelli gerarchici?
 - o Chi ha responsabilità sull'allocazione dei fondi (accentrato vs decentrato)?
 - o Quanta autonomia hanno i singoli investment manager nelle varie attività?
 - o (Per CVC) Quali sono i rapporti con la casa-madre pre- (sulle decisioni di investimento) e post- (in particolare con la startup) investimento?

Risposte Silvestri:

Il nostro è un fondo sui generis: Dedicated fund. Il VC è un mondo lontano per a2a, però abbiamo voluto approcciarci a questo senza dover delegare il capitale a terzi. Quindi abbiamo creato un fondo dedicato con un partner. a2a è unico LP (Limited Partner, ndr), questo fondo dedicato si chiama a+360 ed è gestito da 360 Capital, io (Silvestri, ndr) in quota a2a risuldo come persona che supervisiona su scouting. In altre parole: io lavoro in 360 Capital ma sono dipendente di a2a. Quindi la politica di investimento è solo di a2a, ma attività di investment e, quindi l'investment committee, è di 360 Capital, che ha ha updated ricorrenti con persona di innovazione di a2a. Quindi fondo fa investimenti in linea con le politiche di a2a ma ha libertà.

In a2a, io faccio parte della funzione innovazione e riporto all'head of innovation. Il quale riporta al responsabile strategy e development, che sta sotto al CEO.

Io seguo tutte le attività di CVC in sinergia con la funzione innovazione. Ma di fatto non c'è una struttura organizzativa perché è data in outsourcing con terzi.

Su alcune opportunità più puntuali, a2a fa passaggi interni di valutazioni. Ma il fondo è indipendente. Quindi gli investimenti sono comunque focalizzati su energia e utility, ma sono in carico ad a360 Capital. a2a interviene al massimo per svolgere la due diligence tecnologica. Il principale motivo dell'aver scelto un dedicated fund è legato al loro rapporto con la startup. In particolare se fosse stato "a2a ventures" avremmo problemi nella gestione di limiti di crescita. Se a2a ventures fosse in cap table sarebbe difficile che altri investors entrino. Ora in cap table c'è il fondo a360, quindi a2a ha una relazione privilegiata rispetto ad essere un semplice LP, anche perché abbiamo bisogno di creare sinergie. Però almeno nella relazione con startup ci va il nostro partner a360 Capital. Io sono dentro come observer, ma non c'è un direttore di a2a dentro. Quindi le startups hanno con a2a un rapporto principalmente cliente fornitore tramite partnership. In aggiunta a2a supporta le sperimentazioni. In altre parole, a2a diventa una sorta di startup client ma con maggior riguardo visto che sono soci. Infatti, Green Parrot, ci ha scelto nonostante abbiamo un grosso fondo dietro perché il nostro fondo combinava la parte finanziaria con (a360 Capital) e quella strategica industriale (a2a)

- **Macro Tema 2:** Processo di investimento, in particolare:
 - Riassumeresti in breve il vostro deal flow?
 - Criteri di selezione (e.g. dati finanziari e di mercato, prodotto e team)?
 - Il criterio più importante? Quale deal killer?
 - Quanto pesa la componente tecnologica?
 - Cercate complementarità tra voi e la startup?
 - Se sì, di che tipo quali (tecnologia, industria, mercato)?
 - Attività di monitoring? Come gestite le milestone? Che servizi offrite alle startup?
 - Co-investimenti (con altri tipi di VC o altri investitori es. Business Angels): con che criteri scegliete co-investitori? Chi sono quelli con cui investite più di recente?

Risposta Silvestri:

Arriva il dossier o da a360 o dal loro sito o dal network dei due partner o di settore (e.g. Plug and Play). Inizia poi il processo ad imbuto. O a360 o a2a vedono se è interessante e poi si fa una prima call prima di iniziare la due diligence. Se le due diligence è ok, si passa il tutto all'investment committee di Capital a360, che comunque fa in passaggio informale prima con a2a. Se il dossier passa anche questa fase, c'è una due diligence più strutturata (legale e brevetto) e poi si fa investment.

Noi guardiamo a tech disruptive che hanno le potenzialità di trasformare il settore. Come a2a non abbiamo l'obiettivo di fare un ritorno finanziario, però al nostro interno abbiamo portfolio companies che scontano una valutazione solo finanziaria. Quindi startups che hanno una go-to-market facile. Ma ci interessano disruptive technologies con anche una go-to-market più difficile. Quindi può essere che un dossier che un qualsiasi VC avrebbe scartato, noi potremmo dare la nostra approvazione ad investire. Dobbiamo coniugare l'investimento

startup (exponential) con sinergia industriale con l'obiettivo di abilitare nuovi servizi e trovare nuove tecnologie.

Data la politica di investimento del fondo, ci focalizziamo sul seed, con qualche cosa in series A. Quindi guardiamo il team, che deve con forte competenze tecniche e capacità imprenditoriali, che è difficile da trovare. Seconda cosa, guardiamo la tecnologia, soprattutto se la startup fa hardware: fanno una estensiva due diligence. La terza, è la classica dimensione di mercato: è grande abbastanza se hanno un 1Bn di Total Addressable Market. Facciamo de-risking su tutte e tre e speriamo tutte a posto. Altrimenti si fanno valutazioni puntuali. In Series A guardano con più attenzione le metriche economiche.

Noi non vogliamo solo investire, come CVC abbiamo l'obiettivo di portare a casa innovazione e lavorarci; vogliamo sostenere ecosistema di startup lato competenze industriali. Quindi noi forniamo fondi, diventiamo i primi clienti e poi le presentiamo a diverse società. Poi decidiamo se acquistarle o meno. Non essendoci a2a in cap table, possiamo scegliere se vendere e fare cap gain o fare M&A se sinergie forte e ci troviamo bene. Generalmente ai founders viene chiesto pre-emption da a2a. Solo con una startup ci abbiamo solo investito ma non lavorato per limitazioni tecniche.

In cap table entra a+360, io come a2a partecipo come observer, ma senza potere di voto. Quindi faccio una gestione di portfolio a nome di a2a sopportando il più possibile le startups. Ad esempio, posso metterli il contatto con clienti o farli seguire nello sviluppo. Con Grey Parrot, li sto facendo interagire con la BU in termini di sviluppo prodotto per poi aprire nuovi partner commerciali. Di fatto, seguiamo la loro crescita insieme al 360 Capital e gli diamo l'upside che ha a2a come player industriale.

Il co-investimento è sempre in essere come opzione. 360 Capital opera come lead investor quindi prendono tutto come investimento, al netto di deal troppo alti. Co-investment c'è ma varia base opportunità

- **Macro Tema 3:** Obiettivi del fondo (soprattutto per corporate VC), in particolare:
 - o Chi definisce la strategia del fondo?
 - o Quali sono i vostri obiettivi?
 - o Come vengono declinati nei vari livelli dell'organigramma?
 - o Se e come variano gli obiettivi deal to deal e in base ai co-investitori? Pensate che la definizione di obiettivi specifici (legati ad un investimento) abbia un effetto positivo sulle performance dell'investimento?

Risposta Silvestri:

Iniziativa nuova, non ci sono obiettivi prefissati. Quindi non abbiamo obiettivi specifici a livello di numeri. Non dobbiamo investire entro 5 anni per poi liquidare il fondo e fare capital gain. Non c'è un obiettivo ben definito valutiamo in base alle opportunità.

La strategia è definita secondo un vero e proprio regolamento, che prevede geografia, ticket, industry che Capital 360 deve seguire. La strategia, verte quindi forte sul piano industriale di a2a

- **Macro Tema 4:** Covid-19 e outlook
 - o Qual è stato l'impatto del covid sulle vostre attività organizzative, sul funding, sui processi d'investimento?
 - o Quali le maggiori challenge in questo periodo?

- Come sono cambiati i vostri obiettivi strategici/finanziari?
- Qual è l'outlook per il vostro fondo post-covid più nel lungo termine?

Risposta Silvestri:

I fondi di CVC seppur, nelle loro modalità, in base alla volontà della corporate può chiudere in tempo zero, c'è una exit option. Hanno molto più flessibilità

Il nuovo CdA (Consiglio di Amministrazione, ndr) di a2a ha dato più importanza nella fase seed invece che late stage, ma questa scelta non è stata modificata con il Covid non c'è stata modifica.

Il problema maggiore della pandemia è andare a vedere fisicamente sia founder che prodotto.

Stefano Guidotti - Partner at P101

- **Macro Tema 1:** Scelta del modello organizzativo e pratica dei VC/Corporate VC:
 - Come sono organizzate le attività (team vs individui)?
 - Livelli gerarchici?
 - Chi ha responsabilità sull'allocazione dei fondi (accentrato vs decentrato)?
 - Quanta autonomia hanno i singoli investment manager nelle varie attività?

Risposta Guidotti:

Responsabilità allocazione ce l'ha la prima linea gerarchica: i partner. Formalmente decide il CdA (Consiglio di Amministrazione, ndr) dove i partner hanno presenza, quindi la decisione è collegiale. C'è organo intermedio che è il comitato di investimento che ha compito di indirizzo per il CdA. Il più delle volte c'è sovrapposizione tra CdA e comitato investimenti (CI), oppure le persone chiave del CdA sono anche nel CI. Questo è importante per il concetto di key manship: persone che hanno vincoli sulla vita del fondo. LP (Limited Partner, ndr) investono in persone che gestiscono il fondo.

Come vengono prese le decisioni in CI: Varia da realtà a realtà. In alcuni fondi ci vuole unanimità, altre volte funziona a punteggi/persona: bisogna raggiungere un numero di punti per far partire allocazione.

Le realtà italiane che sono piccole hanno due livelli gerarchici: partner e team. Nella vita del fondo per prendere decisioni consapevoli c'è molto confronto, quindi struttura snella. Come livelli gerarchici poi ci sono partner, poi investment team (Investment manager + analyst). Team orizzontali e molto lean.

La tendenza è coinvolgerci tutti in base a quello che si fa. C'è una parte di studio che è personale, poi si lavora sul deal in team. Il nostro è un lavoro dove la condivisione è fondamentale.

- **Macro Tema 2:** Processo di investimento, in particolare:
 - Riassumeresti in breve il vostro deal flow?
 - Criteri di selezione (e.g. dati finanziari e di mercato, prodotto e team)?
 - Il criterio più importante? Quale deal killer?
 - Quanto pesa la componente tecnologica?

- Cercate complementarità tra voi e la startup?
- Se sì, di che tipo quali (tecnologia, industria, mercato)?
- Attività di monitoring? Come gestite le milestone? Che servizi offrite alle startup?
- Co-investimenti (con altri tipi di VC o altri investitori es. Business Angels): con che criteri scegliete co-investitori? Chi sono quelli con cui investite più di recente?

Risposta Guidotti:

Il Deal Flow è un imbuto a maglie crescenti. Si parte da parametri macro (settore, stato di sviluppo) poi da lì si parte con il lavoro fatto a step con obiettivo di validare i parametri che garantiscono successo. Si parte dalle macrocategorie, poi si fa partire uno scambio di informazioni con la società per capire soprattutto tutti gli aspetti prospettici. In totale vengono fatti quattro/cinque passaggi.

Il primo livello di analisi si fa su mercato, Business Model, Financials e con una prima interazione con il team. Poi da parte una fase di analisi a granularità maggiore dove vai a spaccettare modello economico e finanziario; in questa fase ci si inizia a relazionare con il team e si inizia a capire come ragionano.

Le assumption alla base da testare durante il confronto sono sia operative che strategiche.

Se l'idea piace c'è un primo partners meeting per avere approvazione per andare avanti. Se si va avanti si va avanti con term sheet. Dopo la definizione del term sheet si fa ulteriore passaggio tra partners. Se anche qui c'è approvazione si va in due diligence e si scrivono contratti - il 95% del deal si fa in questa fase. Ultimi passaggi riguardano la due diligence e la formalizzazione degli investimenti in CdA.

I Parametri chiave sono le Persone, soprattutto in early stage, perché si è sicuri che funzioni in futuro e Mercato, che deve essere grande il giusto. Sono molto correlati perché le persone smart è difficile che vadano in un mercato piccolo. Poi si valuta la sostenibilità finanziaria del deal, ad esempio, se investo in una cosa che ha bisogno di 50M e io so che non riuscirò a fornirli, vuol dire che devo affidarmi a terzi per andare avanti. Però io non so chi siamo questi terzi e questo può creare problemi a livello di governance. Poi si guarda la sustainability (in termini di ESGs) e governance. La composizione della cap table è chiave, più è ampia più il processo decisionale è lento. Le persone rimangono comunque il Deal killer. La tech per noi è un level playing field, ma è per un motivo di difendibilità dell'investimento quindi garantisce di avere un vantaggio competitivo. In più c'è oggettivizzazione della valutazione perché assets tech ha un face value, mentre il processo o brand hanno valori poco oggettivi.

Noi non facciamo monitoring, la nostra attività chiave è la gestione portafoglio. Si fa monitoring quando il capitale è infinito e la qualità degli assets è molto alta. Noi quindi facciamo gestione portfolio: siamo coinvolti a livello operativo di governance, abbiamo un posto nel CdA. Poi richiediamo dei checkpoint per garantire un accompagnamento continuo, ad esempio può capitare che ogni 2 gg due giorni ci si sente. I passaggi formali sono dei report mensili strutturati con metriche. Con alcune facciamo sprint di sviluppo. Infine tramite la posizione in CdA vediamo l'andamento delle revenues, Contribution Margin, EBITDA, ma anche gender equality.

I co-investitori sono dei compagni di viaggio chiave; tendialmente si va con qualcuno che ha esperienze e track record. È fondamentale. Ci sono situazioni in cui investi per ultimo in base a chi ha già investito. In altri casi facciamo noi da capo fila e poi influenziamo la scelta dei co-investitori, scegliendo quelli che hanno track record specifici. Li coinvolgiamo direttamente, perché vogliamo che investono. La stessa cosa per un partner industriale: CVC sono chiave per un check sulla fattibilità tecnica del business.

- **Macro Tema 3:** Obiettivi del fondo (soprattutto per corporate VC), in particolare:

- Chi definisce la strategia del fondo?
- Quali sono i vostri obiettivi?
- Come vengono declinati nei vari livelli dell'organigramma?
- Se e come variano gli obiettivi deal to deal e in base ai co-investitori? Pensate che la definizione di obiettivi specifici (legati ad un investimento) abbia un effetto positivo sulle performance dell'investimento?

Risposta Guidotti:

L'obiettivo è ritornare i soldi moltiplicati agli investors anticipando un trend tech che vediamo, guidati da aspetti di sostenibilità. Ora è chiave investire in startup che hanno in mente la sostenibilità.

Per quanto riguarda gli obiettivi di fundraising stanno definendo la dimensione delle masse in gestione.

Key metrics, vogliamo fare almeno 3x su fondi in gestione

Struttura molta snella e orizzontale. Quindi tutta organizzazione allineata con obiettivi. Meeting bisettimanale sul fund model e come sta evolvendo. Si aggiornando in particolare sulle prospettive future in base agli obiettivi identificati e se ci sono variazioni.

Gli obiettivi non cambiano, rimangono a prescindere dai co-investitori e situazione di mercato. Cambia approccio di scouting ma obiettivo rimane fisso.

Di fatto i partner dopo un processo di qualche mese con back and forth, costruiscono la strategia. Poi c'è comunque margine per modificarla

- **Macro Tema 4:** Covid-19 e outlook

- Qual è stato l'impatto del covid sulle vostre attività organizzative, sul funding, sui processi d'investimento?
- Quali le maggiori challenge in questo periodo?
- Come sono cambiati i vostri obiettivi strategici/finanziari?
- Qual è l'outlook per il vostro fondo post-covid più nel lungo termine?

Risposta Guidotti

Il fundraising non è cambiato perché l'avevamo già finito a inizio 2020. A inizio 2020 abbiamo fatto un po' di triage con i fondi e abbiamo fermato gli investimenti. Poi abbiamo spostato tutto il team a supportare le startup in portfolio. Con supporto si intende utilizzare i contatti con studi legali per capire cosa poteva stare aperto in base ai codici ateco. In aggiunta, abbiamo aiutato in termini di pensieri creativi su come limitare i danni e/o sfruttare il momento.

La sfida principale è incertezza: non sai il comportamento di mercato e c'era il dubbio su quanto tempo sarebbe durata. Era difficile capire fino a quanto le startups avrebbero avuto le risorse necessarie sia a livello operativo e psicologico. Perché un altro supporto chiave del VC è anche psicologico al team.

Tuttavia anche con il covid gli obiettivi non sono cambiati: c'è l'idea e la convinzione che il covid sia stato un evento passeggero con impatti di lungo termine. Diventerà un elemento dell'ecosistema in cui le startups impareranno a muoversi. C'è da usarlo a proprio vantaggio Outlook post covid positivo. Le realtà in portfolio hanno beneficiato perché la modifica del mercato è stato verso il digitale e le nostre realtà in portfolio sono tutte digitali. Vediamo tanto upside.

Lorenzo Tencati - Partner at LTH

- **Macro Tema 1:** Scelta del modello organizzativo e pratica dei VC/Corporate VC:
 - o Come sono organizzate le attività (team vs individui)?
 - o Livelli gerarchici? Gerarchia tipicamente dipende dal fondo e quanto sono grandi.
 - o Chi ha responsabilità sull'allocazione dei fondi (accentrato vs decentrato)?
 - o Quanta autonomia hanno i singoli investment manager nelle varie attività?

Riposta Tencati:

La gerarchia è composta da investment manager, poi direttori e infine il chief investment officer. L' investment manager fa sia analisi e origination del deal. Directors di solito si occupano di fare sponsorship del deal. All'interno dell'investment committee c'è poi una discussione collegiale.

L'investment manager ha molta autonomia nelle decisioni. Solitamente però si tende a prendere le decisioni all'interno dell'investment committee, che è sempre funzionante a meno che il chief investment officer è così forte che di fatto ha tutto il potere decisionale

- **Macro Tema 1:** Processo di investimento, in particolare:
 - o Riassumeresti in breve il vostro deal flow?
 - o Criteri di selezione (e.g. dati finanziari e di mercato, prodotto e team)?
 - o Il criterio più importante? Quale deal killer?
 - o Quanto pesa la componente tecnologica?
 - o Cercate complementarità tra voi e la startup?
 - o Se sì, di che tipo quali (tecnologia, industria, mercato)?
 - o Attività di monitoring? Come gestite le milestone? Che servizi offrite alle startup?
 - o Co-investimenti (con altri tipi di VC o altri investitori es. Business Angels): con che criteri scegliete co-investitori? Chi sono quelli con cui investite più di recente?

Risposte Tencati:

Il Deal flow è il seguente. Si parte con origination, dove si raccolgono diversi pitch e poi screening, dove l'investment manager controlla fattori di investimento. Nella fase di screening si controlla se c'è un fitting su team e investment criteria del fondo. Se ok, c'è uno screening più approfondito da parte dei senior, poi si prosegue con pre-due diligence con disclosure dati, poi agreement term sheet e poi due diligence svolta da service providers. Se tutte queste fasi vanno a buon fine c'è l'investimento.

Per un VC i team sono la key metric importantee, più è la startup early stage più il team è chiave. A seguire ci sono la scalabilità del business, una via chiara di exit, un comprovato product-market fit e traction, che rappresentano un assessment di unicità del prodotto, e value appropriation, un gross margin appropriato perché avere un product market fit non è necessario.

Il Deal Killer è un comprovato product-market fit poiché include di fatto scalability e team. La componente tech deve dare la scalability e la value appropriation. Quindi funzionale solo alla creazione di valore e per creare vantaggio competitivo. Pesa tanto in maniera indiretta. I driver principali sono quelli menzionati prima.

Le attività di monitoring includono board meeting, quarterly e yearly updates. Mentre ci sono anche informal chat ogni mese. I maggiori aiuti che forniamo sono input strategici nei board meeting e accesso al network del portfolio. In base alla bravura del VC, queste attività possono variare.

Cerchiamo tanti co-investitori per diversificare il rischio e inoltre facciamo in modo che i network si mettano insieme per fare crescere la tecnologia alla base della startup. In aggiunta c'è un supporto a livello di due diligence da parte dei co-investitori

- **Macro Tema 3:** Obiettivi del fondo (soprattutto per corporate VC), in particolare:
 - o Chi definisce la strategia del fondo?.
 - o Quali sono i vostri obiettivi?
 - o Come vengono declinati nei vari livelli dell'organigramma?
 - o Se e come variano gli obiettivi deal to deal e in base ai co-investitori? Pensate che la definizione di obiettivi specifici (legati ad un investimento) abbia un effetto positivo sulle performance dell'investimento?

Risposte Tencati:

Noi, come GP definiamo una strategia e puntiamo a trovare LP a cui piace.

Come LTH abbiamo l'obiettivo di investire in tecnologie che hanno la possibilità di portare un impatto sostenibile e ritorni finanziari double digit. Quindi ci orientiamo su specifiche aree geografiche e poi cerchiamo match molto profondo con founder.

La nostra organizzazione è molto snella con obiettivi che possono cambiare. Si lavora molto in sprint.

- Covid-19 e outlook
 - o Qual è stato l'impatto del covid sulle vostre attività organizzative, sul funding, sui processi d'investimento?
 - o Quali le maggiori challenge in questo periodo?
 - o Come sono cambiati i vostri obiettivi strategici/finanziari?
 - o Qual è l'outlook per il vostro fondo post-covid più nel lungo termine? Positivo

Risposta Tencati:

Aumentato challenge del work-from home, però meno di altri business. Investimenti sono andati meglio perché sono cresciuti. Diventa più difficile fare fundrasing.

Abbiamo dovuto ritardare gli obiettivi strategici, soprattutto, e poi quelli finanziari in base a capital availability.

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