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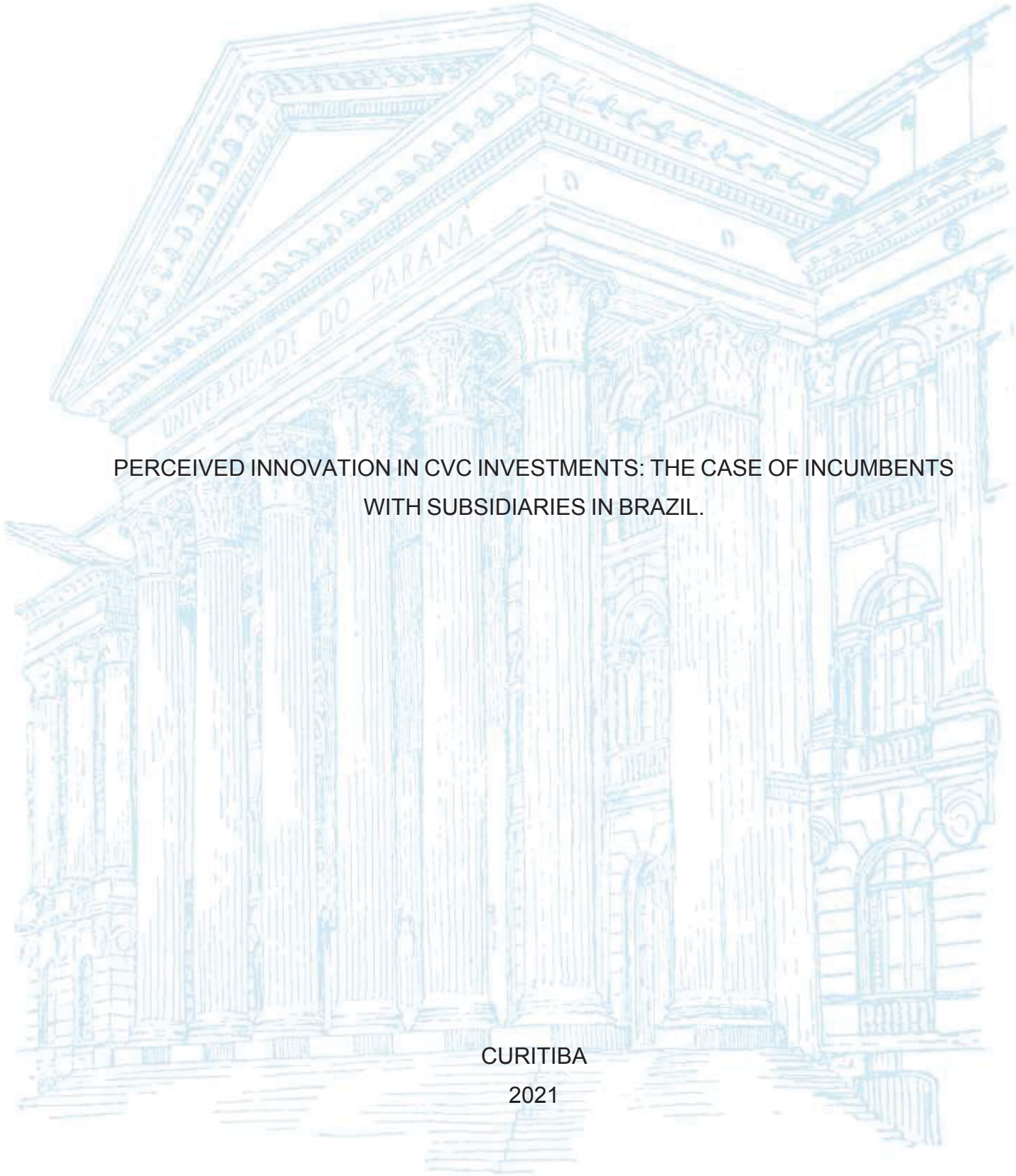

PERCEIVED INNOVATION IN CVC INVESTMENTS: THE CASE OF INCUMBENTS WITH SUBSIDIARIES IN BRAZIL.

CURITIBA

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PERCEIVED INNOVATION IN CVC INVESTMENTS: THE CASE OF INCUMBENTS WITH SUBSIDIARIES IN BRAZIL.

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Orientadora: Profa. Dra. Fernanda Salvador Alves

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To my parents.

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RESUMO

A dinâmica do mercado e sua rápida evolução, impulsionada principalmente pela tecnologia, desafiam até as empresas mais tradicionais a mudar. Para evoluir e acompanhar as mudanças do mercado, as empresas buscam tecnologias fora de seus limites organizacionais. A abordagem da Inovação Aberta (IA) demonstrou ser uma forma eficaz de buscar inovações externas. Uma estratégia de IA é o Corporate Venture Capital (CVC), o investimento minoritário de grandes organizações em startups. Os objetivos do CVC são principalmente estratégicos, ou uma combinação de objetivos financeiros e estratégicos. Essa abordagem foi identificada como uma forma de explorar novas oportunidades tecnológicas fora da organização, bem como melhorar as capacidades de mudanças internas. Embora existam estudos sobre OI e CVC disponíveis, poucos são focados em analisar ambos os temas e os efeitos estratégicos do CVC em termos de resultados em inovação por tipo e intensidade. Além disso, os estudos disponíveis raramente se concentram na análise do fenômeno no Brasil. Portanto, o objetivo desta dissertação é enriquecer e estender a pesquisa existente, analisando como empresas com subsidiárias no Brasil percebem a inovação dos investimentos em CVC. A partir da avaliação de empresas que planejam ou já estão realizando investimentos em CVC, foi possível inferir que o objetivo principal para esse tipo de investimento é estratégico. Além disso, as organizações seguem um padrão, primeiro buscam implementar outras estratégias OI, consideradas menos arriscadas, antes de investir em novos empreendimentos por meio do CVC. Além disso, essa abordagem de investimento foi identificada como uma forma eficaz de grandes organizações se envolverem com startups, não apenas para aumentar o acesso à inovação, mas também para impulsionar capacidades internas de inovação.

Palavras-chave: Corporate Venture Capital. Inovação Aberta. Inovação por Tipo. Inovação por Intensidade.

ABSTRACT

Market dynamics and its rapid evolution, mainly driven by technological developments, challenge even the most traditional companies to change. In order to evolve, companies search for technologies outside their organizational boundaries. The Open Innovation (OI) approach has been demonstrated to be an effective way of pursuing external innovations. A type of OI strategy is the Corporate Venture Capital (CVC), the minority investment of large organizations in entrepreneurial ventures. The objectives of CVC investments are mainly strategic, or a combination of financial and strategic goals. CVC has been identified as a way of exploring new technological opportunities outside the organization, as well as improving internal change capabilities. Although there is a range of findings on OI and on CVC available, there are few studies focused on analyzing both approaches and the strategic results of CVC in terms of innovation outcomes by type and intensity. Moreover, the studies available are rarely focused on analyzing the phenomenon in Brazil. Therefore, the objective of this dissertation is to enrich and extend existing research by analyzing how incumbents with subsidiaries in Brazil perceive innovation from CVC investments. Based on the evaluation of companies that are planning or already are carrying out CVC investments, it was possible to infer that the main objective behind CVC investments is strategic. Additionally, organizations follow a pattern of first implementing softer OI strategies before investing in external new ventures through CVC. Moreover, CVC has been identified as a powerful approach to engage with external young ventures, not only to enhance access to innovation, but also to boost internal innovation capabilities.

Keywords: Corporate Venture Capital. Open Innovation. Innovation by Type. Innovation by Intensity.

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LIST OF ACRONYMS

CV – Corporate Venturing

CVC – Corporate Venture Capital

IP – Intellectual Property

NVCA – National Venture Capital Association

OI – Open Innovation

R&D – Research and Development

USA – United States of America

USD - United States Dollar

VC – Venture Capital

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SUMMARY

1. INTRODUCTION

Innovation plays a central role on economic growth and development (Fagerberg, 2018). The Oslo Manual (2018) considers innovations as changes in products, processes, and new organizational or marketing approaches, which particularly influences the activities of companies. Even the most traditional companies must rapidly respond to the fast-moving pace of technological changes. Thus, the pressure of the market compels companies to keep up with their competitors by increasing technological capacity (Fagerberg, Martin, & Andersen, 2013).

Historically, centralized Research and Development (R&D) labs were the companies' answer to changes and uncertainties associated with the development and launch of innovations (Chesbrough, 2003). However, with time, internal investments in R&D have shown fewer positive results and are not enough to keep pace with the rapid progress of innovation (Gompers & Lerner, 2000). In order to increase competitive capabilities, organizations should not depend exclusively on existing core technologies and current business models. In this view, the OI approach has emerged, as a way for companies to search and access innovation externally (Pinkow & Iversen, 2020).

Chesbrough (2003) in his seminal work "Open Innovation: The New Imperative for Creating and Profiting from Technology" highlighted that companies should look outside of its borders and use external knowledge and paths to market when innovating. "OI combines internal and external ideas into architectures and systems whose requirements are defined by a business model" (Chesbrough, 2003, p. xxiv).

The work developed by Chesbrough (2003) has brought to light the several aspects or 'erosion factors', as named by the author, that have changed the landscape of Closed Innovation toward the OI approach, such as: growing number of workers available, better universities, decrease of US hegemony, and the growth of VC investments, which has supported startups to growth. The concept of OI theorized by the author, "the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively" (Chesbrough et al, 2006, p. 1), may be considered as the antithesis of the old models of Close Innovation.

Within OI strategies, companies' search for knowledge from external partners and, thereby, foster their innovation process (West & Bogers, 2014), increase knowledge (Dushnitsky, 2005; Wadhwa & Kotha, 2006), and achieve higher rates of innovation (Dushnitsky & Lenox, 2005). Studies have revealed to what extent OI contributes to innovation, e.g., Laursen & Salter (2006) have argued that companies that are open to external knowledge sources have potentially superior innovation levels. Sofka & Grimpe (2010) emphasize that the effectiveness of in-house R&D is boosted when combined with a market-oriented strategy, and Cheng & Huizingh (2014) found out that OI is positively related to companies' innovation performance.

There are different ways a company can operate OI, the inbound (or outside-in), the outbound (or inside-out) approaches, and the combined method, when both approaches are used simultaneously (Zhou, Yao, & Chen, 2018). In the first model, external knowledge flows inside the firm, while in the second, knowledge flows from inside the company to the outside (Gassmann & Enkel, 2004). In the context of OI, incumbents are able to gain access to knowledge from external young ventures using CVC investments (Pinkow & Iversen, 2020), this investment strategy is the major aspect analyzed in this dissertation.

CVC investments is part of external corporate venturing (CV) strategy which involves a corporation's equity investment in a new venture (Zahra et al, 2016). Companies engage with startups to keep up with entrepreneurial activities, observe the latest technologies available (Belderbos, Jacobc & Lokshind, 2018), and to become more innovative (Weiblen & Chesbrough, 2015).

CVC objectives might include financial as well as strategic outcomes (Colombo & Murtinu, 2016), differently from what is seen in Venture Capital (VC) investments. While VC's major focus is to achieve financial goals by investing in new ventures (Alvarez-Garrido & Dushnitsky, 2016), investments of corporations in external new ventures (CVC) have a broader perspective, considering strategic advantages and possible innovation outcomes, rather than merely financial returns (Chesbrough & Tucci, 2002).

From a corporation viewpoint, CVC is an external mode of CV (Henderson & Leleux, 2001; Kann, 2002; Keil, 2000) and from the perspective of new ventures, a source of financial support (Gompers & Lerner, 2000). In this study the first perspective

is analyzed, CVC investments are going to be analyzed from the perspective of corporations and the perceived innovations resulting from this approach.

Despite gaining momentum today, investments of large and established corporations in young external ventures are not new, at least, since the 1960s there is evidence of this practice (Dushnitsky & Lenox, 2005; Dushnitsky & Lenox, 2006; Gompers & Lerner, 2000). During the first ten years of this movement, one of every four Fortune 500 firms have launched corporate venture programs (Fast, 1978). According to CB Insights report, “The History of CVC”, there are four waves of CVC investments, the first named Conglomerate Venture Capital, from the 60’s to the end of the 70’s; the second happened in Silicon Valley from the early 80’s to 1994; the third from 1995 to 2001; and the fourth from 2002 to the present is known as the ‘Unicorn Era’. CVC investment cycles have accompanying waves of economic growth and decline, as well as oscillations in the traditional VC market (Gompers & Lerner, 2000). Scholars have highlighted CVC as one of the main channels through which new ventures can tap into the knowledge of incumbent firms and improve their innovation performance (Basu, Corey, Phelps & Kotha, 2016; Alvarez-Garrido & Dushnitsky, 2016).

The systematic review of this dissertation has brought to light different aspects regarding CVC investments: the innovation performance of CVC investors, the external knowledge acquisition through these types of investments, the relationship with internal R&D and governance factors involving CVC, as well as geographical investment patterns, and the exploration/exploitation aspects of CVC. Synthesizing the information from the examined articles, the findings can be deconstructed into different topics of analysis regarding CVC investments. i) The innovation performance and innovation outcomes from the CVC investments. ii) The impact of portfolio as well as geographic diversity on corporate innovation performance and possible innovation outcomes. iii) The possible gains in terms of external knowledge acquisition, the relationship with internal R&D, and other potential collaborative opportunities of this type of investments. iv) The governance factors involving CVC investments and the different patterns of CVC investments according to the region. v) The exploration/exploitation aspects of open innovation and how it influences corporate innovation performance.

As of this dissertation's literature review reveals, there are several studies addressing the themes OI and CVC, however not much attention has been paid to the correlation between CVC and OI and fewer studies are related to the CVC investments outcomes in terms of type and intensity of innovation focusing on the Brazilian market.

In view of what has been introduced and based on the assumption that one of the objectives of companies engaging in CVC investments is to foster innovation, this dissertation aims to increase knowledge about CVC investments (the motivations and the process development), as well as the perceived innovation (in terms of type and intensity) from this type of investment strategy. Additionally, the object of analysis of this research are incumbents with subsidiaries in Brazil that carry out CVC investments or that are in the process of implementing it. This study seeks to enrich the knowledge about CVC as a way to enhance companies' access to new technologies in the context of OI approach and the possible innovation outcomes of this process considering the Brazilian risk investment landscape.

1.1 Research Problem

Considering what has been presented in the introduction, the following research problem has been developed: How do incumbents with subsidiaries in Brazil perceive innovation from CVC investments?

1.2 Research Objectives

1.2.1 Main Objective

Deriving from the research problem, the main objective of this research is: To understand how incumbents with subsidiaries in Brazil perceive innovation from CVC investments.

1.2.2 Specific objectives

Following the main objective, specific objectives have been established:

a. Describe the motivations for CVC investments by incumbents with subsidiaries in Brazil.
b. Describe the process development of CVC investments by incumbents with subsidiaries in Brazil.
c. Identify the innovations by type (product, process, market, and organizational) perceived by incumbents with subsidiaries in Brazil in CVC investments.
d. Identify the innovations by intensity (incremental and radical) perceived by incumbents with subsidiaries in Brazil in CVC investments.

1.3 Justification

For the past years, companies have faced fierce competition from newcomers. Outdated business models of established companies have open opportunities for startups to enter and sometimes rapidly dominate the market (Crittenden et al, 2019). Incumbents often have long-term established business models, structures, and procedures. Immersed in inertia, these companies have difficulties to embrace changes and new technologies (Obal, 2013).

Braganza, Awazu, & Desouza (2016) have evaluated the innovation inhibitors for established companies: “i) pursuit of stability; ii) risk avoidance; iii) lack of options; and iv) complex power structures” (p: 47). In view of that, companies are searching for ways to enhance their innovation capabilities. The number of CVC investments in the past years evidences this reality. A report released in 2016 by INSEAD and 500Startups argues that more than a half of the Forbes Global 500 firms have some sort of startup engagement.

From 2013 to 2018 CVC investments have increased considerably. While in 2013 the number of deals with CVC investments was 1,029 valued USD 10.6 billion, in 2018, CVC investors took part in 2,740 deals valued USD 53 billion (Insights, 2016). Despite the pandemic, CVC investors continue to actively participate in deals in the

US, this type of funding represented more than 50% of deal value in 2020, according to Pitchbook data (Pitchbook, 2020). Almost all the biggest R&D spenders in the world are cooperating with startups. This shows the shift from internally focused R&D towards a deeper collaboration with new ventures.

Brazil is following this trend. According to the Corporate Venture Capital Report 2020, companies have been increasing the number of investments in startups in Brazil, 70% of CVC investment in Brazil is made by multinationals with subsidiaries in the country and circa 30% by national companies, in 2019 the CVC invested volume has reached more than USD150 million.

CVC investment motivations can be strategic, it can either boost or at least complement existing strategies; explore new opportunities, or solely focus on economic profits (Chesbrough, 2002). This is one of the main differences between VC and CVC investments. CVC investments and higher innovation outcomes are positively related in comparison to what has been found in investments performed by Independent VC Funds (Alvarez-Garrido & Dushnitsky, 2016). These investments are recognized as an innovation pathway for established companies additional to its core business (Dushnitsky & Lenox, 2005; Wadhwa & Kotha, 2006; Van de Vrande et al, 2006; Narayanan et al, 2009).

One of the objectives of companies engaging in CVC investments is strategic, as possible window on future technologies (Ceccagnoli, Higgins, & Kang, 2018). As categorized by Battistini et al (2013) the scope of CV activities can be “strategic, financial, and balanced” (p.37), this is one of the aspects analyzed in this dissertation, to enhance the knowledge on the main motivations behind the investment on external new ventures through CVC. In addition to analyzing why companies invest in CVC, this study aims to investigate how is the process development of CVC investments by incumbents. Through enhancing the knowledge on existing procedures to implement CVC investments this research aims to support the decision-making process of companies before investing in external new ventures.

Whereas one of the strategic aspects of CVC investments is the access to new technologies available outside the limits of the organization, there is not much research concerning the innovations by type: product, process, market, and organizational (Oslo Manual, 2018), as well as by intensity (incremental and radical) perceived by

companies when applying this strategy. A further analysis of the innovation potential might as well support company's expectations around CVC investments.

The importance of this type of innovation strategy has awakened the interest of scholars on the subject. Röhm (2018) has indicated an exponential growth in the number of articles regarding CVC in the past years. The relationship of CVC investments and companies' innovation performance have been studied, however, most articles are focused on companies based in North America, Europe, and Asia, as indicated on the systematic review available at Appendix I of this dissertation. Considering this research gap, the present study has the objective to analyze how this phenomenon occurs in Brazil.

According to what was described above and with the systematic review, there are few studies focusing on Brazil. Additionally, as CVC investment is an incipient phenomenon in the country, there is limited data on this type of investment in comparison with data available in other regions, namely Europe, USA and Asia. Thus, in order to avoid an information gap, only data from companies located in Brazil have been analyzed in this study.

1.4 State of the Art

To analyze the state of the art, a research has been carried out in three different databases: Capes Portal, Scopus, and Web of Science. The filters used to conduct the literature research were: "Open Innovation", "Corporate Venture Capital", and "Open Innovation and Corporate Venture Capital" (both terms combined). A detailed explanation of the filters used can be found in Appendix I of this dissertation. Additionally, the following table shows the results in numbers of the research conducted using the three filters mentioned above.

Table 1. Systematic review filters and results

Filters	**Database**		
	Capes Portal	**Scopus**	**Web of Science**
"Corporate Venture Capital"	940	90	58

“Open Innovation”	2.012	1.363	804
“Corporate Venture Capital and “Open Innovation”	93	9	3

Note. Developed by the author (2020).

The systematic review has brought to light the lack of research on OI and CVC as phenomena capable of enhancing product, process, organizational, and market innovation in terms of incremental and radical innovation of incumbent firms. Another product of the literature review is the absence of research regarding the subject in Brazil or Latin America region. The findings of the systematic review call for further analysis on both themes OI and CVC and considering the Brazilian landscape.

1.5 Dissertation Structure

This dissertation is structured into the following sections: introduction, theoretical foundation on innovation and OI, theoretical foundation on VC and CVC, methodology, case descriptions, case analysis, conclusion, final remarks, research limitations, future research, and it is finalized by references and appendices. In the first section the introduction is presented followed by a contextualization of the considered theme - the general objective and the specific guiding objectives - as well as its theoretical and practical justifications.

The second section covers the theoretical-empirical basis, in which the theoretic scope of Innovation and OI in terms of its origin and development. The third section provides a theoretical overview of VC and CVC. The fourth section is devoted to the methodological procedures adopted in this research. The fifty section presents the case descriptions and the sixty section the case analysis. In the seventh section the conclusion, final remarks, study limitations and future research are presented followed by the references and appendices of this dissertation.

2. INNOVATION

Schumpeter was one of the first scholars to analyze the innovation phenomenon as a major aspect behind economic and social changes, which, for long, has not been recognized as a topic of major discussion (Fagerberg, 2013). In 1942, the author preconized the term creative destruction, recognizing the destructive aspect of innovation, when the new substitute the old (McCraw, 2009). Thus, innovation might be characterized as changes that break the status quo, displacing existing states of stability (Schumpeter, 1961). According to Schumpeter, there is a clear distinction between inventions and innovations, which is basically the difference of having an idea and of bringing this idea to life (Fagerberg, 2013). Following Schumpeter, other authors started to study and analyze this phenomenon. Kline & Rosenberg (1986) characterized innovation as:

> A new product, a new process of production, the substitution of a new material, newly developed for a given task, in an essentially unaltered product, the reorganization of production, internal functions, or distribution arrangements leading to increase efficiency, better support for a given product, or lower costs; or an improvement in instruments or methods of doing innovation (Kline & Rosenberg, 1986, p.283).

Access to innovation is among the top priorities for corporates worldwide. Companies faced with rapidly changes and challenges impose by innovation and technology are reevaluating their innovation strategies (Enkel et al, 2009) specially by adding OI practices such as “Intellectual Property licensing, academic partnerships, innovation consortia, open-source platforms, and venture capital investments” (Battistini et al, 2013, p.32).

According to the Oslo Manual (2018) *“*a common feature of an innovation is that it must have been implemented. A new or improved product is implemented when it is introduced on the market. New processes, marketing methods or organizational methods are implemented when they are brought into actual use in the firm’s operations*”* (p.47). There are different forms in which innovations can be classified, among them, by type. In this classification, there is a characterization used by the Oslo Manual (2018) “product (good or service), or process, a new marketing method, or a

new organisational method in business practices, workplace organisation or external relations" (p.46). Further classification of innovation can be found by Tidd & Bessant (2018): product, process, position, and paradigm. For the purpose of this research, the Oslo Manual (2018) definition of types of innovation is going to be applied.

Product innovation is defined as "the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics" (Oslo Manual, 2018, p.48). Gaut (2018) classifies it as "a product, made available to potential users, that is new or significantly changed with respect to its characteristics or intended uses" (p.619). As described by Tidd & Bessant (2018), product innovation is described as changes in what is offered by the organization in terms of product and services.

Process innovation is "the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software" (Oslo Manual, 2018, p.49). A similar definition has been introduced by Tidd & Bessant (2018), as changes in the methods used by a company to create and deliver its products or services. Reichstein & Salter (2006) have described process innovation as:

> New elements introduced into an organization's production or service operations input materials, task specifications, work and information flow mechanisms, and equipment used to produce a product or render a service with the aim of achieving lower costs and/or higher product quality (p.653).

Market innovation is "the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing" (Oslo Manual, 2018, p.49). What the Oslo Manual defines as "market innovation", Tidd & Bessant (2018) present as "position innovation", which is "changes in context in which the products / services are introduced". Gaut (2018) has further defined market innovation and highlighted the communicational aspect of it, as "a new or significantly changed method of promoting products of the institutional unit" (p.619).

Gault (2018) also characterized organisational innovation as an approach that might enhance company's productivity and quality of work, as well as permit knowledge and information exchange, which can deeply affect its competencies, and ability to learn and use new technologies. The focus is to foster organizational structures, knowledge acquisition, and necessary environmental adjustments.

The Oslo Manual (2018) defines organisational innovation as "the implementation of a new organisational method in the firm's business practices, workplace organisation or external relations" (p.51). Furthermore, following Tidd and Bessant (2018) paradigm innovation consists in "changes in the underlying mental models that frame what the organization does" (p.21).

Regarding intensity, innovations can be defined either as radical or incremental. According to the innovation space model developed by Tidd & Bessant (2018) there is a distinction between incremental and radical innovation, whereas in "incremental innovation companies do what they do, but better, in radical innovation, they do something different" (p.25).

A further description of incremental and radical innovation can be found in the work of Norman & Verganti (2014), "incremental innovation tries to reach the highest point on the current hill. Radical innovation seeks the highest hill" (p.78). Lennerts, Schulze, & Tomczak (2020) defined incremental innovation as relatively small adjustments in existing products, as an example, "small changes in the technology, design and/or fresh look, product relaunches, and line extensions that are new for the company but not new for the market" (p.2).

Lennerts et al (2020) define radical innovations as essential technological changes of a company. In general, radically innovative products are new to the company and it can also be new to the industry and offer significant and unexpected benefits to the customers. This type of innovation involves novel insights that often are not among firm's available knowledge and/or competences, being necessary to search outside its own borders (Flor, Cooper & Oltra, 2018).

According to Dahlin & Behrens (2005) criteria of radicalness, an innovation is radical when it is "(1) novel; (2) unique; and (3) has an impact on future technology" (p.717). From the first two conditions it is possible to characterize radical inventions before they enter the market; whereas within the third condition, it is possible to

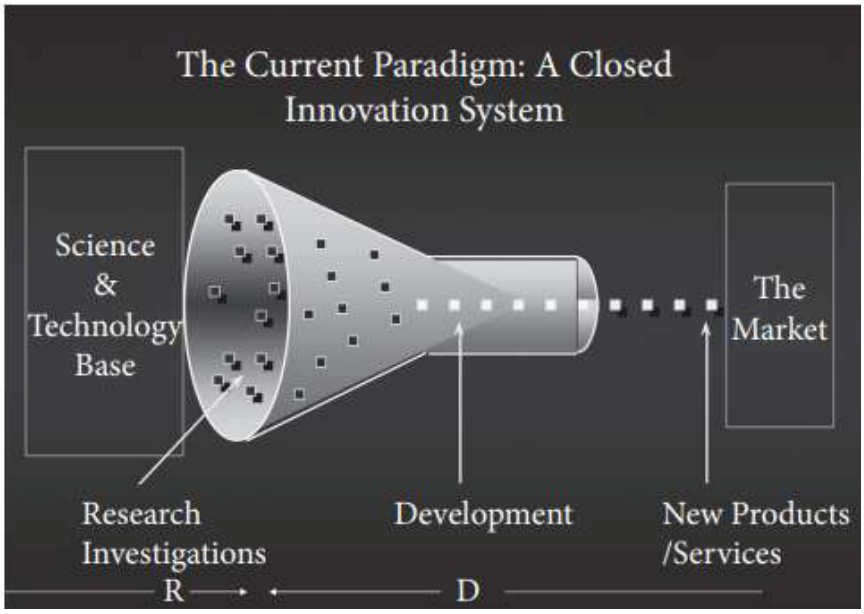
establish whether the innovation has been a driver to future change. Furthermore, for an innovation to be considered radical, the emphasis is a dramatic departure from existing products (Edwards-Schachter, 2018).

Christensen & Rosenbloom (1995) have differentiated these two types of innovations. While in radical innovation there is a new technological direction, in the incremental innovation, the progress is made within an established path. Moreover, in radical innovation there is a redefinition of performance trajectory, whereas incremental innovation sustains the rates of improvement (Christensen and Bower, 1996).

From a managerial point of view, radical innovation projects can be seen as uncertain; thus, they involve the exploration of unknown markets, business models and technologies with long term results expectation (Kristiansen & Ritala, 2018). For this reason, a growing number of established companies are joining forces with new ventures (Gans, 2016; Kohler, 2016; Spender et al, 2017; Viardot, 2017). The objective behind this collaboration is diverse including, profit from their knowledge, creativity (Eckblad & Golovko, 2016; Zhao, Sun, & Xu, 2016), organizational agility and innovativeness (Di Lorenzo & Van de Vrande, 2016).

Innovation can also be classified according to the interaction with other actors, open or closed innovation. In order to illustrate the main differences between a close and OI model the following figures are exhibited. Figure 1 reveals the main aspects of a Closed Innovation Model, and the figure 2 the OI approach.

Figure 1. Closed Innovation Model

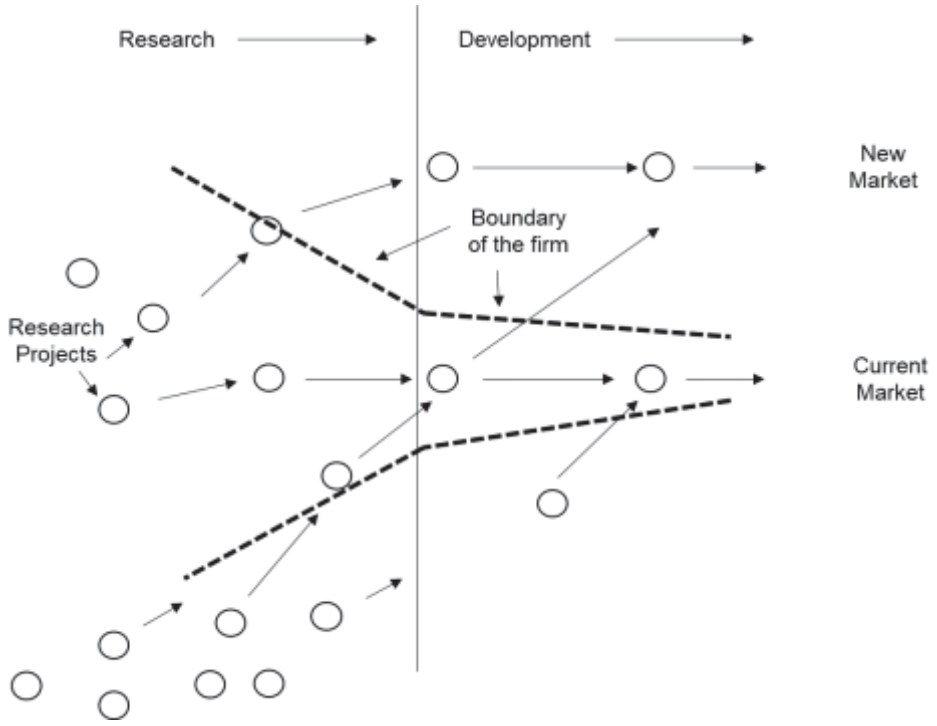


Note. From Chesbrough, 2019, p. 35.

For years, Closed Innovation has been the main source of technological developments (Peris-Ortiz, Ferreira & Fernandes, 2019). The figure above represents this traditional model of innovation, where the R&D process is conceived in closed doors, some projects continue and in the form of new products and services reach the market, while others are discontinued.

However, the erosion factors (Chesbrough, 2003) - mentioned before - pushed companies towards an open approach for innovation. Fundamentally, OI theory recognizes that knowledge is dispersed throughout the society (Saebi & Foss, 2015). Organizations around the world do not centrally control knowledge and ideas, contrarily, their survival relies intensely on their ability to engage with the external world (Le, Thi Mai Dao, Pham & Thuy Tran, 2019). The following figure shows the first model developed by Chesbrough (2003) of how a company can engage with external players in order to develop new technologies and bring them into its current as well as new markets.

Figure 2. Open Innovation Model



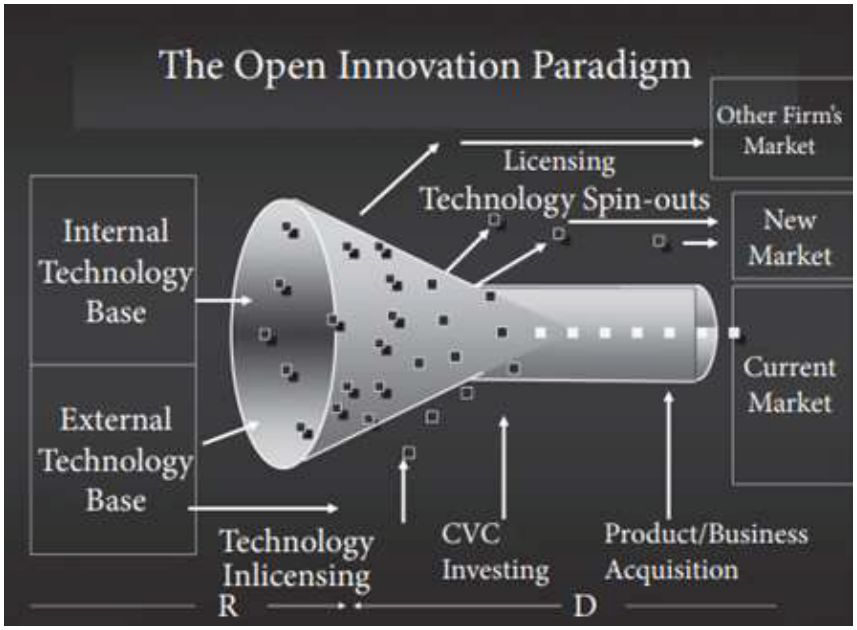
Note. From Chesbrough, 2003, p. xxv.

The essence of the paradigm remains, however, from 2003 on, the concept has evolved. The field of OI has undergone a growth in academic attention (e.g., Dahlander & Gann, 2010; Chesbrough & Bogers, 2014; Randhawa, Wilden, & Hohberger, 2016; West & Bogers, 2014). This has led to new perceptions on the possible inflows of knowledge companies are able to use to accelerate internal innovation (Bagherzadeh, Markovic, Cheng & Vanhaverbeke, 2018), as well as outflows which can help to increase outward benefits of innovation (Alfaro, Flor & Oltra, 2017).

The following figure shows how the model has advanced from 2003 to 2019. In 2019, Chesbrough has released a book called “Open Innovation Results: Going Beyond the Hype and Getting Down to Business” with a broader overview of the paradigm. As he characterizes, OI is the opposite to the traditional and internally focused innovation model, it is “a distributed innovation process based on purposively managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organization’s business model”

(Chesbrough, 2019, p.30). A noticeable change in the updated model and relevant for the purpose of this study, is the introduction of CVC investing as an external technology source, as shown subsequently, in Figure 3.

Figure 3. Updated Open Innovation Model



Note. From Chesbrough, 2019, p.36.

The presented figure symbolizes a different model of innovation, where the R&D process is conceived inside the company as well as outside its borders (Natalicchio, Ardito, Savino & Albino, 2017). The above figure shows three different modes for companies to apply OI, among them are the CVC investments, and Merger and Acquisitions (M&A).

According to Tong and Li (2010), the major difference between M&A and CVC investments is that in the first, a firm buys a target company while in the second a firm takes an equity of a private entrepreneurial company. The authors used the real option theory to understand in which circumstances a company uses CVC investments versus the M&A approach, as a conclusion, they found out that under uncertainty firms prefer to have flexibility and, therefore, lean towards the CVC investment strategy.

The licensing strategy differs from the approaches of closed innovation and OI. When OI is applied, projects continue and reach not only the current market, but

additional ones and discontinued projects are not discarded as it used to be in Closed Innovation practices; instead, they can be licensed and reach the market by other firms (Bagherzadeh, Markovic, Cheng & Vanhaverbeke, 2018).

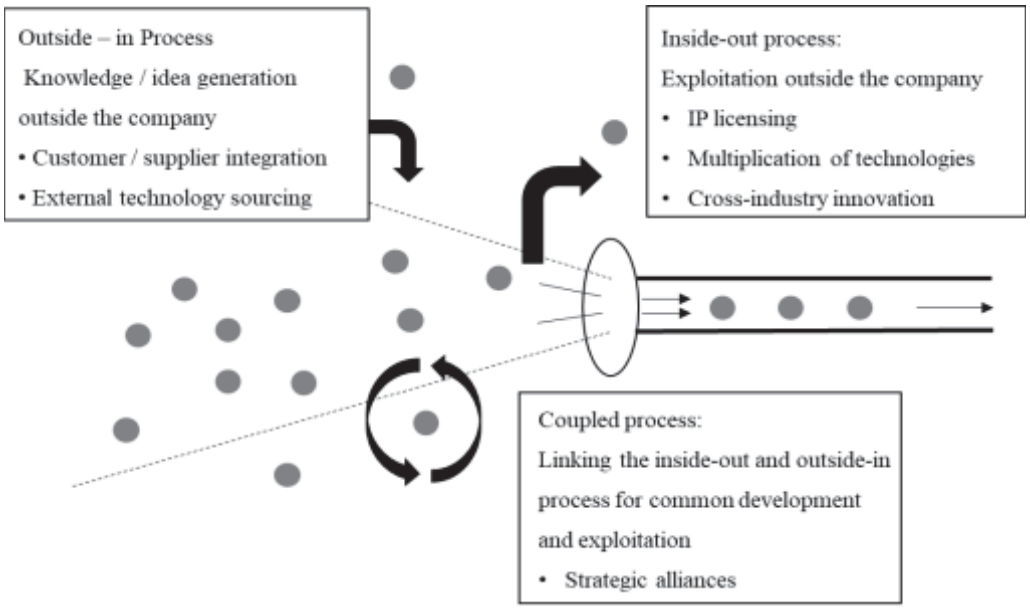
Although OI has been a theme of major discussion (Alfaro et al, 2017), it is important to differentiate OI from other approaches, such as Open Source (von Hippel, 2005). There is often a misapprehension between OI and Open Source; although, both views see openness as an important source of innovation, there are differences between them. The Open-Source ignores the business model and does not take into consideration innovation projects that are not used (von Hippel, 2005). Another controversy is regarding the role of Intellectual Property (IP) in OI, which can be considered either an incentive towards innovation (Chesbrough, 2012), or a treat and a barrier to OI according to von Hippel (2005).

Scholars such as Holgersson, Granstrand & Bogers (2018); Dziallas & Blind (2019); and Chesbrough (2019) argue that companies should be legally protected and supported by business models to enable OI processes to happen. Whereas other studies in which the central argument is towards a free, open, and distributed innovation, consider IP protection as unnecessary (Henkel & von Hippel, 2004; von Hippel & Von Krogh, 2006; von Hippel, 2007).

The main types of OI activities include outside-in activities, inside-out activities, with possibility to occur combined or in isolation. A quantitative study of OI in large firms has been done by Chesbrough & Brunswicker (2013), in which the authors identified different models of OI, the Inbound (or Outside-in OI) and the Outbound (or Inside-out) approaches. Companies can either complement internal R&D by external knowledge acquisition and/or monetize through innovation licensing (Gassmann & Enkel, 2004).

An organization that practices Outside-in OI will utilize external ideas and technologies in their own business (Usman & Vanhaverbeke, 2017), while the Inside-out OI process will allow unused internal ideas and technologies to reach the market (Dahlander & Gann, 2010; Chesbrough & Bogers, 2014; Michelino et al, 2014; Bagherzadeh et al, 2019). Gassmann & Enkel (2005) have developed a Coupled OI approach, as shown in the following figure.

Figure 4. The Outside-in, Inside-out and Coupled OI processes



Note. Adapted from Gassmann & Enkel, 2005, p.7. Translated by the author.

By applying Outside-in OI strategies, companies search for knowledge from external partners (West & Bogers, 2014) to increase knowledge (Dushnitsky, 2006; Wadhwa & Kotha, 2016) and achieve higher rates of innovation (Dushnitsky & Lenox, 2005). Startups have shown innovation and disruption capacity aligned with agility and flexibility which have provoked the interest of large corporations (Spender et al, 2017).

There are several ways in which a company can interact with new ventures (Kupp, Marval, & Borchers, 2017). In this study, the focus is on incumbent's engagement with startups, more specifically, throughout CVC (Belderbosa, Jacobc, & Lokshind, 2017). Evidence suggests that CVC investing potentially increases the possibility of incumbents to benefit from emerging technologies from startups (Benson & Ziedonis, 2009), and as a way to foster innovation capabilities in response to the trend towards this OI approach (Birkinshaw & Hill, 2003; Dushnitsky & Lenox, 2005; McGrath, Keil, & Tukiainen, 2006).

The following table summarizes the concept of innovation regarding types, intensity, and its relationship with the environment.

Table 2. Innovations by type, intensity, and relationship with the environment

Classification		Concept	Authors
Innovation types	Product	"the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses".	Oslo Manual, 2018, p.48
	Process	"the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software"	Oslo Manual, 2018, p.49
	Market or Position	"the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing"	Oslo Manual, 2018, p.49
		"changes in context in which the products / services are introduced".	Tidd & Bessant, 2018, p.21
	Organizational or Paradigm	"the implementation of a new organisational method in the firm's business practices workplace organisation or external relations"	Oslo Manual, 2018, p.51
		"changes in the underlying mental models that frame what the organization does"	Tidd & Bessant, 2018, p.21
Innovation intensity	Incremental	"in incremental innovation, companies do what they do, but better,	Tidd & Bessant, 2018, p.25
	Radical	"in radical innovation, companies do something different"	Tidd & Bessant, 2018, p.25
Relationship with external environment	Open	"is a distributed innovation process based on purposively managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organization's business model"	Chesbrough, 2019, p.30
	Close	"companies must generate their own ideas and then develop them, build them, market them, distribute them, service them, finance them, and support them on their own"	Chesbrough, 2003, p.xx

Note. Developed by the author (2020).

After the presentation of concepts, types of innovation, as well as the advantages of OI, the next topic has been designed to cover the topic of CVC investments as a form of OI strategy.

3. CORPORATE VENTURE CAPITAL

There are different sources of innovation financing, such as: Angel Investment, Incubators, Accelerators, Strategic Investors (Corporate Groups), Growth Equity Investors, Private Equity Firms, Debt Investors and CVC (NVCA, 2019). According to Bonini, Capizzi, & Cumming (2019), funding options for entrepreneurial activities are diverse, “technology parks, startup incubators and accelerators, business angels and angel investment organizations, equity crowdfunding platforms, venture capital funds, corporate seed funds and institutional investors” (p.133) are part of a new financing ecosystem for startups.

A systematic review completed by Röhm (2018) regarding CVC have found out that VC and CVC are highly used OI funding sources of startups. Differently from traditional VC, corporate investors have a major focus on establishing long-term value to the invested firms (Drover, Busenitz, Matusik, Townsend, Anglin & Dushnitsky, 2017). VC has been an important funding source for new, high technological, and risky ventures, which could face obstacles attracting traditional financial support (Gompers & Lerner 2001; Gompers et al, 2006).

> Venture Capital firms are professional, institutional managers of risk capital that enable and support the most innovative and promising companies. VC supports new ideas that 1) could not be financed with traditional bank financing, 2) threaten established products and services in a corporation or industry, and 3) typically require five to eight years (or longer) to reach maturity (NVCA Yearbook, 2019, p.7).

For Alvarez-Garrido & Dushnitsky (2016, p.821) independent VCs “invest in entrepreneurial ventures facing substantial technology, business model, and operational risk with the goal of achieving financial returns”. In a similar direction to independent VCs, incumbent firms can support innovative new ventures in exchange to equity share (Drover et al, 2017).

Corporate Venture Capitalists are gradually increasing their presence in the risk investment scenario (Dushnitsky, 2012; Batisttini et al, 2013). In 2018, about 51% of VC deals had CVC involvement (NVCA, 2019) and corporate CVC units became more frequent (Himler, 2017).

As mentioned before, CVC is a type of OI, involving the cooperation between companies and startups, the following table shows the different combination types of engagement between corporations and startups. If the primary goal is to acquire knowledge from external startups the company should use Outside-in OI (or Inbound OI). Whereas, if it is to push corporate innovations to the outside world using startups methods, the Inside-out OI (or Outbound OI) should be applied (Bagherzadeh et al, 2019; Natalicchio et al, 2017). The following table represents the type of corporate engagement in startups.

Table 3. Corporate engagement with startups

		Direction of Innovation Flow	
		Outside-In	**Inside-Out**
Equity Investment	Yes	**Corporate Venturing** Participate in the success of external innovation and gain strategic insights into non-core markets.	**Corporate Incubation** Provide a viable path to market for promising corporate non-core innovations.
	No	**Startup Program** Insource external innovation to stimulate and generate corporate innovation.	**Startup Program (Platform)** Spur complementary external innovation to push an existing corporate innovation (platform).

Note. Chesbrough, 2019, p.114.

In the Outside-in OI the innovation flows from outside to the inside, as mentioned above. In the CV strategy there is equity investment involved in the collaboration strategy. This type of collaboration strategy can be further analyzed in Figure 5 of the present study.

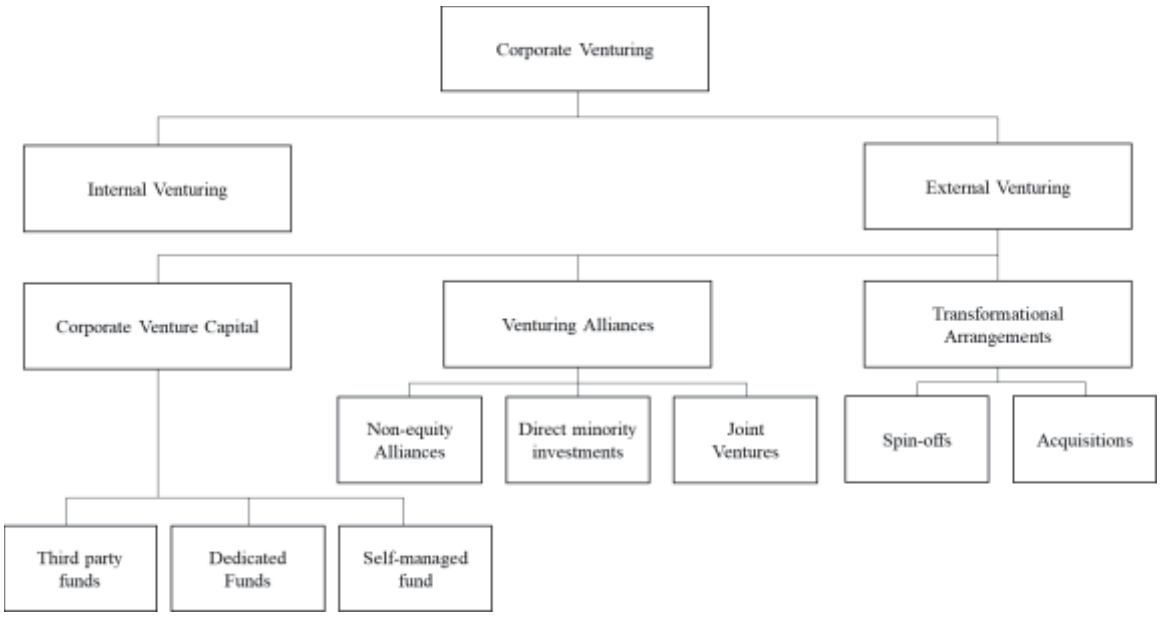
Internal and external activities are among CV initiatives (Titus, House & Covin, 2017). Internal efforts are those performed using existing organizational borders, whereas the external approach aims to foster innovation outside company's limits (Keil, 2000). There are several forms to perform external CV activities, Licensing, Joint Ventures, Acquisitions, and CVC (Reimsbach & Hauschild, 2012). CVC involves a

minority equity investment of an incumbent in one or more new ventures to enhance access to new ideas, technologies, discoveries, and markets (Narayanan et al, 2009).

CVC and CV are strongly related (Röhm, 2018). From a Corporate Entrepreneurship perspective, CV can be seen as a process of exploring new opportunities by establishing new businesses (Narayanan et al. 2009). “CV is the set of organizational systems, processes and practices that focus on creating businesses in existing or new fields, markets or industries - using internal and external means” (Narayanan et al, 2009, p.59). External CV is considered an important tool to foster business innovation (Basu et al, 2016; Titus et al, 2017). Thus, it enables the access to new technologies, as well as strategic alliances with external players (Battisti et al, 2013).

The following figure, combining to the table 3, shows the types of CV used by established companies. The funding can be made by the investment of a corporation in a third-party fund. A second option would be by initiating a new fund by the corporate in partnership with a VC firm, the latter being designated to manage the fund. While a third option the corporation maintains a proprietary fund, “in a similar way to a traditional venture fund or simply as an investment subsidiary of the corporation” (Keil, 2000, p.110).

Figure 5. External Corporate Venture Approaches



Note. Adapted from Keil, 2000, p.109.

To better understand CVC, the following table highlights theoretical concepts from different authors on the subject.

Table 4. Major definitions of CVC

Author (s)	**Definition**
Dushnitsky & Lenox (2005. p: 948)	"Investments that consist of minority equity stakes in relatively new, not publicly traded companies that are seeking capital to continue operation".
Wadhwa & Kotha (2006. p:1)	"Externally equity investment made by established firms in privately held start-ups".
Gaba & Meyer (2008: p:980)	"When an established corporation creates a structurally distinct entity dedicated to making external equity investments in a portfolio of high-potential young enterprises".
Dushnitsky & Shaver (2009. p: 2)	"CVC investments are minority equity investments by established firms in entrepreneurial ventures".
Narayanan et al (2009. p:59)	"Equity investments made by incumbents in start-ups to gain access to their innovation, technologies, and other discoveries".
Napp & Minshall (2011. p:27)	"Equity investments by large corporations in entrepreneurial ventures that originate outside the corporation".
Lee et al (2015. p:1)	"A useful learning investment strategy to create diversified technological options for future change".
Belderbos et al (2018. p: 21)	"Knowledge-exploration instrument that can allow firms to access and recombine knowledge from distant technological and geographic contexts for improved technological performance".

Note. Developed by the author (2020).

For the purpose of this study, the concept of CVC used is a combination of Dushnitsky & Shaver (2009) and Narayanan et al (2009) definitions. "Minority equity investments by established firms in entrepreneurial ventures" (Dushnitsky & Shaver, 2009, p.2) in order to "gain access to their innovation, technologies, and other discoveries" (Narayanan et al, 2009, p.59).

CVC activities enable corporations to obtain access to novel technologies and economic return as a counterpart outcome of investment in an external new venture (Dushnitsky & Lavie, 2010). By obtaining small equity shares, the corporate is able to mitigate the risks and increase flexibility; thus, companies can prepare before deeply

investing in emerging industries and high-risk markets (Van de Vrande & Vanhaverbeke, 2013).

"Gaining market knowledge, gaining window on technology; expanding technology options; accessing complementary technologies; levering own technologies" (Napp & Minshall, 2011, p.28) are among the main strategic purposes of CVC investments. In the same direction, Battistini et al (2013) have classified the scope of CVC activities as "strategic, financial, and balanced. The strategic scope focuses on the acceleration of innovation, whereas the financial scope aims to diversification and financial return, and the balanced focus on both: strategic value and financial return" (p.37).

Dushnitsky & Lenox (2005) endorse this view. By analyzing CVC investments of more than 100 US-firms for the period 1990-99, they have observed that external CVC investment seems to be used by companies as complementary assets to internal R&D rather than in opposition to it. The authors further observed that even though CVC investments can have positive financial outcomes, firms engage in such activities for strategic reasons. "The raison d'être of CVC as an innovative mechanism is to access the pool of scientists and entrepreneurs who would be difficult to employ in the organization" (Dushnitsky & Lenox, 2005, p.951). Moreover, as the authors noticed, companies can use CVC as complementary strategy to internal R&D, including using their own expertise and R&D personnel. This corroborates to additional results of their research, which have found a greater success rate of CVC activities in companies with strong innovation capabilities and technical knowledge. Often, firms institutionalize CVC within a separate business, this arrangement helps them to keep up with the flexibility and fast pace observed in the VC world (Lee, Park & Kang, 2018; Weiblen & Chesbrough, 2015).

CVC investments might enable incumbents to move beyond their borders and learn about new technologies present outside their internal laboratories (Narayanan et al, 2009), as well as identify and exploit emerging technologies from startups (Dushnitsky & Lavie, 2010). As stated above, it should not be seen as a substitute for internal R&D (Dushnitsky & Lenox, 2005), instead as an instrument to monitor the availability of novel technologies, different markets, and business models (Maula et al, 2004; Global Corporate Venture Capital Survey 2008-09). Furthermore, CVC

investments in new ventures enable incumbents to diversify their technological portfolio and create options for the future ahead (Chesbrough, 2002; Van de Vrande & Vanhaverbeke, 2013).

High investment portfolio diversity allows better outcomes when there is engagement capability between both parts - investor and investee - (Van de Vrande et al, 2006; Wadhwa & Kotha, 2006). More specifically, the lower the technological distance between investor and invested venture is, the greater is the investment on innovation (Wadhwa & Koth, 2006), the knowledge transfer (Wadhwa et al, 2016) as well as the chances of CVC investments' success (Gompers, 2000).

Both parts - companies and startups - expect benefits coming from CVC investments. On the one side, startups partner with incumbents in order to complement their assets, increase their innovation capabilities, and commercialize their innovations (Gans & Stern 2000). On the other side, incumbents, cooperate with external new ventures in order to keep the pace in a highly competitive and dynamic environment (Dushnitsky & Lenox 2005)

Christensen (2013) shredded light on the problems incumbent firms face when creating disruptive innovations or new business models, and the partnership with innovative new ventures is considered a way to overcome these challenges. This cooperation is often institutionalized in the form of CVC as well as Startup Acceleration Programs (Block, Fisch, & van Praag, 2016). The following table highlights major possible advantages by the engagement of incumbents and startups.

Table 5. Expected benefits from incumbent-startup relation

From incumbent to startup	**From startup to incumbent**
Credibility, Branding, and Public Relations	Speed of operation
Distribution	Innovative image
Suppliers	Innovation
Funding	Culture

Note. Adapted from Bonzom & Netessine (2016).

Some of the expected outcomes for corporations engaging in CVC investments are speed of operation, innovative image, innovation, and culture. Considering the mentioned strategic outcomes of CVC investments, the main objective

of this research is to understand how incumbents with subsidiaries in Brazil perceive innovation from CVC investments. Additionally, the following methodological procedures were taken.

4. METHODOLOGICAL PROCEDURES

This chapter describes the methodology of this dissertation, in other words, the path towards the answer to the research question. The most relevant phases of the methodology are: 1) Problem Specification: divided into a) Research Problem and b) Research Questions; 2) Constitutive and operational definitions; 3) Research Design; 4) Research Classification; 5) Case Selection Criteria; 6) Data Collection Techniques; 7) Data Analysis; 8) Reliability and Validity, 9) Mooring Matrix, and 10) Research Method Limitation.

4.1 Problem Specification

This topic returns to the research problem that leads to this dissertation and research questions.

4.1.1 Research Problem

The research question is the central question that will conduct the entire study (Creswell & Creswell, 2018). Establishing it properly is essential to provide the researcher with the right focus on what is relevant to the research (Saldaña & Omasta, 2017). For the purpose of this study, the following research problem has been defined:

How do incumbents with subsidiaries in Brazil perceive innovation from CVC investments?

4.1.2 Research Questions

The research questions intend to demonstrate the direction of the study and were defined based on the specific objectives already outlined in the introduction of this project.

a) What are the motivations for CVC investments by incumbents with subsidiaries in Brazil?
b) How is the process of CVC investments developed by incumbents with subsidiaries in Brazil?
c) How do incumbent companies with subsidiaries in Brazil perceive innovations by type (product, process, market and organizational) in CVC investments?
d) How do incumbent companies with subsidiaries in Brazil perceive innovations by intensity (radical and incremental) in CVC investments?

4.2 Constitutive and Operational Definitions

Constitutive and Operational Definitions are essential for understanding a complex field, mainly through the use of abstract and technical terms that are not known to the reader (Kerlinger, 1980). Thus, in order to facilitate understanding, the constitutive and operational definitions of the terms used in this dissertation are described in this section.

Constitutive definitions (CD) are explanations taken from the dictionary and used around the world. In science, however, they are insufficient to meet scientific objectives. In this way, Operational Definitions (OD) emerge as a link between concepts or constructs and observations. In other words, it gives meaning to a construct and it specifies what is necessary to measure these constructs (Kerlinger, 1980). The CD and OD of this research are described below:

Corporate Venture Capital

CD: “Minority equity investments by established firms in entrepreneurial ventures” (Dushnitsky & Shaver, 2009, p.2) “to gain access to their innovation, technologies, and other discoveries” (Narayanan et al, 2009, p.59).

OD: CVC is going to be measured by Dushnitsky & Shaver (2009) three factors that characterize CVC investments: i) a combination of financial as well as strategic returns for companies investing in CVC activities, ii) the independency between both parts, and iii) the investment counterpart is a minority equity share.

Innovation

CD: “The implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations” (Oslo Manual, 2018, p.46).

OD: Innovation is going to be evaluated by implemented changes in a radical or incremental manner in product, process, market, and organization.

Product Innovation

CD: “The introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses” (Oslo Manual, 2018, p.48).

OD: Product innovations are going to be evaluated according to the “significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics (Oslo Manual 2018, p:48).

Process Innovation

CD: “The implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software” (Oslo Manual, 2018, p.49).

OD: The measure of process innovations the author is going to consider: “new elements introduced into an organization's production or service operations input materials, task specifications, work and information flow mechanisms, and equipment used to produce a product or render a serviced with the aim of achieving lower costs and/or higher product quality” (Reichstein & Salter, 2006, p.653).

Market Innovation

CD: “The implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing” (Oslo Manual, 2018, p.49) and the communicational and promotional methods used by the firm (Gaut, 2018).

OD: Market innovations are going to be analyzed due to the modifications on how products and/or services are launched into the market (Tidd & Bessant, 2018).

Organizational Innovation

CD: “The implementation of a new organisational method in the firm’s business practices, workplace organisation or external relations” (Oslo Manual, 2018, p.51).

OD: Organizational innovations are going to be evaluated by the degree in which they enhance organizational structures, the availability to gain knowledge, and perform adjustments when facing environmental changes (Gaut, 2018). Additionally, these innovations are also measurable by the cultural and mindset aspects that permeate an organization, as defined by the paradigm innovation developed by Tidd & Bessant (2018).

Incremental Innovation

CD: Norman & Verganti (2014) defined incremental innovation as an aspiration to “reach the highest point on the current hill” (p.78). This means, in incremental innovation, the progress is made within an established path (Christensen & Rosenbloom, 1995), moreover, it aims to sustain the rates of improvement (Christensen & Bower, 1996).

OD: Incremental innovations are going to be measured by the adjustments it brings to products and processes as well as for market, and organizational innovations, as an example, “small changes in the technology, design and/or fresh look, product relaunches, and line extensions that are new for the company but not new for the market” (Lennerts et al, 2020, p.2).

Radical Innovation

CD: Radical innovations are characterized as essential technological changes of a company. In general, radically innovative products are new to the company and it can also be new to the industry. Furthermore, these products offer significant and unexpected benefits to the customers (Lennerts et al, 2020).

OD: Radical innovations are going to be measured by Dahlin & Behrens (2005) standards of radicalness: “Criterion 1: The invention must be novel: it needs to be dissimilar from prior inventions. Criterion 2: The invention must be unique: it needs to be dissimilar from current inventions. Criterion 3: The invention must be adopted: it needs to influence the content of future inventions” (p.725).

4.2.1 Other Important Categories

Open Innovation

CD: “is a distributed innovation process based on purposely managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organization’s business model” (Chesbrough, 2019, p.30).

Corporate venturing

CD: “Corporate Venturing is the set of organizational systems, processes and practices that focus on creating businesses in existing or new fields, markets or industries - using internal and external means” (Narayanan et al, 2009, p.59).

Incumbents

CD: “those actors who wield disproportionate influence within a field and whose interests and views tend to be heavily reflected in the dominant organization of the strategic action field. Thus, the purposes of the field are shaped to their interests, the positions in the field are defined by their claims on the lion’s share of the resources in the field, the rules tend to favor them, and shared meanings tend to legitimate and support their privileged position within the field (Gamson, 1975, p.13).

Startups

CD: a temporary company created with the goal to search for a repeatable and scalable business model (Blank, 2010).

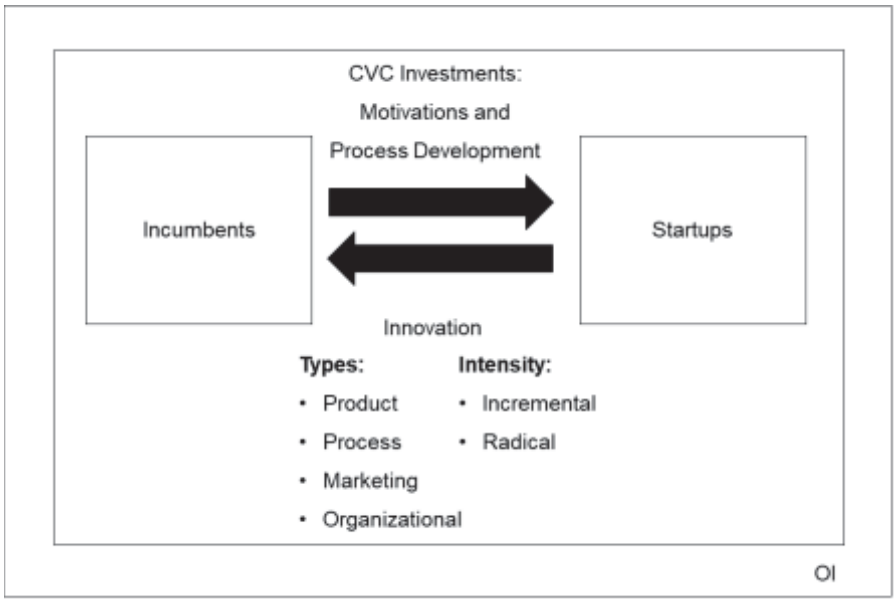
Startup Acceleration Program

CD: “Insource external innovation to stimulate and generate corporate innovation” (Chesbrough, 2019, p.114).

4.3 Research Design

In order to facilitate the comprehension of this dissertation, the graphic representation has been designed, as exhibited in the figure below.

Figure 6. Graphical representation of the research design



Note. Developed by the author (2020).

The figure above represents the major aspects analyzed in this dissertation. Incumbents interact with startups in different forms, being CVC one of them (Nayrayanan, 2009). There are several motivations for these companies to invest in technology-intensive entrepreneurial ventures one of them is the learning possibilities and the innovation opportunities (Lee, 2015) this relationship can bring. In addition, this process can or should happen based on some characteristics (motivations and process development), these actions are represented by the arrow from the incumbents to the startups.

Companies expect innovations as a counterpart of this interaction, which can be developed in different forms. These innovations can be classified in terms of types, product, process, market, and organizational innovation (Oslo Manual, 2018). As well as in terms of intensity, as incremental or radical innovation (Tidd & Bessant, 2018). These outcomes are represented by the arrow from the startups to the incumbents. Both parts, startups, and incumbents, can benefit from this interaction. This research is dedicated to understanding the innovation outcomes of this relationship from the point of view of the incumbents.

The following phases compose this dissertation, the first is preparatory; next is the investigative; the third is the data analysis, and the fourth the conclusion, as can be seen in detail in the subsequent table.

Table 6. Methodological procedures main phases

Preparation	● Chose the topic of research. ● Start the literature review. ● Defining the problem. ● Start the research and define the research objectives. ● Systematic literature review. ● Research method definition. ● Selection of units of analysis (companies), as well as of the interviewees. ● Elaboration of the semi-structured interview script. ● Validation of the semi-structured interview script;
Investigation	● Secondary data collection about the research topic. ● Data collection on the studied companies. ● Collection of primary data of studied companies. ● Interview transcription. ● Documental analysis of studied companies.
Analysis	● Content analysis of multiple case study material. ● Documental analysis of studied companies.
Conclusion	● Final remarks, study limitations and future research.

Note. Developed by the author (2020).

4.4 Research Classification

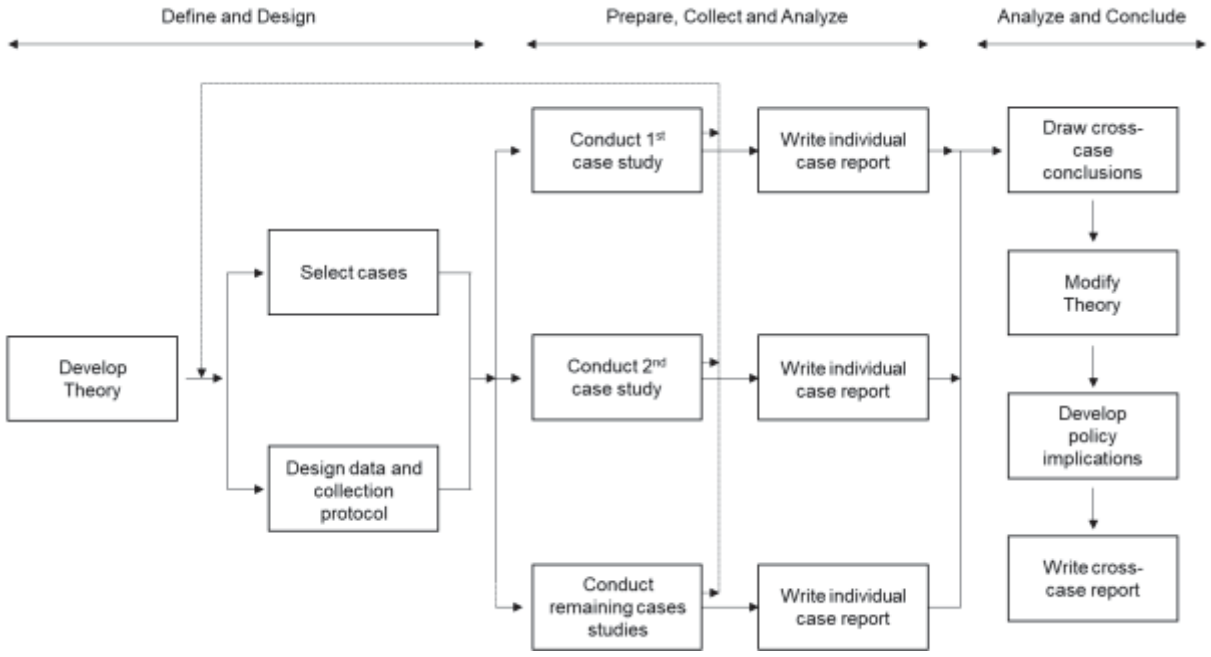
The most used research approaches in Social Sciences are the quantitative, qualitative, and mixed techniques (Chen, 1997). The pursuit to analyze a phenomenon in depth is a premise of qualitative research (Creswell & Creswell, 2018), being translated in this study as the objective to enhance the knowledge about CVC investments (motivations and development process) and the innovation outcomes (in terms of type and intensity) perceived by incumbents when applying this investment strategy. In order to uncover the nature of the phenomena described above, the descriptive research design was used. Descriptive research is characterized by a deep evaluation of characteristics that involve a given phenomenon (Saunders, Lewis &

Thornhill, 2009). This assumption has been met in this dissertation by the analysis of the CVC phenomenon, its motivations and process development, as well as the innovation outcomes perceived by incumbents when applying CVC investment.

Finally, there are different research procedures available for scholars, including the case study. According to Yin (2018), the case study is the method adopted by researchers when there is little control by the investigator over the events analyzed and when a contemporary phenomenon is under focus within the context of real life. For Yin (2018), the case study method can be defined as single case study or multiple case study.

For the purpose of this research, the multiple case study method has been chosen. More than one company has been selected to take part in the study; thus, by analyzing more than one organization it is possible to predict both similar and contrary results with predictable reasons to increase the external validity. The following figure shows the different steps of a multiple case study.

Figure 7. Steps of a multiple case study



Note. From Yin, 2018, p.94.

To use multiple case studies instead of one case alone, might be a way to reduce the vulnerability of the results and increase its academic vigor. In this research

individual cases serve as an evidence base for the analysis (Yin, 2018), being presented in summary form throughout each section, so that the entire report consists of the analysis between the cases.

Additionally, this study has been conducted within a cross-cut temporal treatment (Neuman, 2004; Saunders et al, 2009); thus, companies have been analyzed in a determined time frame.

4.5 Case Selection Criteria

The companies analyzed on this dissertation were chosen from a google search for companies that do CVC in Brazil, the search terms used were "Corporate Venture Capital", "Empresas que fazem Corporate Venture Capital no Brasil", and "Inovação Aberta e CVC no Brasil". The results have shown a number of companies applying CV activities in Brazil. The names of the companies have been gathered by the author and a first analysis on their website has been made in order to understand the type of OI activities performed by these companies. After this first analysis, each company has been contacted and those that gave the access to data were interviewed and analyzed.

In short, there were three specific steps to select the cases: i) the name of the company has appeared in the Google search; ii) positive result by the author's analysis on the company's website; iii) access to information given by the company through interviews. The interviews have been made with seven different companies, which agreed to disclose their information and contribute with this dissertation. The data gathered within the seven analyzed cases has reached theoretical saturation, when no additional data is needed to analyze a given phenomenon (Saunders et al., 2018). For this reason, no other company has been further investigated.

The interviewed companies are located in Brazil and have OI processes already implemented. Despite the fact that the analyzed companies are from different sectors, the OI strategies and the external collaboration process is similar in all cases. The companies have implemented Outside-in OI strategies in the form of Startup Acceleration Programs, and even those companies that have not yet invested in

external new ventures through CVC are in the process of establishing a CVC fund with the purpose of starting to invest in external new ventures.

For the reason exposed above, the companies have been divided into three different categories: i) Companies that have OI strategy, do not operate CVC investments, however, are in the process of establishing one; ii) Companies that invest in startups through M&A (Merge & Acquisition); iii) Companies that already had at least one investment in startup through CVC in Brazil or abroad. The following tables summarizes the interviewed companies.

Table 7. Analyzed cases

Section	**Company Description**	**OI strategy in place**
I) Companies that have OI strategy, do not operate CVC investments, however, are in the process of establishing one	A Brazilian multinational company leader in food production	An Outside-in OI process in the form of a Startup Acceleration Program is in place. Main focus of this program is on company's core activities. There is no CVC fund constituted, however the company has the goal to establish a CVC fund.
	The largest steel industry in Brazil and Latin America	An Outside-in OI program in the form of an innovation hub is in place. The CVC Fund is in the process of implementation with the goal to be a strategic vehicle to increase the scope of OI activities.
II) Companies that invest in startups through M&A	A Brazilian multinational specialized on computer consulting and advisory	Outside-in OI is applied by investing in new ventures through M&A. The invested companies continue to operate separately from the investing company.
III) Companies that already had at least one investment in startups through CVC in Brazil or abroad	A Japanese multinational company in the automotive sector.	An Outside-in OI strategy in the form of a Startup Acceleration Program is in place with the goal to solve internal challenges through innovation and external partners. CVC investments occur abroad, the company has a CVC investment fund in place with two other major players in the mobility sector.

	A Brazilian leader manufacturer of wood products, sanitary vitreous chinaware, and metal fittings	An Outside-in OI process focused on the interaction with the ecosystem, on the acceleration of scaleups, and on the internal development of new business. There has been an investment in one external startup. After establishing the Startup Acceleration Program, the company has matured the OI process and it is now rethinking its innovation strategy and is in the process of creating a CVC Fund.
	Brazilian manufacturer leader in pulp and paper production	An Outside-in OI process in the form of a Startup Acceleration Programs is in place. This program has the goal to connect with the startup ecosystem and improve innovation opportunities. CVC investments are performed inside and outside Brazil. Although the company already performs equity investments in external new ventures, there is no formal CVC Investment Fund created.
	Brazilian transnational conglomerate, manufacturer of commercial, executive, agricultural, and military aircraft, aerospace parts, services, and support	An Outside-in OI strategy through Startup Acceleration Programs and CVC investments in in place. The Startup Acceleration Programs are aimed to access external new ventures supporting the company to reach new technologies and innovations. CVC investments are performed by the company in Brazil and abroad with support of a CVC investment funds in Brazil in the US.

Note. Developed by the author (2020).

To increase the knowledge about the companies and interview conditions, the next table has been formulated with a compilation of information about the companies, interviewees and about the conditions under which the interviews have been made.

Table 8. Description of analyzed cases

Company Description	**Founded**	**Average number of Employees**	**Role of interviewees**	**Working time in the company**	**Duration minutes**	**Date and year**

A Brazilian multinational company leader in food production	1934	90 Thousand	Head of Open Innovation	1,8 years	27’	June 25th 2020
The largest steel industry in Brazil and Latin America	1941	20 Thousand	CVC Manager	1,7 years	24’	July 23rd 2020
A Brazilian multinational specialized on computer consulting and advisory	1987	20 Thousand	Head of Digital Strategy and Innovation	4,6 years	21’	July 1st 2020
A Japanese multinational company in the automotive sector.	1933	150 Thousand	OI Manager	Not mentioned	20 minutes	June 26th 2020
A Brazilian leader manufacturer of wood products, sanitary vitreous chinaware, and metal fittings	1961	10 Thousand	I) Head of Innovation II) Strategic Planning and Business Development Executive Manager	I) 1,4 years II) 1,9 years	37 minutes	July 17th 2020
Brazilian manufacturer leader in pulp and paper production	1924	30 Thousand	Head of Digital Transformation	6,3 years	45 minutes	July 1st 2020
Brazilian transnational conglomerate, manufacturer of commercial, executive, agricultural, and military aircraft,	1969	20 Thousand	I) Head of Corporate Venture Capital and II) Leader of Startup Ecosystem &	I) 18,8 years II) 5,6 years	46 minutes	I) July 9th 2020 II) June 25th 2020

aerospace parts, services, and support			Innovation Culture			

Note. Developed by the author (2020).

As stated above, the seven analyzed companies are multinationals with subsidiaries in Brazil with Outside-in OI processes in place. The companies have been established in different years; the oldest company has been founded in 1924 whereas the youngest in 1987. Even though the analyzed companies are from different sectors, the OI strategies are similar in all analyzed cases. The interviews with the companies placed in the last section, Companies that already had at least one investment in startup through CVC in Brazil or abroad, have been longer than the ones in the first two sections. The reason for that, is that the three companies positioned in the last section have already made at least one CVC investment and so they have been scrutinized in greater detail.

4.6 Data Collection Techniques

The selection of data sources used to answer a research question is an important research phase. Data can be obtained via documents, records, interviews, direct observation, or even through artifacts (Yin, 2018). The following table has a summary of different types of sources of evidence that can be used in a research and the strengths and weaknesses of each one.

Table 9. Six sources of evidence: Strengths and Weaknesses

Source	**Strengths**	**Weaknesses**
Documentation	Stable – can be reviewed repeatedly. Unobtrusive – not created as a result of the case study. Specific – can contain the exact names, references, and details of an event. Broad – can cover a long span of time, many events, and many settings.	Retrievability – can be difficult to find. Biased selectivity – if collection is incomplete. Reporting bias – reflects (unknown) bias of any given document's author. Access – may be deliberately withheld.

Archival records	(Same as those for documentation) Precise and usually quantitative.	(Same as those for documentation) Accessibility due to privacy reasons.
Interviews	Targeted – can focus directly on case study topics. Insightful – provides explanations as well as personal views (e.g., perceptions, attitudes, and meanings).	Bias due to poorly articulated questions. Response bias. Inaccuracies due to poor recall. Reflexivity – e.g., the interviewee says what the interviewer wants to hear.
Direct observation	Immediacy – covers actions in real time. Contextual – can cover the case's context.	Time consuming. Selectivity – broad coverage difficult without a team of observers Reflexivity – actions may proceed differently because participants know they are being observed. Cost – hours needed by human observers.
Participant observation	(Same as above for direct observation). Insightful into interpersonal behavior and motives.	(Same as above for direct observation).
Physical artifacts	Insightful into cultural features. Insightful into technical operations.	Selectivity. Availability.

Note. From Yin, 2018, p.157.

Although not all types of evidence are relevant to all the case studies, it is possible to observe that the sources complement each other (Yin, 2018). For the development of this work, sources of evidence from semi-structured interviews and information available on companies' websites have been analyzed.

The semi-structured interviews were made following the research purpose and based on the literature of OI and CVC. Although semi-structured interviews have a pre-developed script, the researcher might introduce or eliminate questions according to the interview's performance (Bertucci, 2009). The Case Study Protocol as well as the Interview Script can be verified in the Appendix II and in the Appendix III of this dissertation.

In this research, managers of companies that apply OI strategies and/or CVC investments have been interviewed. The interviews enhanced the knowledge about OI

strategies and the CVC investments (their motivations and their development process) and about the perceived innovations (in terms of type and intensity) derived from this process. In order to have a deeper understanding of the innovation process, when needed, more than one person in the company has been interviewed. The interviews have been recorded, transcribed, and analyzed, additionally, the companies' websites have been evaluated.

Data has been further obtained by the evaluation of different materials (Godoy, 1995). Social networks and websites were examined, assuring that more than one source of evidence is used in this study (Flick, 2018). In the next section the data analysis has been described.

In summary, the data used for the case analysis were extracted from the interviews carried out and from the analysis of the websites of the interviewed companies.

4.7 Data Analysis

A content analysis strategy has been applied. After collecting data from interviews, it is necessary to perform an analysis to organize and categorize the information. According to Creswell & Creswell (2018), the steps are the following: i) organization and data preparation - transcription of the interviews and separation of the documents; ii) data analysis and codification. The purpose of content analysis in this study is to identify from in the interviewees' statements as well as from companies' website analysis, how CVC investments influence innovations of incumbents with subsidiaries in Brazil.

As stated by Eisenhardt (1989) a way of analyzing existing interactions among cases is to "select categories or dimensions, and then to look for within-group similarities coupled with intergroup differences" (p.540). The categories or dimensions used were the motivations for implementing CVC investments as well as the description of this process in incumbents with subsidiaries in Brazil. Followed by perceived innovations in terms of type - product, process, market, and organizational -, as well as of intensity - incremental, and radical by the analyzed companies.

Following Eisenhardt (1989), in this research the cases have been first analyzed individually, and then by a cross-case analysis in order to discover patterns. The table below represents a methodological summary of this dissertation.

Table 10. Methodological Summary

Research title	Perceived innovation in CVC investments: the case of incumbents with subsidiaries in Brazil.
Research problem	How do incumbents with subsidiaries in Brazil perceive innovation from CVC investments?
General objective	Understand how incumbents with subsidiaries in Brazil perceive innovation from CVC investments.
Specific objectives	Describe the motivations for CVC investments by incumbents with subsidiaries in Brazil. Describe the process development of CVC investments in incumbents with subsidiaries in Brazil. Identify the innovations by type (product, process, market, and organizational) perceived by incumbents with subsidiaries in Brazil in CVC investments. Identify the innovations by intensity (incremental and radical) perceived by incumbents with subsidiaries in Brazil in CVC investments.
Research Approach	Qualitative research
Nature of Research	Descriptive
Research Procedure	Multiple Case Study
Object of study	Incumbents that perform OI activities and CVC investments in Brazil.
Data collection technique	Semi-structured interviews and documents.
Data analysis technique	Individual case analysis followed by cross-case analysis
Time dimension	Cross-cut temporal study.

Note. Developed by the author (2020).

4.8 Reliability and Validity

For Yin (2018), the quality of most empirical social research can be assured in four ways, which can also be applied when using the case study approach: i) construct validity; ii) internal validity; iii) external validity; iv) reliability. The following table has a

detailed explanation of each test used in multiple case studies adapted to the technics used in this dissertation.

Table 11. Case study tactics

Tests	**Case study tactic used in this dissertation**	**Phase of case study research in which tactic is addressed**
Construct Validity	● multiple sources of evidence: interviews and information available on companies' websites have been used.	data collection
Internal Validity	● pattern matching. ● explanation building.	data analysis
External Validity	● case study protocol	research design
Reliability	● develop a case study database. ● maintain a chain of evidence.	data collection

Note. Adapted from Yin, 2018, p.79.

The construct validity is related to the operational measures consistent with the research. To ensure construct validity, different sources of evidence should be used in a logical sequence, in addition to consulting the review of key informants on the results found (Yin, 2018). Thus, for the purpose of this study the data triangulation is going to be obtained from the evaluation of different units of analysis in different data sources (interviews and websites).

The second validity, the internal validity, "this test has been given the greatest attention in experimental and quasi-experimental research" (Yin, 2018, p.80). In this sense, adapting the quantitative concept to qualitative research, internal validity would be to determine whether a research actually measures what the researcher intends to measure, whether the methodological processes are coherent and consistent, and whether the research results are reliable. The third validity, the external validity, is sought to provide the generalization of the results obtained (Yin, 2018).

Reliability concerns the possibility to replicate the study; a tool that enables the results replication is the case study protocol (Yin, 2018). Thus, it reduces the chances

of errors and biases of the study. For the purpose of this study, the case study protocol is going to be used, a detailed explanation can be found in Appendix III.

4.9 Mooring Matrix

The following table has a summary of the methodological procedures of this study, in which the specific objectives and questions of the data collection instrument are presented. This Mooring Matrix offers an overview of the research configuration, which enables a better understanding of the different research phases for the researcher as well as for third parties (Telles, 2001).

Table 12. Graphical representation of the methodological phases

Specific Objectives	**Theoretical Reference**	**Authors**	**Questions**
Describe the motivations for CVC investments by incumbents with subsidiaries in Brazil.	OI, Outbound OI, VC, and CVC.	Chesbrough (2019); Usman & Vanhaverbeke, (2017); Dahlander & Gann (2010); Gassmann and Enkel (2005); Battistini et al, (2013)	Does the company apply OI, the innovation flows across organizational boundaries? What are the types of OI strategies applied by the company: Outbound, Inbound or Coupled? Is the motivation to apply CVC strategic, with focus on option generation and acceleration of innovation, financial aiming at diversification and financial return, or balanced with focus on both strategic and financial returns? Is there independence between the investor and investee? Is the investment counterpart a minority equity share?
Describe the process development of CVC investments in incumbents with subsidiaries in Brazil.	OI, Outbound OI, Startup Acceleration Programs, and CVC.	Chesbrough (2014)	How did the development process of CVC investments take place? Has the company started the OI strategy with a Startup Acceleration Program - complementary external innovation to push an existing corporate innovation, before

			implementing CVC investments - the participation in the success of external innovation and gain strategic insights into non-core markets.
Identify the innovations by type (product, process, market, and organizational) perceived by incumbents with subsidiaries in Brazil in CVC investments.	OI Innovation by type (product, process, market and organizational), VC, and CVC.	Oslo Manual (2018); Reichstein & Salter, (2006); Tidd & Bessant (2018); Gaut (2018).	Identify and describe perceived product, process, market, and organizational innovations in CV investments.
Identify the innovations by intensity (incremental and radical) perceived by incumbents with subsidiaries in Brazil in CVC investments.	OI Innovation by intensity (incremental and/or radical) VC, and CVC.	Lennerts et al, 2020	Identify and describe perceived radical incremental innovations in CVC investments.

Note. Developed by the author (2020)

4.10 Research Method Limitation

The limitations of a study are related to the delimitations of the chosen method. Thus, the present research has limitations associated with the restrictions of qualitative research and the case study. In addition, in this particular research, another issue can be pointed out. The phenomenon studied could be better observed in a longer time period, pondering the time for innovations to take place. As there is a time limit for conducting this research, it was not possible to apply a longitudinal data collection that allows a long-term study. The long-term return nature of innovation calls for research considering companies that have been applying CVC investments for a longer time.

5. CASE DESCRIPTION

The interviews were made within seven different incumbents with subsidiaries in Brazil, which have OI processes already implemented. These companies are divided into three different categories: i) Companies that have OI strategy, do not operate CVC investments, however, are in the process of establishing one; ii) Companies that invest in startups through M&A (Merge & Acquisition); iii) Companies that already had at least one investment in startup through CVC in Brazil or abroad. No company names were disclosed as a way to keep the confidentiality of their information.

I) Companies that have OI strategy, do not operate CVC investments, however, are in the process of establishing one.

Case 1: A Brazilian multinational company leader in food production.
Role of the interviewee in the company: Head of Open Innovation
Number of employees: more than 500 employees.

According to the interviewee, the type of OI strategy applied by the company is the Outside-in OI. The OI area is responsible to establish the contact and relationship with the innovation ecosystem - startups, scaleups, and groups of researchers. There is also a specific approach towards universities. “The main goal of this process is to increase the contact with the academy, understand what is being researched and how it can connect with the company in different ways, how the company can support the research initiatives as well as how they can benefit from it” (Interviewee).

The first OI initiative started in 2016. However, according to the interviewee there were no specific rules or processes, and the innovation mindset was not yet established in the company and among its employees. When the company implemented the OI strategy, the major way to connect with startups was reactive, this means, startups would offer products and services to the company. This has been replaced by a structured approach towards the external ecosystem. Currently, the approach towards startups can be reactive, as well as active.

Both approaches are equally important, however through the active method the company focused on understanding major internal problems that can be solved by external partners, throughout startups challenges. The company has established an innovation hub with the objective to accelerate the development of new business by launching challenges to be solved by the innovation ecosystem. According to the hub's website, the objective of it is to generate impactful businesses. "We communicate with different areas of the company to understand what the main problems are, and if there is a lack of technology which the R&D is unable to meet" (Interviewee). From these challenges the company selects the startups that bring the best solutions. Additionally, each new venture shows the cost to operate the solution and the company decides whether to pay to do a pilot. The active methodology leverages the company's innovation culture and mindset, while it enables a greater connection with the ecosystem.

If the solution is validated, the company analyses whether to continue working with the startup. Either the company can purchase, invest, or transform the startup into an exclusive supplier. However, as the OI area is new, the company has not yet used the investment option. "There is no CVC area yet, in 2020 the company should start to set up a CVC fund" (Interviewee).

By analyzing the company's types of innovations, the majority are product innovations. However, product innovations are developed by the internal R&D, which is not the focus of the challenges described above. The OI approach is focused on the processes related to the core activities of the company. "For example, developing Human Resources solutions is not considered a high priority. The innovation area is prioritizing solutions regarding quality, agribusiness, commodities, and grains, specifically" (Interviewee).

The innovation challenges are focused on incremental innovations, especially process improvements to the Brazilian operation as well as to the subsidiaries abroad. According to the interviewee there have been cases of product improvements and radical innovations, however, still on a small scale.

In order to launch challenges, the company implemented a strong internal as well as external communication. "The main idea was to search for external partners to solve internal problems" (Interviewee). These changes in the communication process

characterized market innovation; thus, the company has changed the way they positioned themselves toward innovation internally as well as externally.

The OI area plays an especially important role in terms of implementing an innovation culture inside the company. “We started to bring this culture of innovation to different areas. For example, we hold a weekly meeting with areas such as IT, Engineering, Marketing, to talk about what the OI area is doing and to connect them with the external ecosystem by bringing startups into their daily activities” (Interviewee).

In a nutshell, the company has an established Outbound OI process focused on the core activities of the company by active and reactive contact with external new ventures. Currently, the company has an innovation hub in place, by which it launches challenges to be solved through external counterparts. There is no CVC fund constituted, however the company has the goal to establish a CVC fund. Startup Acceleration Program is in place and is focused on incremental and radical innovation, as well as at organizational innovation and process innovation. Product innovation still on a small scale.

Case 2: The largest steel industry in Brazil and Latin America.

Role of the interviewee in the company: CVC Manager

Number of employees: more than 500 employees.

The company has an Outside-in OI process in place by which the company approaches startups and other actors of the innovation ecosystem. The CVC fund is not yet established; however, the company is initiating it as a way to complement the OI activities. “Basically, we started to interact with startups and partner with the ecosystem to streamline our new business development process. However, to work with startups is not simple, it is necessary to structure internal processes, and the mindset so the partnership is able to work. We have been through a learning cycle by working together with external ventures" (Interviewee).

According to the interviewee, the first phase of the OI process was to hire and co-create products with startups, external research centers, and universities, that the internal areas were unable to develop. In order to make this interaction possible, the

company has launched an innovation program, an innovation hub. According to the company's innovation hub website, the objective is to position the company strategically and actively in the innovation ecosystem through innovation challenges. By mapping internal challenges and leading the OI process alongside with external actors to search for innovative solutions as well as to co-create solutions. "The OI process complemented internal R&D efforts, which focused mainly on product improvement; however, upgrading the product does not necessarily lead to improvements in the business model, neither does it increase a customer centric view. So, while we concentrate our efforts on product development, quality, and technical specifications the startups complement it" (Interviewee).

These partnerships have opened the innovation process, supported the company to acquire new competencies, and to foster a customer centric approach. Working with startups has proven to be particularly challenging for the company, as they bring agility and new skills that have questioned the status quo. CVC can help with the process of changing the mindset, as workflows will change. "We have to adjust our processes, be more agile, and to structure back-office work to perform CVC operations" (Interviewee).

The OI area has undergone a maturation period of 1.5 years. After this phase, the company decided to move forward and establish a CVC Investment Fund. Currently, the company is in the process of forming its first fund, and it is analyzing two startups for future investment. According to the company's innovation program website, the CVC fund is an investment vehicle aimed at creating innovative solutions for the Industry 4.0 in addition to disruptive solutions, and access to new markets.

The CVC is going to be a strategic and not a financial vehicle. The investments in new ventures should add speed to the R&D process and facilitate company's access to innovation and technological trends. "This is one of the biggest challenges, because the operational and the financial aspect of investments must be aligned. If the CVC fund seeks only financial return, it would be easier. However, aligning the financial return with operational objectives is a challenge" (Interviewee).

The investment thesis is in both incremental and radical innovations and involves both products and processes,"80% investments are in the core business, and 20% in new business" (Interviewee). The CVC vehicle is divided into core investment

thesis: i) strategic: synergic businesses (Industry 4.0, Renewable Energies, Carbon Free, Fintech's, Circular Economy) and ii) New market investments, which helps the company to access unknown markets.

To summarize, CVC is going to be implemented, as a strategic vehicle, in order to increase the scope of OI activities. The company already has an Outbound OI program, an innovation hub, and is working not only with external new ventures, but also with universities and research centers as a form to support R&D activities and increase the company's access to new technologies and innovations. The CVC Fund is in the process of implementation, currently the company is analyzing two startups for future investments. The main objective of the CVC fund is to invest in incremental and disruptive innovations, involving both products and processes. In order to conduct the work and to invest in startups, the company has changed organizational aspects by innovating, and improving internal processes and cultural aspects.

II) Companies that invest in startups through M&A.

Case 3: A Brazilian multinational specialized on computer consulting and advisory.

Role of the interviewee in the company: Head of Digital Strategy and Innovation
Number of employees: more than 500 employees.

The company has an Outside-in OI process established through a M&A strategy. The company does not work with investment in exchange of equity, which would be the case of CVC investments. "All 18 Ventures that are part of the company's portfolio were major purchases, however, most of the new ventures acquired by the company, continue to operate freely, separately from the investing company" (Interviewee).

The fact that the invested startups continue to operate separately from the investing company approximate the investment strategy to a CVC. "The way we work with M&A is different than the usual. If you consider CVC the investment in a company that keeps running its activities freely, separately from the investing company, then we do CVC. The objective of investments in M&A is for us to innovate and break the status

quo” (Interviewee). Within the M&A strategy the company aims at organizational innovation, towards a leaner and more agile work methods. Additionally, when making acquisitions, the focus is on incremental and disruptive innovations, both in products and processes.

According to the company’s website, the company works alongside an ecosystem of ventures and startups, in areas such as automation, cloud, internet of things (IoT), and User Experience (UX). On its website, the company has listed eleven startups that have been either developed internally by the company, or in partnership with external new ventures in Brazil and abroad, as well as major acquisitions that the company has made following the M&A model described above.

To sum up, the company’s Outside-in OI is applied by investing in new ventures through M&A. The invested companies continue to operate separately from the investing company, which is considered by the interviewee a form of CVC investment. The M&A strategy allows the company to innovate by acquiring a new venture and absorb its culture, the way of work, and supporting organizational innovation. “The first thing we look for is a change in the culture, and all purchases contribute to the company's cultural and mindset change. Thus, an entrepreneurial culture enters the company. Innovations in the way of work, that is, new processes, working methods, add knowledge are possible gains from this connection” (Interviewee). Furthermore, the company focuses on organizational innovation, towards a leaner and agile work methods. Additionally, the focus is on incremental and disruptive innovations, both in products and processes.

III) Companies that already had at least one investment in startups through CVC in Brazil or abroad.

Case 4: A Japanese multinational company in the automotive sector.

Role of the interviewee in the company: Brazil’s OI Manager

Number of employees: more than 500 thousand employees around the globe.

According to the Interviewee, the type of OI strategy applied by the company is the Outside-in OI. The company has an innovation program established, focused on

solving problems in partnership with the innovation ecosystem. Although CVC investments are already made in other subsidiaries of the company in regions such as Europe, North America, and Asia it has not been implemented in Brazil.

In Brazil, the process of working with startups involves, first the identification of internal problems that need to be solved, second the Outside-in OI approach is implemented by analyzing outside the company's borders to solutions available in the market. The objective of the collaboration with startups involves organizational and process innovation. "Usually, the startup develops a process innovation for us or does a parameterization or adaptation of a solution we already have" (Interviewee).

The company's OI program website states that the initiative has the major goal to promote a collaborative environment to solve real problems not only from inside the company, but also from the region through innovation. The main areas the program is focused are: Mobility, Health, and Environment. The OI project is concentrated on promoting innovation and the development of new business inside and outside the company.

The interviewee has described that in Brazil the OI approach is related to incremental organizational and process innovations. The company searches for external partners that can support them to solve internal problems using technologies already available in the market, instead of developing them internally. There has not been evidence of the OI approach being applied in product innovation by the company. It was possible to infer the organizational innovation within the OI process; thus, in order to partner with external startups there has been an adaptation on internal processes, additionally this type of partnership demands important cultural changes.

In Brazil, there is no CVC strategy in place. "CVC investments have not been made by the company in Brazil yet. Although some disruptive innovations have been developed here, for example, car-sharing initiatives, these types of investments in market innovation would have the potential to alter the company's business model, however, the company was unable to invest on them as the startups were still in an early stage" (Interviewee).

The company has a global CVC approach implemented in France, Silicon Valley, Israel, and China with the objective to accelerate and develop new technologies in product development. It has been described during the interview that the objective

of CVC investments is strategic and not financial. “The investments are always looking for future competitive factors and not necessarily on financial returns on investments, at least, not in the short term” (Interviewee).

The CVC fund website reveals that the investment in new external ventures is made by an alliance among three major players in the automotive sector, as stated in the website, this is the largest automotive alliance worldwide. The investment focus of the CVC Investment Fund is in the mobility sector, specifically: new mobility, autonomous driving, connected services, EV & Energy, Enterprise 2.0. Currently, the investment portfolio consists of nine startups on different areas of mobility. “The company’s CVC strategy outside Brazil follows a specific investment thesis of radical product innovation in autonomous and connected cars, clean energy, and other technologies that supports the creation of the vehicle of the future. The new solutions should aim to improve vehicles’ connectivity, increase efficiency etc. Additionally, the CVC investments should pursue innovations that leverage company’s competitive possibilities in the future” (Interviewee).

From this case on, a summary table has been made with the data and observations on each case and its CVC investments which is finalized by a summary table with all the cases researched in this dissertation.

Table 13. Constructs and responses: Case 4

Constructs	Responses
Type of OI strategy	Outside-in OI
Startup Acceleration Program	Yes, focused on incremental organizational and process innovation
CVC Investments	CVC fund outside Brazil focused on radical product innovation
Objective of company’s CVC investments	Strategic Investments
Perceived innovations by type on CVC investments in Brazil	Organizational Innovation
Perceived innovations by type on CVC investments outside Brazil	Product and Market Innovation

Perceived Innovation by Intensity on CVC investments in Brazil	Not perceived
Perceived Innovation by Intensity on CVC investments outside Brazil	Radical Innovation

Note: Developed by the author (2020).

In a nutshell, the OI strategy of the company's subsidiary in Brazil is focused on a Startup Acceleration Program aimed at solving internal challenges through innovation and external partners. Internationally, the company has merged with two other major players in the mobility sector to invest in radical innovations. The investments made by the company internationally still had effects in terms of perceived organizational innovation in Brazil. Most of the investments made by the CVC fund are in radical innovations, which have the potential to disrupt the entire industry and have a long-term return on investment. For this reason, the Brazilian subsidiary has not perceived differences in terms of types of innovation: product, process, and market innovation, as well as in terms of innovation intensity: incremental and radical innovation.

Case 5: A Brazilian leader manufacturer of wood products, sanitary vitreous chinaware, and metal fittings.

Role of the interviewee in the company:
Interviewee 1: Head of Innovation
Interviewee 2: Strategic Planning and Business Development Executive Manager
Number of employees: more than 500 employees.

The company has established an innovation area, responsible for planning and executing innovation strategies. "As the leaders in our segment, we must look ahead of others; thus, inevitably we are going to be copied. Therefore, innovation is a crucial process for us" (Interviewee 2).

An investment on a startup has already been done by the company, however, at the moment, there is no CVC process established. Instead, the company works with startups via Outside-in OI, more specifically, through an acceleration program focused on scaleups. "We take this program very seriously; we spend time and effort to choose the companies" (Interviewee 1). According to the company's innovation program

website, the program has made more than fifty partnerships with startups. The program consists not only in the connection with the ecosystem, and in the acceleration of external scaleups, but also in the internal creation of new business as a way to foster the cultural aspect of innovation among its employees.

The investment made in a startup has supported the company on its learning curve, notably, organizational innovation, and in the process of becoming more innovative. “I would say that the investment was a painful experience for the company. I think that the biggest benefit we got from it was to learn that we were not prepared for it” (Interviewee 1). As stated during the interview, there have been important reality shocks when the company invested in the startup. First, regarding the speed of action, between the company and the invested venture. “It is almost shocking the speed difference that exists between an established company, and the agility of a startup” (Interviewee 1). Second, the company’s level of governance, and bureaucracy hampered the development of the project. “We envisioned benefits when designing the investment thesis different from what we have actually had, however, I think it was worth it” (Interviewee 1).

The company has not made another investment after the first one, that is, that is no CVC fund or strategy in place. However, as mentioned during the interview, the company is rethinking its innovation strategy and is in the process of establishing a CVC Investment Fund. The objective of the CVC Investment Fund is to participate in exponential growth not only via partnerships, but also via equity. The company’s goal for CVC is not to be purely financial, but mainly strategic, as a way to change its innovation mindset. Additionally, the three main objectives behind the CVC Fund are: i) mindset and cultural shift; ii) financial returns; and iii) process innovation. “These are the three pillars of our CVC strategy: innovation and financial returns, as well as mindset, and culture change” (Interviewee 2).

The company already invests in product innovation internally, for this reason, they do not foresee the CVC as a vehicle to increase product innovation. The major focus is on organizational innovation, represented by cultural and innovation mindset change. “We do not want to look outside at the number of companies bringing the most diverse solutions and be a spectator. We want to lead the innovation process in our segment” (Interviewee 1). According to the interviewees, the company is a consolidator

of different businesses with no centralized innovation area. In their opinion, the CVC Investment Fund would be the Corporate Innovation area bringing innovation initiatives together in a new organizational format centered on innovation.

Another important aspect brought during the interview, is that the CVC Fund is expected to enhance process innovation. “Currently, we focus on the core business, in our performance, and product development. However, we could innovate further, in processes, structure and in the business model, reaching the product and consequently the consumer” (Interviewee 2).

Regarding the intensity of innovation expected from this process. The interviewee mentioned that they are focusing the innovation process on incremental as well as radical innovation. “When we look at our history, we have developed all kinds of innovations, we already had innovations focused on technologies out of our core business, as well as within our main expertise. Our role in the OI area is to look to different types of innovations” (Interviewee 2).

Table 14. Constructs and responses: Case 5

Constructs	Responses
Type of OI strategy	Outside-in OI
Startup Acceleration Program	Yes, aim at incremental and radical, as well as organizational and process innovation
CVC Investments	One investment, no CVC Fund in place
Objective of company’s CVC investments	Strategic and Financial
Perceived innovations by type on CVC investments in Brazil	Organizational Innovation
Perceived innovations by type on CVC investments outside Brazil	Not mentioned
Perceived Innovation by Intensity on CVC investments in Brazil	Incremental and Radical Innovation
Perceived Innovation by Intensity on CVC investments outside Brazil	Not mentioned

Note: Developed by the author (2020).

In short, the company has an Outside-in OI process focused on the interaction with the ecosystem, on the acceleration of scaleups, and on the internal development of new business. There has been an investment in one external startup. Although the company learned from this experience, the result was not what has been expected, and no further investments were made. After establishing the Startup Acceleration Program, the company has matured the OI process and it is now rethinking its innovation strategy and is in the process of creating a CVC Fund. The fund should enhance the innovation process, alongside three main objectives: i) mindset and cultural change; ii) financial returns; and iii) process innovation. The company already invests in product innovation and it does not foresee CVC as a vehicle to increase product innovation.

Case 6: Brazilian manufacturer leader in pulp and paper production.
Role of the interviewee in the company: Head of Digital Transformation
Number of employees: more than 500 employees.

The company has an Outside-in OI strategy established and dedicated to search for new opportunities and new businesses. According to the interviewee, there is a CVC process for investing in new ventures, in which the company analyzes potential long-term disruptive technologies, inside and outside Brazil, in countries like Finland, USA, and Israel. Although the company does CVC investments, there is no structured CVC Fund.

These startups receive investments to develop long-term disruptive technologies. In addition to monetary investments, the company is part of the advisory board of the invested startups to accelerate their development. “These investments are strategic, in new ventures that have the potential to deepen and develop disruptive innovations. In quantity, they are still few, less than 10, but in relevance they can change the scenario of the global market” (Interviewee).

Besides CVC investments, the company has another OI initiative, a Startup Acceleration Program, which aims at improving the company's productivity. The company uses this process to connect with the startup ecosystem and to enhance

innovation opportunities, especially regarding incremental and process innovations, which can foster productivity improvements.

Generally, Proof of Concepts (POCs) is the strategy used to interact with startups. In this case, there is no intention to invest or acquire the startup. To carry out this strategy, the company has gone through a process of mindset transformation. “When we close the contract, the startup is already used to the company’s internal system, the contract is quickly signed, we have developed flexible payment terms so that the startup can start working with us quickly” (Interviewee).

The process of mindset and cultural shift, that is, the organizational innovation has been translated by the interviewee as secondary innovation. “Sometimes we focus on product innovation, but we end up changing processes, business models, governance aspects. This means, our processes end up moving forward” (Interviewee).

In summary, there are two OI strategies: i) Long term and strategic CVC investments in few startups located in Brazil and abroad. These investments are strategic, and they aim at radical innovations. ii) Startup Acceleration Program, which is aimed at incremental innovations focused on processes improvements. For the Startup Acceleration Program, the company searches for startups in the field of Artificial Intelligence, Predictive Maintenance, Visual Automation, and other technologies that support the company to solve internal problems.

Table 15. Constructs and responses: Case 6

Constructs	Responses
Type of OI strategy	Outside-in OI
Startup Acceleration Program	Yes, aimed at incremental innovation, as well as at organizational and process innovation
CVC Investments	Yes, in Brazil and abroad aimed at radical product innovation
Objective of company’s CVC investments	Strategic Investments
Perceived innovations by type on CVC investments in Brazil	Organizational and Product Innovation

Perceived innovations by type on CVC investments outside Brazil	Product Innovation
Perceived Innovation by Intensity on CVC investments in Brazil	Radical Innovation
Perceived Innovation by Intensity on CVC investments outside Brazil	Radical Innovation

Note: Developed by the author (2020).

The company has established Startup Acceleration Programs to connect with the startup ecosystem and improve innovation opportunities, especially regarding incremental and process innovations. The result of such programs are POCs that enable the company to interact with startups and with the ecosystem, without investing or acquiring them. To maintain a leading role or respond to technological changes, the company invests in startups through CVC inside and outside Brazil. Although the company already performs equity investments in external new ventures, there is no formal CVC Investment Fund created.

Case 7: Brazilian transnational conglomerate, manufacturer of commercial, executive, agricultural, and military aircraft, aerospace parts, services, and support.

Role of the interviewee in the company:
Interviewee 2: Head of Corporate Venture Capital
Interviewee 2: Startup Ecosystem Leader & Innovation Culture
Number of employees: more than 500 employees.

The company started the OI process in 1995, through Outside-in OI, by working with external companies and by structuring partnerships with universities. In recent years, the company has developed a greater interaction with startups, toward Startup Acceleration Programs and CVC Investments.

According to the company's Startup Accelerator Program website, the main objective of this initiative is to develop new business alongside with startups to reach unknown technologies. In terms of types of innovations, this program goal is to foster organizational, process and product innovations. Regarding the intensity of innovations, within this initiative the company is willing to boost incremental and radical

innovations. The company does not invest in the selected startups in the program but hire them. The process consists of the submission of proposals by external new ventures, the company evaluates them, develops a pilot to better understand the product and if approved, the startup can be hired.

In order to maintain a leading role or respond to technological changes, companies are starting investments through CVC. “Companies cannot solve the problems of product, service innovation, or even launch a new business model only through internal R&D or M&A. There is a strong disruption movement led by startups, CVC gives greater access to these companies that are at the forefront of technological disruptions. Instead of being a victim, they participate in the innovation process, investing in the most promising startups. Usually the investment strategy covers technology, product, service, and business model, in addition to discovering suppliers and partners of innovative solutions in the production chain” (Interviewee 1).

The company’s CVC area was created in 2012, together with intrapreneurial projects. There are four investment funds: two in the USA and two in Brazil. They have already made investments in startups in Brazil and in the USA. “The majority of CVC investments performed by us are focused on product technologies, new business models, new products, services, or businesses, both incremental, and disruptive innovations. There are some CVC investments that may end up generating new business models; however, for process improvement, the company has a specific Startup Acceleration Program” mentioned above (Interviewee 2).

The focus of CVC investments is strategic. “CVC's focus is always strategic; it does not make any sense as an investment. There are better investment products for a corporation than CVC, so investing in CVC for financial return does not make sense” (Interviewee 1). Within every CVC investment there is a value capture strategy, for each startup that enters the CVC the company aims to capture the maximum investment value, not necessarily financial returns, but surely strategic. “An example is an investment in a startup focused on autonomous vehicles. We are investing in this company, as we understand that this is an especially important technology for our industry, in addition, this technology is aligned with the company's strategy” (Interviewee 2).

As stated by the interviewees, the company has an international entity focused on innovation, with offices around the globe, as available on its website, the main goal of this initiative is to invest in radical innovations, related to autonomy, and urban mobility. Additionally, the interviewees have mentioned the creation of a CVC Investment Fund, a consortium of investors in Brazil. This fund is formed by the company and national governmental institutions, focused on investing in disruptive technologies. By analyzing the consortium website, it was possible to identify that the fund has invested in eight external new ventures in three main areas: aeronautical and space technology, defense, and security.

It has become clear during the interviews that the company has a participation in a VC Investment Fund in the United States. According to them, the investments the company makes abroad are through this VC, which has the objective to invest in automation, robotics, artificial intelligence, and Internet of Things (IoT) technologies.

Table 16. Constructs and responses: Case 7

Constructs	Responses
Type of OI strategy	Outside-in OI
Startup Acceleration Program	Yes, aimed at incremental and radical, as well as at organizational, market, and process innovation.
CVC Investments	Yes, in Brazil and abroad aimed at incremental and radical product innovation
Objective of company's CVC investments	Strategic Investments
Perceived innovations by type on CVC investments in Brazil	Product, process, market, and organizational innovations
Perceived innovations by type on CVC investments outside Brazil	Product, process, market, and organizational innovations
Perceived Innovation by Intensity on CVC investments in Brazil	Incremental and Radical Innovation
Perceived Innovation by Intensity on CVC investments outside Brazil	Incremental and Radical Innovation

Note: Developed by the author (2020).

The OI strategy of the company dates to the early 90's, when it started to work together with universities and external companies. Currently, the OI strategy has evolved towards a greater interaction with startups through Startup Acceleration Programs and CVC investments. Through Startup Acceleration Programs the company has access to external new ventures that support them to reach new technologies and innovations unknown by the company. To maintain a leading role or respond to technological disruptions, the company has established a CVC area in 2012, with a strategic focus. Since then, the company has created an investment fund in Brazil aimed at three main areas: aeronautical and space technology, defense, and security. Additionally, the firm has a participation in a VC fund in the US, which has the objective to invest in automation, robotics, artificial intelligence, and Internet of Things (IoT) technologies.

As a way of organizing the information, a table has been made compiling the main data obtained during the data collection phase. The following table contains the summary of all analyzed cases.

Table 17. Constructs and responses: Summary

	Companies that have OI strategy, do not operate CVC investments, however, are in the process of establishing one		Companies that invest in startups through M&A	Companies that already had at least one investment in startup through CVC in Brazil or abroad			
Constructs	**Case 1**	**Case 2**	**Case 3**	**Case 4**	**Case 5**	**Case 6**	**Case 7**
OI strategy	Outside-in OI	Outside-in OI	Outside-in OI	Outside-in OI	Outside-in OI	Outside-in OI	Outside-in OI
Startup Acceleration Program	Yes, aimed at incremental and radical innovation, as well as at organizational, product and process innovation however, still on a small scale	Yes, aimed at incremental and radical innovation, as well as at organizational, product and process innovation	Yes, aimed at incremental and radical innovation, as well as at organizational, product and process innovation	Yes, focused on incremental organizational and process innovation	Yes, aim at incremental and radical innovation, as well as at organizational and process innovation	Yes, aimed at incremental innovation, as well as at organizational and process innovation	Yes, aimed at incremental and radical innovation, as well as at organizational, product, and process innovation
CVC Investment	No CVC fund in place yet, but it is in the process of development. Antes será necessária uma inovação organizacional	No CVC fund in place yet, but it is in the process of development as a way to complement the OI activities	M&A strategy instead of CVC, but as invested startups continue to operate separately, it makes this the M&A strategy closer to a CVC	CVC fund outside Brazil focused on radical product innovation	One investment, no CVC Fund in place	Yes, in Brazil and abroad aimed at radical product innovation	Yes, in Brazil and abroad aimed at incremental and radical product innovation

CVC investment objective	When established, would aim at strategic investments	When established, would aim at strategic investments	M&A aim at strategic investments	Strategic Investments	Strategic and Financial	Strategic Investments	Strategic Investments
Perceived innovations by type, in Brazil	Not mentioned	When established, would aim at product and process innovation	Organizational, process and product innovation	Organizational Innovation	Organizational and Process Innovation	Organizational and Product Innovation	Product, process, market, and organizational innovations
Perceived innovations by type, abroad	Not mentioned	Not mentioned	Not mentioned	Product and Market Innovation	Not mentioned	Product Innovation	Product, process, market, and organizational innovations
Perceived Innovation by Intensity, in Brazil	Not mentioned	When established, would aim at incremental and radical innovation	Incremental and Radical Innovation	Not perceived	Incremental and Radical Innovation	Radical Innovation	Incremental and Radical Innovation
Perceived Innovation by Intensity, abroad	Not mentioned	Not mentioned	Not mentioned	Radical Innovation	Not mentioned	Radical Innovation	Incremental and Radical Innovation

Note: Developed by the author (2020).

This session has been designed to present the data collected during the interview phase of this research. In the next chapter, the analyzed data is presented according to the literature review on OI and CVC.

6. CASE ANALYSIS

The research on OI has emphasized how established firms innovate, change their internal process, and business models by collaboration with external partners, such as universities (Perkmann & Walsh, 2007), and startups (Weiblen & Chesbrough, 2015). This has also been identified in this dissertation; thus, all analyzed companies use Outside-in OI processes, in the form of collaboration with universities and startups.

According to Chesbrough (2003) OI model, by the integration with external partners, through Outside-in (or Inbound) and Inside-out (or Outbound) OI, companies

can boost their innovation capabilities. These are two different models by which companies can apply OI. While the first allows external knowledge flows from the outside to the inside of the company, the second allows internal knowledge to flow outside of the company's borders (Gassmann & Enkel, 2004).

The strategy verified in all the companies analyzed is the Outside-In OI. Several advantages can be seen by the application of Outside-in OI, such as greater access to external knowledge, to the latest technologies available (Ceccagnoli, et.al 2018; Belderbos et.al, 2018), additionally to improvement of innovation performance (Leten & Vanhaverbeke, 2014; Weiblen & Chesbrough, 2015). The possibility of absorbing external knowledge and enhancing innovation is unlocked by the implementation and use of internal practices. As stated by Bagherzadeh et.al (2019), internal practices of knowledge sharing, and innovation strategy are important for successful outside-in OI activities.

An important factor discovered during the interviews is that the objective, the main motivation behind CVC investments, is strategic. Current research focuses on the effect of CVC on innovations as a strategic goal.

> “Unlike investments made for financial purposes, CVC investments are dominated by strategic goals entailing beneficial learning processes and the development of managerial capabilities in new technological domains, which in turn nurture corporate growth opportunities” (Baldi et.al, 2015, p. 222)

According to Pinkow & Iversen (2020), “the strategic objectives that can be pursued through CVC investments are (a) strengthening the core business, (b) leveraging the ecosystem, and (c) exploring new markets and technologies” (p.1). These strategic focus of CVC investments has been well-founded in practice: all the companies analyzed in this research have a common approach towards OI and CVC Investments. Their main objective to start a CVC Investment Fund is to obtain long-term strategic returns, mainly to increase the access to innovation and technological trends, as a window on technology. Napp & Minshall (2011), Dushnitsky & Lenox (2005), (Dushnitsky and Lavie (2010), Chesbrough (2002), Van de Vrande & Vanhaverbeke (2013) are among the scholars who support the view that firm’s

objective through CVC investing is to explore new technologies and access innovations.

The Corporate Venture Capital Report (2020) highlights that companies that perform CVC investments should expect strategic returns from their investments as well as long-term financial outcomes. In the same direction, the respondents in case 5 have demonstrated that their expectations of the CVC as a financial and strategic investment vehicle, similar to the definition of balanced focus highlighted by Battistini et al (2013) who have classified the scope of CV activities as “strategic, financial, and balanced. The strategic scope focuses on option generation and acceleration of innovation, whereas the financial scope aims to diversification and financial return, and the balanced focus on both: strategic value and financial return” (p.37). As the respondents in case 5 have mentioned, their objective with the fund should not be entirely financial, but mainly strategic.

Concerning the location, the interviewed companies invest in startups in Brazil as well as abroad. Case 4, for example, perform CVC investments outside Brazil through an alliance between three major players in the automotive sector, the investments are made in developed ecosystems, such as the USA, China, Israel, and Europe. The case 6 and 7 are Brazilian companies that perform CVC investments outside Brazil as a way to increase the investment portfolio. As CVC's objective is strategic, a way to engage with new technologies, it makes sense to expand the scope of investments, covering different regions with diverse opportunities, thereby diversifying the investment portfolio. Which corroborates with the theory, as stated by Lin and Lee (2011), companies that diversify their investment portfolio have greater growth potential.

Regarding CVC investment process, the practice has revealed similarities with what have been observed in theory, as all respondents have established forms to interact with the external environment and have found forms to diminish the risks of these collaborations. The interviewees in cases 1, 2, 6 and 7 have stated that the company implemented different forms of OI strategies, such as Startup Acceleration Program, contact with Universities, and research institutions, before it first started the CVC activities. These types of OI are the starting point to the change process and a smoother way to overcome the challenges of OI implementation.

In the case 1, the company has developed and implemented the Startup Acceleration Program for two years before starting to draw what would be the CVC Fund, during this period the company has also developed a partnership program with universities and research institutions. In case 2, the OI process matured for two years before the company started the process of implementing the CVC. The sixth case has also developed a Startup Acceleration Program, which has enabled a softer way to connect with the startup ecosystem, enhance innovation opportunities, and improve internal processes, which would further improve the relation with external new ventures. The seventh case has begun the OI process during the early 90's with connection with external companies as well as universities. This process has allowed the company to advance on the OI strategy that has led to the current situation, in which the company has established deep connections with startups, created a CVC investment fund in Brazil and instituted its participation in a VC fund in the US.

As already stated in this dissertation, Startup Acceleration Programs are part of Corporate Venturing strategies (Chesbrough, 2019). Corporate Incubators (Pauwels et al., 2016) and Corporate Accelerators (CAs) (Richter et al., 2018) are different forms of corporate engagement with startups. CAs are programs sponsored established firms to accelerate startups (Kurpjuweit & Wagner, 2020). "They have limited duration and support cohorts of startups during the new venture process via mentoring, education, and company-specific resources" (Shankar & Shepherd, 2018, p. 1). Large corporations usually implement this process as a way to tackle new technologies and radical innovations, keeping their usual business activities (Wikhamn & Styhre, 2017).

By implementing these programs, companies can improve their knowledge about how to work with startups, this preparation has been acknowledged as a way to implement process changes, as well as cultural and mindset shifts necessary to work with external new ventures (Kurpjuweit & Wagner, 2020). The fact that the interviewed companies with CVC investments in place have started the OI process by implementing Startup Acceleration Programs before they invest in external new ventures, leads to the notion that the CVC is a more advanced level of OI; thus, it involves greater risk (Gutmann, 2019). However, both approaches can be applied at the same time, combining different forms of OI.

> “The purpose of combining different types of open innovations is to overcome the disadvantages of each type and to exploit the advantages of all different types. At different development stages, a firm may make and implement corresponding strategic direction based on its innovation capacity and internal resource” (Yuan & Li, 2019, p. 1)

The case 5 differs from the other interviewed companies. Although all other respondents have mentioned the challenges to work with startups, they have started the process smoothly, by applying Startup Acceleration Programs before investing in CVC. Case 5, on the contrary, started to work with startups by making an investment, however, as stated by the respondents the company was not prepared to interact with external new ventures. Not only, they could not cope with the speed of the startup, but also the governance level was different between the two types of companies, which has made the process tougher and less efficient. Cases 3 and 4 also mentioned the challenges faced when working with startups. As a way of mitigating the risks and challenges of CVC investments, these companies started the OI strategy with Acceleration Programs. This pattern emphasizes the complex nature of the OI process, which requires a great deal of knowledge and resource allocation (Wikhamn & Styhre, 2019).

The governance factor has been brought up during the research as an important factor for the success of CVC investments. The interviewees on case 5 have mentioned that the governance differences between the company and the invested startups have been a barrier to the success of their first investment process. The findings on this research do not go against the research of Baldi, Baglieri & Corea (2015), as stated by the authors: “while corporates assume the responsibility of the role of managerial and technical coaching and financial support, startups provide their innovations''. The interviewee in case 6 mentioned the fact that the company, in addition to financing the activities of startups, also participates in the advisory board of the invested startups, as stated by Anokhin, Pecj & Wincent (2016) companies have different forms to interact with external new ventures that differ in the degree to which they support explorative and exploitative learning.

The sample of companies interviewed in this research is heterogeneous in terms of CVC investments. Cases 1 and 2 do not have CVC Investment Fund in place,

however, they are in the process of implementing one. These companies work with startups, however, do not invest in return of equity yet. Case 3 has an M&A strategy, nonetheless, due to the fact that the investee companies continue their operations separately from the investor, these investments can be considered similar to CVC. The fourth case has a CVC Fund in an alliance with other major players in its industry, but the investments in external new ventures are made outside Brazil. Case 5 has performed a single CVC investment as a way to start working with Startups. Currently, the company is working with external new ventures through Startups Acceleration Programs and is in the process of establishing a CVC Investment Fund.

The cases 6 and 7 have a mature process of CVC investments, as one of their OI strategies. Both companies invest through CVC in startups inside and outside Brazil. The difference between both cases is that in case 6 there is still no CVC Fund established, in case 7 there are two funds already implemented, one Brazil and one the USA.

In terms of types of innovation, it has become clear that all interviewed companies aim to increase organizational innovation, represented as cultural and mindset changes, when implementing Outbound OI strategies. These experimental results are consistent with previous empirical research. Naqshbandi, Kaur & Ma (2015) have found out the importance of cultural aspects to either create or harm OI initiatives. According to the authors, organizational culture paves the way to the OI process, while an integrative culture facilitates Outside-in OI, hierarchy culture slows down the process of both Outside-in and Inside-out OI.

Wikhamn (2016) has stated that “open innovation initiatives tend to challenge the firm’s strategic comfort zone by introducing more distributed structures and processes” (p.5). This description is deeply linked to the organizational innovation concept. Internal culture has been widely recognized by the OI literature as a fundamental principle for change (Gassmann et al., 2010). This characteristic was proved true in practice as the cultural aspect has been brought up by all interviewed companies. One of the main objectives of interviewed companies when implementing OI strategies is to break the status-quo, change the way of doing business, and transform the organizational culture.

Changes in internal processes in order to work with startups have been reported by all the respondents. Adjustments such as the implementation of agile and leaner methods have also been cited. Not only the research has shown the challenges faced by companies when working with startups, it has also been recognized by researchers the challenges encounter by incumbents in the process of implementing OI strategies, especially when establishing new structures (Huston & Sakkab, 2006), and changing culture (Gassmann et al., 2010).

Mortara and Minshall (2011) have studied the influence of internal as well as external culture in the implementation of OI processes adoption in large corporations. For the authors, the cultural heritage of companies plays an important role in OI process implementation and adoption, companies with a more outgoing culture are able to strengthen their OI capacities in both inbound and outbound processes. Further research regarding the mindset shifts towards an OI process culture has been reported by Nakagaki, Aber & Fetterhoff (2012) as one of the main challenges faced by Roche to implement an OI approach. According to the authors, OI can only be achieved when people are able to change not only their mindset, but also their behavior.

Regarding the role the cultural aspect plays in CVC investments, Lee & Kang (2015) have found out that the benefits of CVC investments in terms of new technological search are limited in firms with restricted capacity to absorb and incorporate these new technologies into their existing knowledge. Whereas companies with this ability experiment increase on technological innovation in different areas when investing in external new ventures through CVC.

Although, OI has proved to be an important asset in market innovation, particularly regarding the creation of new business models (Huang, Lai, Lin & Chen, 2013), the cases analysis in this dissertation have shown a less important effect of CVC investments in market innovation. This type of innovation has been mentioned as Business Model Innovation, solely by the respondents in case 3 and 7.

The interviewees in cases 3, 6 and 7 aim to increase product innovation when investing in external new ventures. The data collected in this dissertation reinforces the results of Cheng & Huizingh (2014) study, as the authors found out that OI activities are positively related to innovation performance, they highlighted the positive

relationship between OI activities, new product/ service development and customer as well as financial performance.

Process innovation is a common objective mentioned by all respondents when implementing OI programs (Startup Acceleration Programs) and have a minor effect when employing CVC investments. The engagement of companies with external parties enhances firms' possibility of establishing new processes (Tsinopoulos, Sousa & Yan, 2018) and it influences process innovation performance (Trantopoulos, von Krogh, Wallin & Woerter, 2017).

Regarding intensity, it has been revealed by the respondents that by implementing CVC strategies the companies' objectives are to change the status quo, get closer to the main technological trends, and to new and radical innovations that can change the direction of business. To expand the scope and possibilities for innovation, companies seek to invest in radical innovations inside and outside Brazil. These experimental results are consistent with previous empirical research results, according to the findings of Van de Vrande, Vanhaverbeke & Duysters (2011) alliances and CVC investments have a positive effect on the creation of pioneering technologies.

Incremental innovations were often cited by the respondents as an outcome of OI programs, such as Startup Acceleration Programs, being, therefore, not the major focus when it comes to CVC investments. Additionally, contrary to what has been observed in radical innovation investments, the investments on incremental innovation occur mainly inside Brazil. This data corroborates the findings of Tseng & Tseng (2019) about the relationship among corporate entrepreneurship and internal innovation performance. According to the authors, corporate entrepreneurship is a strategic approach for increasing internal innovation performance at corporations, which has also been highlighted by Zahra (2015) as a way to stimulate innovation and enhance company's productivity.

The long-term effects of OI strategies through CVC investments has been highlighted by the examination of the described cases. This finding has also been supported in the theory "CVC matters for a company's long-term performance and viability" (Yang, Narayanan & Zahra, 2009. p.271). As brought to light by the case analysis of this dissertation, the case 7 is the company that has shown a more

structured and long-term CVC investment strategy, and the one that has also recognized greater innovation outcomes from this process.

Throughout the case analysis in this dissertation, it was possible to recognize the Outside-OI as the mostly used strategy by the examined companies. The objective for companies to perform CVC investments is mainly strategic, as a way for them to access knowledge available externally. Additionally, it has become clear that OI practices, such as Startup Acceleration Programs, have been used as a tool to pursue incremental innovations. They are used as a way to start the relationship with external actors and are viewed as a less risky interaction with new ventures, commonly used as a prior step before a company implements CVC investment strategies. CVC investments are implemented by companies as a way to pursue OI. Radical and Product innovations have been found as an expected outcome of this process, together with organizational innovation in terms of cultural and mindset changes. The following table represents the main findings of this research.

Table 18. Main research findings

Research Question	Main findings
What are the motivations for CVC investments by incumbents with subsidiaries in Brazil?	1st. Strategic Objective 2nd. Financial Objective
How is the process of CVC investments developed by incumbents with subsidiaries in Brazil?	Startup Acceleration Programs are used as a tool to seek incremental and process innovations. Usually, they precede investments in CVC, except in case 5
How do incumbent companies with subsidiaries in Brazil perceive innovations by type (product, process, market and organizational) in CVC investments?	Radical and product innovations are expected in CVC investments. Incremental, process and market innovations are expected in other OI processes, such as internal and external Startup Acceleration Programs
How do incumbent companies with subsidiaries in Brazil perceive innovations by intensity (radical and incremental) in CVC investments?	Organizational innovation - cultural and mindset change - is expected in all OI strategies, including CVC

Note: Developed by the author (2020).

7. FINAL REMARKS

The main objective of this research was to understand how incumbents with subsidiaries in Brazil perceive innovation from CVC investments. The literature review as well as the data analyzed from the studied companies offered subsidies to answer the main questions regarding the goal of this study. The systematic review brought to light the fact that there is little research related to the theme of OI and CVC in Brazil and in Latin America. Most of the research on OI and CVC has been based in Europe, North America, and Asia, where also mostly CVC investments occur. In this view, this research was aimed at fulfilling this research gap. This dissertation brought specific data from the Brazilian market, which have not been widely explored by other researchers. From this work it was possible to understand from interviews and documents, how incumbents with subsidiaries in Brazil that perform OI strategies and invest in CVCs perceived innovation outcomes from this process.

The analyzed data highlighted the fact that the OI process is widespread in Brazil. All the interviewees in this dissertation have already implemented OI processes in their companies in order to increase their innovation capabilities no longer achieved by internal innovation processes alone. In this research it has been possible to verify that the Outbound or Outside-in OI process is the most used by the interviewed companies, which substantiates previous studies, as Chesbrough & Brunswicker (2014) have already mentioned, “outside-in open innovation is more often practiced than inside-out” (p.35).

Although OI is widely used in the country, the CVC investments, a form of OI, is still not common in Brazil. The interviewed companies have revealed that CVC is starting to be implemented in the country, as only two analyzed organizations already have well-defined CVC processes and only one has established CVC investment funds. This supports the view that CVC is still an emerging topic for companies located in Brazil.

Inversely to VC investors, which pursue mainly financial outcomes from startups, CVC is viewed as a strategic mechanism to increase access to knowledge and new technologies available externally and as a way to improve innovation performance. The interviewees have indicated that their engagement in OI activities

and more importantly in CVC investments is designed to bring strategic outcomes, such as access to new technologies and innovations available externally. The financial aspect, that is, the financial returns of this process, appears as a secondary objective according to these companies.

In this study, the focus has been on incumbent's engagement with startups by CVC investing. Although the research topic of this dissertation is CVC investments, it was possible to identify that many companies start their OI initiatives by applying Startup Acceleration Programs for internal and external startups. That is, by looking for startups from outside the organization as well as by launching new businesses from internal ideas and using internal resources. As highlighted by the data gathered in the case analysis, this process has given them confidence and generated important lessons for the implementation of CVC. Supporting the view that the development and implementation of CVC investments might have a greater chance of success when applied gradually, starting, for example, from Startup Acceleration Programs focused on internal and external new ventures.

As already shown in this study, when cooperating with startups, companies seek to enhance agility, create an innovative image, and boost the culture and mindset of innovation. While startups seek greater credibility, access to suppliers and channels distribution. From the collected data it was possible to analyze not only whether the incumbent companies are obtaining the expected returns from the cooperation with startups, but also their main motivations for carrying out CVC investments and how they develop it.

In terms of innovation outcomes, this means the perceived innovations by type and intensity in CVC investments, it has become clear from the data extracted from the interviews, that companies expect radical product innovations from CVC investments, as incremental, process and market innovations are expected in other OI processes, such as internal and external Startup Acceleration Programs. As radical innovation is one of the main motivations for interviewed companies when implementing CVC, many of them are not restricted to a single market. This means that these companies open up their investment strategies to diverse regions. Incremental innovations are likely to be expected in other forms of OI, but are not restricted to them, and can also occur when using CVC investments.

Mindset and culture changes, that is, organizational innovation, was one of the most important aspects brought by the interviewing companies when they implement OI strategies and investments in CVC. This aspect also seemed important even when the company uses other types of OI being not an exclusive outcome of CVC investments. Process innovations are expected in other forms of OI; nevertheless, they can also be seen as a secondary effect of CVC investments. Thus, companies that perform CVC investments are likely to implement other types of OI strategies first which could culminate in process innovations.

CVC is one possible approach to implement OI and allow companies to reach external knowledge and access new technologies. This strategy can support companies' efforts to keep up with the fast pace of technology, therefore increasing their chances of survival. The data gathered in this study provides evidence for future research to enhance the knowledge on how firms can engage in OI initiatives. In this view, it is important for future research to further analyze other external venturing strategies, and complementary CVC investments.

This dissertation has provided both theoretical and practical outcomes specially designed to incumbents. This limited focus could be expanded by analyzing the outcomes of OI and CVC investments for the invested new ventures. This means, to understand the innovation outcomes not only from the perspective of incumbents, as this dissertation has approached, but also from the invested companies' viewpoint. Future research is encouraged to address this issue. In addition to the contribution of CVC to other types of risk investments, such as VC investments, public investment funds.

Moreover, CVC investment is a new phenomenon in Brazil, fewer companies are implementing it, therefore there is a lack of data on the theme. For this reason, the analyzed companies are diverse in terms of CVC investment timing. The analyzed companies in this research were at different stages which hindered an adequate comparison between the cases studied. A recommendation for future research is to evaluate companies in similar CVC investment stages.

This constraint has, however, brought a benefit to the research. Thus, it was possible to notice a pattern in the behavior of these companies. The data gathered revealed that even companies in different sectors operate in a similar manner with

regard to the implementation of OI and CVC strategies. The pattern discovered in this dissertation can be used by managers to create a well-defined process before engaging in CVC investments. Managers should carefully consider whether CVC is the best approach to their organization by aligning the innovation objectives and the risks the organization is considering bearing to implement OI strategies.

For organizations that pursue incremental and process innovation, CVC investments might be not the best strategy, whereas it might be a good approach for those searching to enhance radical and product innovations. Additionally, the research has highlighted the benefits of implementing less risky strategies, such as Startup Acceleration Programs, before CVC investments take place, which should also be considered by other companies.

The state-of-the-art review has shown, several research on the theme of OI and more commonly regarding CVC used quantitative methods and longitudinal studies. In this view, future research could address the theme by using a quantitative research method and longitudinal studies. Additional limitation is that this study has an exclusive focus on CVC and its strategic and innovative outcomes for incumbents, excluding possible financial outcomes of this process which could also be further analyzed.

Ultimately, an important aspect that has not been examined by this research are possible constraints of the OI and CVC processes, such as Intellectual Property issues, which could by address in future research as a way to enhance the knowledge of different aspects that permeate the interaction of incumbents with external new ventures through OI and CVC investments.

In short, upcoming research can address the following topics: i) analyze complementary OI strategies; ii) analyze CVC investments by the invested startups point of view; iii) analyze how CVC can affect other types of risky investments, such as VCs and public funds; iv) evaluate companies in similar stages of CVC investments; v) evaluate companies in similar sectors; vi) broaden the scope for strategic and financial results; vii) include other aspects that permeate OI and CVC, such as Intellectual Property issues.

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APPENDIX I - STATE OF THE ART

To review the state of the art in regarding CVC and OI the Capes Portal (CAPES), Scopus and Web of Science (WOS) databases have been used. In order to ensure the quality of the academic work, only peer-reviewed journal articles written in English were considered. Hence, monographs, Ph.D. theses, working papers, editorial notes, symposia, presentation slides, and book reviews were excluded from the search. This systematic review has not been limited by specific journals; however, a limited timeframe (5 years) has been adopted.

A difference in the search filter has been used for the theme CVC and OI. For CVC, a search has been made considering the term “Corporate Venture Capital" in any part of the article’s text and for the term “Open Innovation” only in the title of the articles. Thus, one must consider the fact that there are a small number of studies that address CVC in comparison with OI, therefore, in order to deeply understand the studies in the area, a more expanded search was necessary. Conversely, the topic of OI has been widely debated by scholars since the publication of Chesbrough’s (2003) seminal book (Randhawa, Wilden & Hohbergeret, 2016) and there are numerous studies on the subject. It was understood, therefore, that a restricted search to the titles of the articles would be enough to understand the phenomenon.

The first database analyzed was the Capes Portal. Primarily, the search has been made for articles on the theme “Corporate Venture Capital” in any part of the text, resulting in 940 articles. Then, the search has been narrowed into years of publication (2015-2020), followed by type of material (articles), and language (English). These filters reduced the search to 252 articles. To ensure the quality of papers only peer reviewed articles were considered, resulting in 198 articles. In sequence, to ensure the correlation to the research area, the articles were filtered considering the topic of business, this search resulted in 114 articles.

All of them have been reviewed by the author first, by the title, followed by the key words, and abstract, finally narrowed into those that have correlation with the research objective. The following table shows the filter sequence used by the author to search for articles regarding CVC.

Table 19. Capes Portal Database search steps (CVC)

Filters		**Results**
Theme	“Corporate Venture Capital”	940
Year	2015 - 2020	306
Type of material	Articles	258
Language	English	252
Review	Peer Review	198
Topic	Business	114
Author Review	Title, Key Words, and Abstract	23

Note. Developed by the author (2020).

Afterwards, the search has evolved to the Scopus database. The search has been made for articles on the theme “Corporate Venture Capital” in the title, abstract, and keyword, resulting in 90 articles. The search has been narrowed down to articles written in English in the past 5 years, in the areas of Business, Management and Accounting. These filters reduced the search to 57 articles.

Articles already found in the previous database have been excluded and the remaining articles have been analyzed and reviewed by the author. All of the remaining articles have been reviewed by the author first, by the title, followed by the key words, and abstract, finally narrowed into those that have correlation with the research objective. The following table shows the filter sequence used by the author to search for articles regarding CVC.

Table 20. Scopus Database search steps (CVC)

Filters		**Results**
Theme	“Corporate Venture Capital”	90
Year	2015 - 2020	90
Topic	Business, Management and Accounting	71
Type of material	Articles	57
Language	English	57
Author Review	Title, Key Words, and Abstract	13

Note. Developed by the author (2020).

The last search on CVC has been made in the Web of Science database using the keyword “Corporate Venture Capital” in the past 5 years resulting in 58 articles. The search has been narrowed down to articles written in the topic of Business and Management. These filters reduced the search to 39 articles.

Articles already found in the previous databases have been excluded and the remaining articles have been analyzed and reviewed by the author. All of the remaining articles have been reviewed by the author first, by the title, followed by the key words, and abstract, finally narrowed into those that have correlation with the research objective. The following table shows the filter sequence used by the author to search for articles regarding CVC.

Table 21. WOS Database search steps (CVC)

Filters		**Results**
Theme	“Corporate Venture Capital”	58
Year	2015 - 2020	58
Topic	Business and Management	42
Type of material	Articles	39
Author Review	Title, Key Words, and Abstract	19

Note. Developed by the author (2020).

The total number of articles are 23 from Capes Portal, 13 from Scopus, and 19 from Web of Science database, totaling 55 analyzed articles on the theme Corporate Venture Capital.

A similar approach has been used to search for articles regarding OI. The first step was to search for articles containing the words “Open Innovation” in the title, resulting in 2.012 articles. Then, the search has been narrowed into years of publication (2015-2020), followed by type of material (articles), and language (English). These filters reduced the search to 1.011 articles. To ensure the quality of papers and the correlation to the research area, only peer reviewed articles were filtered considering the topic of business, this search resulted in 492 articles.

All of them have been reviewed by the author by the title, key words, and abstract and narrowed down into those that have correlation with the research objective. The following table shows the filter sequence used by the author to search for articles regarding OI.

Table 22. Capes Portal Database search steps (OI)

Filters		**Results**
Theme	“Open Innovation”	2.012
Year	2015 – 2020	1.171
Type	Articles	1.030
Language	English	1.011
Review	Peer Review	927
Topic	Business	492
Author Review	Title, Key Words, and Abstract	27

Note. Developed by the author (2020).

Following analogous steps, the search has evolved to Scopus database. The first step was to search for articles published in the last 5 years using the term “Open Innovation” in the title, resulting in 1.363 articles. Then, the search has been narrowed into the topic of business, resulting in 805 articles, followed by type of material (articles), and language (English). These filters reduced the search to 532 articles. Articles already found in the previous database have been excluded and the remaining articles have been analyzed and reviewed by the author. All of the remaining articles have been reviewed by the author first, by the title, followed by the key words, and abstract, finally narrowed into those that have correlation with the research objective. The following table shows the filter sequence used by the author to search for articles regarding OI.

Table 23. Scopus Database search steps (OI)

Filters		**Results**
Theme	“Open Innovation”	1.363

Year	2015 – 2020	1.363
Topic	Business	805
Type	Articles	532
Language	English	522
Author Review	Title, Key Words, and Abstract	33

Note. Developed by the author (2020).

Subsequently, using similar measures, the search has evolved to the Web of Science database. The first step was to search for articles published in the last 5 years using the term “Open Innovation” in the title, resulting in 804 articles. Then, it has been narrowed into the topic of Business and Management, resulting in 484 articles, followed by type of material (articles) reducing the search to 403 articles.

Articles already found in the previous databases have been excluded and the remaining articles have been analyzed and reviewed by the author. All of the remaining articles have been reviewed by the author first, by the title, followed by the key words, and abstract, finally narrowed into those that have correlation with the research objective. The following table shows the filter sequence used by the author to search for articles regarding OI.

Table 24. WOS Database search steps (OI)

Filters		**Results**
Theme	“Open Innovation”	804
Year	2015 – 2020	804
Topic	Business and Management	484
Type	Articles	403
Author Review	Title, Key Words, and Abstract	21

Note. Developed by the author (2020).

The total number of articles are 27 from Capes Portal, 33 from Scopus and 21 from Web of Science database, totaling 81 analyzed articles on the theme Open Innovation. In order to better understand the themes of OI and CVC and the state of the art on these two subjects, a systematic analysis has been developed. To start this

evaluation, a table has been organized, as follows, arranging the articles by database, year (from older articles to newer ones), journal of publication, author, and title.

Table 25. CVC Systematic Review Summary

Database	Year	Journal	Author	Title
SCOPUS	2015	Entrep. Res. J.	Baldi, F., Baglieri, D., & Corea, F.	Balancing Risk and Learning Opportunities in Corporate Venture Capital Investments: Evidence from the Biopharmaceutical Industry
WOS	2015	Strategic Management J.	Gaba, V., & Dokko, G.	Learning to let go: social influence, learning, and the abandonment of CVC practices
WOS	2015	Organizational Science	Paik, Y., & Woo, H.	The Effects of Corporate Venture Capital, Founder Incumbency, and Their Interaction on Entrepreneurial Firms' R&D Investment Strategies
WOS	2015	J. of Business Research	Sahaym, A., Cho, S. Y., Kim, S. K., & Mousa, F. T.	Mixed blessings: How top management team heterogeneity and governance structure influence the use of corporate venture capital by post-IPO firms
CAPES	2015	European J. of Innovation Management	Spender, J. C., Corvello, V., Grimaldi, M., & Rippa, P.	Startups and Open Innovation, a review of the literature
CAPES	2015	Small Business Economy	Bertoni, F., Colombo, M. G., & Quas, A.	The patterns of Venture Capital Investments in Europe
CAPES	2015	Industry and Innovation	Lee, S. M., Kim, T., & Jang, S. H.	Technological diversification through CVC investments creating various options to strengthen dynamic capabilities
CAPES	2015	Management Decision	Gompers, P., & Lerner, J.	Interorganizational knowledge transfer through CVC investment
CAPES	2015	Small Business Economy	Zahra, S. A.	Corporate entrepreneurship as knowledge creation and conversion: the role of entrepreneurial hubs
CAPES	2016	Entrepreneurship Theory and Practice	Titus Jr, V. K., & Anderson, B. S.	Firm Structure and Environment as Contingencies to the Corporate Venture Capital–Parent Firm Value Relationship
WOS	2016	Int. J. Entrepreneurial Venturing	Weber, C., Raibulet, V., & Bauke, B.	The process of relational rent generation in corporate venture capital investments
WOS	2016	Strategic Entrepreneurship J.	Weber, C., Bauke, B., & Raibulet, V.	An empirical test of the relational view in the context of CVC
WOS	2016	J. of Strategy and Management	Yang, Y., Chen, T., & Zhang, L.	Corporate venture capital program autonomy, corporate investors' attention, and portfolio diversification
WOS	2016	J. of Business Research	Anokhin, S., Peck, S., & Wincent, J.	Corporate venture capital: The role of governance factors
SCOPUS	2016	J. of Business Venturing Insights	Anokhin, S., Wincent, J., & Oghazi, P.	Strategic effects of corporate venture capital investments
WOS	2016	Int. J. Technology Management	Baierl, R., Anokhin, S., & Grichnik, D.	Coopetition in corporate venture capital: the relationship between network attributes, corporate innovativeness, and financial performance
WOS	2016	Strategic Management J.	Colombo, M. G., & Shafi, K.	Swimming with sharks in Europe: when are they dangerous and what can new ventures do to defend themselves?
WOS	2016	J. of Business Research	Galloway, T. L., Miller, D. R., Sahaym, A., & Arthurs, J. D.	Exploring the innovation strategies of young firms: Corporate venture capital and venture capital impact on alliance innovation strategy
WOS	2016	Information Systems Research	Kim, K., Gopal, A., & Hoberg, G.	Does Product Market Competition Drive CVC Investment? Evidence from the U.S. IT Industry

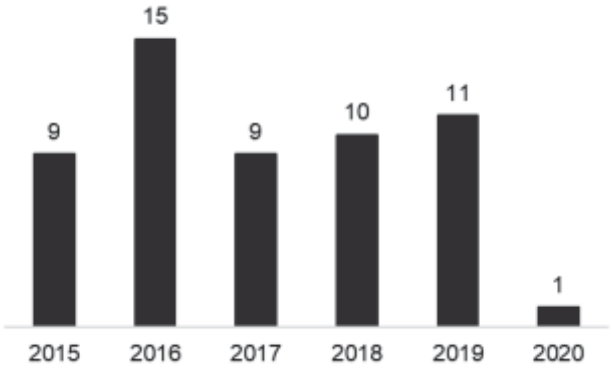
WOS	2016	J Technol Transf	Rossi, M., Festa, G., Solima, L., & Popa, S.	Financing knowledge-intensive enterprises: evidence from CVCs in the US
CAPES	2016	Strategic Management J.	Alvarez-Garrido, E., & Dushnitsky, G.	Are entrepreneurial venture's innovation rates sensitive to investor complementary assets? Comparing Biotech Ventures Backed by Corporate and Independent VC's
CAPES	2016	J. of Ecomomics and Management Strategy	Colombo, M. G., & Murtinu, S.	Venture Capital Investments in Europe and Portfolio Firm Economic Performance Independent vs Corporate Investors
CAPES	2016	J. of Business Venturing	Wadhwa, A., Phelps, C., & Kotha, S.	Corporate Venture Capital Portfolios and Firm Innovation
CAPES	2016	Strategic Entrepreneurship J.	Basu, S., Phelps, C. C., & Kotha, S.	Search and integration in external venturing: an inductive examination of corporate venture capital units
WOS	2017	Entrepreneurship Theory and Practice	Uzuegbunam, I., Ofem, B., & Nambisan, S.	Do Corporate Investors Affect Entrepreneurs' IP Portfolio? Entrepreneurial Finance and Intellectual Property in New Firms
SCOPUS	2017	International Journal on Media Management	Hasenpusch, T. C., & Baumann, S.	Strategic Media Venturing: CVC Approaches of TIME Incumbents
WOS	2017	Strategy Science	Kim, J. Y., & Park, H. D.	Two Faces of Early Corporate Venture Capital Funding: Promoting Innovation and Inhibiting IPOs
SCOPUS	2017	The Electricity J.	Livieratos, A. D., & Lepeniotis, P.	Corporate venture capital programs of European electric utilities: Motives, trends, strategies and challenges
WOS	2017	Technology Analysis & Strategic Management	Park, J. H., & Bae, Z. T.	When are 'sharks' beneficial? Corporate venture capital investment and startup innovation performance
CAPES	2017	J. of Management	Titus Jr, V., House, J. M., & Covin, J. G.	The Influence of Exploration on External Corporate Venturing Activity
CAPES	2017	J. of Management	Drover, W., Busenitz, L., Matusik, S., Townsend, D., Anglin, A., & Dushnitsky, G.	A review and road map of entrepreneurship equity financing research: VC, CVC, Angel Investment, Crowdfunding, and Accelerators
CAPES	2017	J. of Business Strategy	Kupp, M., Marval, M., & Borchers, P.	Corporate Accelerators: fostering innovation while bringing together startups with large corporations
CAPES	2017	J. of Management	Kim, J. Y., Steensma, H. K., & Park, H. D.	The Influence of Technological Links, Social Ties, and Incumbent Firm Opportunistic Propensity on the Formation of Corporate Venture Capital Deals
SCOPUS	2018	Management Review Quarterly	Gutmann, T.	Harmonizing corporate venturing modes: an integrative review and research agenda
WOS	2018	Entrepreneurship Research J.	Kang, H. D.	A Start-Up's R&D Stages and the Evolution of Financing Sources: Evidence from the Biotechnology Industry
SCOPUS	2018	European Management J.	Lin, J. Y.	What affects new venture firm's innovation more in corporate venture capital?
CAPES	2018	Strategic Management J.	Ceccagnoli, M., Higgins, M. J., & Kang, H. D.	Corporate Venture Capital as a Real Option in the Markets for Technology
CAPES	2018	Management Review Quarterly	Röhm, P.	Exploring the landscape of corporate venture capital, a systematic review of the entrepreneurial and finance literature
CAPES	2018	J. of Business Research	Lee, S. U., Park, G., & Kang, J.	The double-edged effects of the corporate venture capital unit's structural autonomy on corporate investors explorative and exploitative innovation
CAPES	2018	J. of Business Venturing	Belderbos, R., Jacob, J., & Lokshin, B.	Corporate venture capital (CVC) investments and technological performance: Geographic diversity and the interplay with technology alliances
CAPES	2018	Strategic Entrepreneurship J.	Di Lorenzo, F., & van de Vrande, V.	Tapping into the knowledge of incumbents: The role of corporate venture capital investments and inventor mobility

CAPES	2018	J. of Business Venturing	Shankar, R. K., & Shepherd, D. A.	Accelerating strategic fit or venture emergence: Different paths adopted by corporate accelerators
WOS	2018	Thunderbird Int. Bus. Rev.	Gonzales, J., & Ohara, F.	Chinese Venture Investments in the United States, 2010 - 2017
WOS	2019	Asian J. of Technology Innovation	Wang, L., Zhou, F., An, Y., & Yang, J.	Corporate venture capital: technological innovation or value creation? A comparative study of CVC- and IVC-invested Chinese listed companies
SCOPUS	2019	Entrepreneurship Theory and Practice	Titus Jr, V., Parker, O., & Covin, J.	Organizational Aspirations and External Venturing: The Contingency of Entrepreneurial Orientation
SCOPUS	2019	Int. J. Entrepreneurship and Small Business	Brinette, S., & Khemiri, S.	Identifying the determinants of corporate venture capital strategy: evidence from French firms
WOS	2019	Int. J. Entrepreneurial Venturing	Fischer, D., Kruse, D. P., Leonardy, H., & Weber, C.	Don't throw in the towel too early! How agency conflicts affect the survival of corporate venture capital units
SCOPUS	2019	The Society for Financial Studies	Ma, S.	The Life Cycle of Corporate Venture Capital
SCOPUS	2019	Economics of Innovation and New Technology	Maxin, H.	Corporate venture capital and the nature of innovation
SCOPUS	2019	Business Process Management J.	Rossi, M., Festa, G., Fiano, F., & Giacobbe, R.	To invest or to harvest? Corporate venture capital ambidexterity for exploiting /exploring innovation in technological business
CAPES	2019	Finance Research Letters	Röhm, P., Merz, M., & Kuckertz, A.	Identifying Corporate Venture Capital Investors
CAPES	2019	Business Horizons	Moschner, S. L., Fink, A. A., Kurpjuweit, S., Wagner, S. M., & Herstatt, C.	Toward a better understanding of corporate accelerator models
CAPES	2019	Research-Technology Management	Gutmann, T., Schmeiss, J., & Stubner, S.	Unmasking Smart Capital
SCOPUS	2019	Organization Science	Cirillo, B.	External learning strategies and technological search output: spinout strategy and corporate invention quality
SCOPUS	2020	California Management Review	Kurpjuweit, S., & Wagner, S. M.	A new model for managing corporate-startup partnerships

Note. Developed by the author (2020).

The year with the most publications was 2016, followed by 2019 and 2018. The following figure has a summary of the quantity of articles per year.

Figure 8. Number of articles on CVC per year



Note: Developed by the author (2020).

The number of articles per journal has also been evaluated. The following figure shows the Journals with at least two publications on the theme of CVC.

Figure 9. Quantity of articles per journal

Note: Developed by the author (2020)

Observing journals in which the articles were published, it is possible to notice that three stand out for the largest number of publications: Journal of Business Venturing, Journal of Business Research, and Strategic Management Journal.

The Journal of Business Venturing has four articles published. Wadhwa, Phelps & Kotha (2016) and Belderbos, Jacob, & Lokshin (2018) have analyzed to what extent CVC invested firms influence the innovation performance of corporate investors. While the first analyzes the influence of portfolio diversity of invested new ventures on the innovation performance of CVC investors, the second evaluates the geographic diversity and its impact on investor technological performance. Anokhin, Wincent & Oghazi (2016) studied the strategic effects of CVC investments. The same journal published a study developed by Shankar & Shepherd (2018) who analyzed different paths adopted by corporate accelerators.

The Strategic Management Journal and the Strategic Entrepreneurship Journal have published four articles concerning CVC from the perspective of incumbents and from new ventures. Alvarez-Garrido & Dushnitsky (2015) and Di Lorenzo & Van de Vrande (2018) have analyzed the phenomenon from invested new ventures point of view. In another direction, Basu, Corey, & Kotha (2015) have analyzed incumbent's possible gains in terms of external knowledge search and integration when using CVC units. Followed by Ceccagnoli, Higgins & Kang (2018) that have investigated the relationship of CVC investments with internal Research and Development (R&D) as a path towards corporate external knowledge acquisition.

The Journal of Business Research has four articles published on the subject between 2015 and 2918. Three of them have investigated the governance factors involving CVC investments. Sahaym, Cho, Kim, & Mousa (2015) have explored how top management team heterogeneity and governance influence CVC investments. Followed by Anokhin, Peck, & Wincent (2016) and Lee, Park, & Kang who have also investigated the governance factors of CVC investments.

Other important journals are Small Business Economy, Strategic Entrepreneurship Journal, and Strategic Management Journal, that have published two and three articles, respectively. The article published by Bertoni, Colombo & Quas (2015) at Small Business Economy Journal have analyze European models of Venture Capital Investments, mainly, independent VC, corporate VC, bank affiliated VC and governamental VC and observed a substantial difference between investment patterns in Europe and USA, especially regarding to riskier investments. While in the USA

independent VCs fund young risk new ventures, in Europe this type of investment is made by governamental VCs.

Regarding CVC, which is the main topic of this research, they have discovered a significant change over time in particular after the Internet bubble, different from other types of investors that have remained stable over time. Zahra (2015) is another author whose study has been published by the Journal, however, with a focus on the innovation and productivity progress of corporates when applying Corporate Entrepreneurship (CE) activities, predominantly concentrated on the role of entrepreneurial hubs in the process of CE.

The Journal of Management has three published articles regarding CVC, all of them were written in 2017. The article written by Titus, House and Covin (2017) related to CV, namely the firm's exploration influence on external CV. The second article has its focus on types of entrepreneurial equity financing, including VC, CVC, Angel Investment, Crowdfunding, and Accelerators (Drover, Busenitz, Matusik, Townsend, Anglin & Dushnitsky, 2017). While the third article has a major focus on CVC, especially regarding technological proximity between new ventures and established companies, and potential collaborative opportunities (Kim, Steensma, & Park, 2017).

The relationship of CVC and innovation performance of incumbent firms have been analyzed by several authors. Lee & Kang (2015) research has focused on the effects of CVC investments on incumbents' technological diversity and dynamic capabilities intensity. A curvilinear inverted U-shape relationship has been found, showing that even though there is a positive relationship, from a certain point, CVC investment diversification has weakened technological diversity. Wadhwa, Phelps & Kotha (2015) have also found a curvilinear inverted U-shape correlation between portfolio diversity and investor's innovative performance. Geographic diversity of CVC investments has been studied by Belderbos, Jacob & Lokshin (2018), the authors found a positive relationship between geographic diverse CVC investments on invertor's technological performance, as long as there is no knowledge overlap.

The benefits for incumbents when associating with startups, as additional ways of innovating, have been studied by Kupp, Marval & Borchers (2017). The role of knowledge transfer from startups and incumbents has been covered by Lee, Kim & Jang (2015) whose study has analyzed to what extent CVC investment facilitates

knowledge transfer from invested new ventures to investor company. Furthermore, corporate entrepreneurship is considered to be a great source of knowledge acquisition (Zahra, 2015). Di Lorenzo & Van de Vrande (2018) have analyzed the opposite direction of knowledge transfer, from corporate investor to the new venture.

The exploration/exploitation innovation framework have been analyzed by Titus et al (2017) which have studied how firm's exploration knowledge search affects its external corporate venturing (ECV) activities such as: CVC investments, joint ventures, and acquisitions. Lee et al (2018) have focused on the operational aspects of CVC investments, namely regarding how the structure independence of CVC units influence explorative and exploitative innovation performance of incumbents.

Some authors have more than one article published, Varkey Titus, Massimo Colombo have written three articles, while Gary Dushnitsky and Patrick Röhm have two articles published in the given period. Carrey Phelps & Suresh Kotha have written two articles together, both in 2016, however with diverse topics, namely regarding external venturing and external knowledge acquisition, and CVC influence on firm's innovation performance.

The methodologies used are well divided into qualitative and quantitative methods. Most investigations have been focused on European Countries, the United States, and Asia. Among the collected articles there is no focus on how the phenomenon occurs in Brazil or Latin American countries. This is, however, a preview analysis of methodological and geographical focus used in the published articles. An extended analysis to deeper understand methodological procedures as well as the geographical focus of the studies related to CVC is, therefore, needed.

After an analysis of the articles addressing CVC, a similar investigation was made for the OI. The following table has a summary of the founded articles, organized by database, year (from older articles to newer ones), journal of publication, author, and title.

Table 26. OI Systematic Review Summary

Database	Year	Journal	Author	Title
Scopus	2015	Int. J. Technology Management	Chen, J., Zhao, X., & Wang, Y.	A new measurement of intellectual capital and its impact on innovation performance in an open innovation paradigm

Scopus	2015	European J. of Innovation Management	Greco, M., Grimaldi, M., & Cricelli, L.	Open innovation actions and innovation performance
Scopus	2015	J. of Business Strategy	Schneckenberg, D.	Open innovation and knowledge networking in a multinational corporation
Scopus	2015	Technological Forecasting & Social Change	Wang, C. H., Chang, C. H., & Shen, G. C.	The effect of inbound open innovation on firm performance: Evidence from high-tech industry
CAPES	2015	Research-Technology Management	Chesbrough, H; Brunswicker, S	A Fad or a Phenomenon? The Adoption of Open Innovation Practices in Large Firms
CAPES	2015	European Management J.	Saebi, T., & Foss, N. J.	Business models for open innovation: Matching heterogenous open innovation strategies with business model dimensions
CAPES	2015	Management Decision	Cheng, C. C., & Shiu, E. C.	The inconvenient truth of the relationship between open innovation activities and innovation performance
CAPES	2015	J. of Engineering and Technology Management	Cheng, C. C., Yang, C., & Sheu, C.	Effects of open innovation and knowledge-based dynamic capabilities on radical innovation: An empirical study
WOS	2016	Technology Analysis & Strategic Management	Ahn, J. M., Ju, Y., Moon, T. H., Minshall, T., Probert, D., Sohn, S. Y., & Mortara, L.	Beyond absorptive capacity in open innovation process: the relationships between openness, capacities, and firm performance
Scopus	2016	Business Process Management J.	Battistella, C., De Toni, A. F., & Pessot, E.	Practicing Open Innovation: A framework of reference
Scopus	2016	Management Decision	Milan, E., Ulrich, F., Faria, L. G., & Li-Ying, J.	Exploring the impact of open innovation on firm performances
Scopus	2016	Strategic Management J.	Cassiman, B., & Valentini, G.	Open Innovation: are inbound and outbound knowledge flows really complementary?
Scopus	2016	International J. of Innovation Management	Nitzsche, P., Wirtz, B. W., & Göttel, V.	Innovation Success in the context of Inbound Open Innovation
Scopus	2016	Innovation: Management, Policy & Practice	West, J., & Bogers, M.	Open innovation: current status and research opportunities
CAPES	2016	J. of Product Innovation Management	Randhawa, K., Wilden, R., & Hohberger, J.	A Bibliometric Review of Open Innovation: Setting a Research Agenda
CAPES	2016	Industry and Innovation	Bogers, M., Zobel, A. K., Afuah, A., Almirall, E., Brunswicker, S., Dahlander, L., ... & Hagedoorn, J.	The Open Innovation Research Landscape: Established Perspectives and Emerging Themes Across Different Levels of Analysis
CAPES	2016	Management Decision	Caputo, M., Lamberti, E., Cammarano, A., & Michelino, F.	Exploring the impact of open innovation on firm performances
CAPES	2016	European Management J.	Greco, M., Grimaldi, M., & Cricelli, L.	An analysis of the Open Innovation Effect on Firm Performance
CAPES	2016	Academy of Marketing Science	Rubera, G., Chandrasekaran, D., & Ordanini, A.	Open innovation, product portfolio innovativeness and firm performance: the dual role of new product development capabilities
CAPES	2016	International Journal of Innovation Management	Wikhamn, B. R., & Styhre, A.	Open Innovation as facilitator for corporate exploration
CAPES	2016	International Journal of Innovation Management	Hecker, A., & Ganter, A.	Organizational and technological innovation and the moderating effect of open innovation strategies
CAPES	2016	J. of Product Innovation Management	Zobel, A. K.	Benefiting from Open Innovation: A Multidimensional Model of Absorptive Capacity
CAPES	2016	European J. of Innovation Management	Usman, M., & Vanhaverbeke, W.	How start-ups successfully organize and manage open innovation with large companies
WOS	2017	European J. of Innovation Management	Alberti, F. G., & Pizzurno, E.	Oops, I did it again! Knowledge leaks in open innovation networks with start-ups

Scopus	2017	Business Process Management J.	Lassen, A. H., & Laugen, B. T.	Open innovation: on the influence of internal and external collaboration on degree of newness
WOS	2017	International J. of Innovation Management	Jang, H., Lee, K., & Yoon, B.	Development of An Open Innovation Model For R&D Collaboration Between Large Firms And Small-Medium Enterprises (SME's) In Manufacturing Industries
WOS	2017	International J. of Innovation and Technology Management	Sag, S., Sezen, B., & Alpkan, L.	Determinants of Open Innovation and their Interrelations
WOS	2017	J. of Organizational Change Management	Shi, X., & Zhang, Q.	Inbound open innovation and radical innovation capability: The moderating role of organizational inertia in collaboration networks
Scopus	2017	J. of Knowledge Management	Shin, S. R., Han, J., Marhold, K., & Kang, J.	Reconfiguring the firm's core technological portfolio through open innovation: focusing on technological M & A
CAPES	2017	Research-Technology Management	Gassmann, O., Enkel, E., & Chesbrough, H.	The Future of Open Innovation
CAPES	2017	Chinese Management Studies	Zhou, H., Yao, Y., & Chen, H.	How does Open Innovation Affects Firm Performance
CAPES	2017	Business Process Management J.	Oltra, M. J., Flor, M. L., & Alfaro, J. A.	Open Innovation and Firm Performance: the role of organizational mechanism
CAPES	2017	J. of Knowledge Management	Natalicchio, A., Ardito, L., Savino, T., & Albino, V.	Managing knowledge assets for open innovation: a systematic literature review
CAPES	2017	International J. of Innovation Management	Jackson, P., & Richter, N.	Situational Logic: Na Analysis of Open Innovation using Corporate Accelerators
CAPES	2017	Creative Innovation Management	Richter, N., Jackson, P., & Schildhauer, T.	Outsourcing creativity: An abductive study of open innovation using corporate accelerators
Scopus	2018	Eurasian Business Review	Bzhalava, L., & Cantner, U.	The journey towards open innovation: why do firms choose different routes?
WOS	2018	Asian J. of Technology Innovation	Cheng, C. C., & Sheu, C.	Enhancing radical innovation: the interplays of open innovation activities, firm capabilities, and environmental dynamism
Scopus	2018	Technological Forecasting & Social Change	Lopes, A. P. V. B. V., & de Carvalho, M. M.	Evolution of the open innovation paradigm: Towards a contingent conceptual model
WOS	2018	Technology Analysis and Strategic Management	Fu, L., Liu, Z., & Zhou, Z.	Can open innovation improve firm performance? An investigation of financial information in the biopharmaceutical industry
Scopus	2018	Review of Managerial Science	Nylund, P. A., Ferras-Hernandez, X., & Brem, A.	Automating profitably together: Is there an impact of open innovation and automation on firm turnover?
Scopus	2018	J. of Innovation & Knowledge	Moretti, F., & Biancardi, D.	Inbound open innovation and firm performance
WOS	2018	Strategic Entrepreneurship J.	Eckhardt, J. T., Ciuchta, M. P., & Carpenter, M.	Open innovation, information, and entrepreneurship within platform ecosystems
WOS	2018	Baltic J. of Management	Wang, X., & Xu, M.	Examining the linkage among open innovation, customer knowledge management and radical innovation: The multiple mediating effects of organizational learning ability
Scopus	2018	Chinese Management Studies	Yuan, X., & Li, X.	The combination of different open innovations: a longitudinal case study
Scopus	2018	J. of Engineering and Technology Management	Zhang, S., Yang, D., Qiu, S., Bao, X., & Li, J.	Open innovation and firm performance: Evidence from the Chinese mechanical manufacturing industry
WOS	2018	J. of Innovation & Knowledge	Rauter, R., Globocnik, D., Perl-Vorbach, E., & Baumgartner, R. J.	Open innovation and its effects on economic and sustainability innovation performance

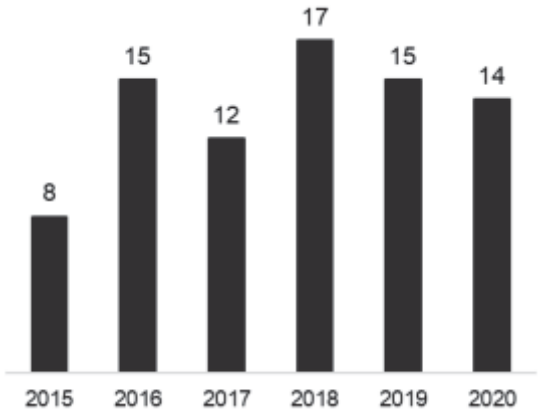
CAPES	2018	Research-Technology Management	Brunswicker, S., & Chesbrough, H.	The Adoption of Open Innovation in Large Firms
CAPES	2018	International Journal of Innovation Management	Teplov, R., Albats, E., & Podmetina, D.	What does Open Innovation mean? Business vs Academic perceptions.
CAPES	2018	J. of Organizational Change Management	Fernandes, C., Ferreira, J., & Peris-Ortiz, M.	Open Innovation: Past, present, and future trends
CAPES	2018	J. of Product Innovation	Chesbrough, H., Lettl, C., & Ritter, T.	Value creation and Value Capture in Open Innovation
CAPES	2018	IEEE Transactions on Engineering Management	Bagherzadeh, M., Markovic, S., Cheng, J., & Vanhaverbeke, W.	How Does Outside-In Open Innovation Influence Innovation Performance? Analyzing the Mediating Roles of Knowledge Sharing and Innovation Strategy
CAPES	2018	Research-Technology Management	Zynga, A., Diener, K., Ihl, C., Lüttgens, D., Piller, F., & Scherb, B.	Making Open Innovation Stick: A Study of Open Innovation Implementation in 756 Global Organizations
WOS	2019	International J. of Innovation	Bogers, M., Burcharth, A., & Chesbrough, H. W.	Open Innovation in Brazil: Exploring Opportunities and Challenges
Scopus	2019	J. of Business Strategy	Onetti, A.	Turning open innovation into practice: trends in European corporates
Scopus	2019	Creative Innovation Management	Pellizzoni, E., Trabucchi, D., & Buganza, T.	When agility meets open innovation: two approaches to manage inbound projects
WOS	2019	Research Policy	Hannen, J., Antons, D., Piller, F., Salge, T. O., Coltman, T., & Devinney, T. M.	Containing the Not-Invented-Here Syndrome in external knowledge absorption and open innovation: The role of indirect countermeasures
Scopus	2019	European J. of Innovation Management	Han, C., Thomas, S., Yang, M., & Cui, Y.	The ups and downs of open innovation efficiency: the case of Procter & Gamble
WOS	2019	J. of Knowledge Management	Matricano, D., Candelo, E., Sorrentino, M., & Martínez-Martínez, A.	Absorbing in-bound knowledge within open innovation processes. The case of Fiat Chrysler Automobiles
WOS	2019	California Management Review	Lee, Y., Fong, E., Barney, J. B., & Hawk, A.	Why Do Experts Solve Complex Problems Using Open Innovation? Evidence from the U.S. Pharmaceutical industry
WOS	2019	International J. of Innovation Management	Wikhamn, B. R., & Styhre, A.	Open Innovation Groundwork
Scopus	2019	Engineering Management in Production and Services	Walecka-Jankowska, K., & Zimmer, J.	Open innovation in the context of organisational strategy
Scopus	2019	R&D Management	Remneland Wikhamn, B.	Open innovation change agents in large firms: how open innovation is enacted in paradoxical settings
Scopus	2019	Creative Innovation Management	Remneland Wikhamn, B., & Styhre, A.	Corporate hub as a governance structure for coupled open innovation in large firms
WOS	2019	Technological Forecasting & Social Change	Scuotto, V., Beatrice, O., Valentina, C., Nicotra, M., Di Gioia, L., & Briamonte, M. F.	Uncovering the micro-foundations of knowledge sharing in open innovation partnerships: An intention-based perspective of technology transfer
WOS	2019	Technology Analysis & Strategic Management	Sun, Y., Liu, J., & Ding, Y.	Analysis of the relationship between open innovation, knowledge management capability and dual innovation
CAPES	2019	Cogent Business & Management	Le, H. T. T., Dao, Q. T. M., Pham, V. C., & Tran, D. T.	Global Trend of Open Innovation Research: A Bibliometric Analysis
CAPES	2019	Technology Analysis & Strategic Management	Cammarano, A., Michelino, F., & Caputo, M.	Open innovation practices for knowledge acquisition and their effects on innovation output
Scopus	2020	International J. of Project Management	Barbosa, A. P. F. P. L., Salerno, M. S., de Souza Nascimento, P. T., Albala,	Configurations of project management practices to enhance the performance of open innovation R&D projects

			A., Maranzato, F. P., & Tamoschus, D.	
Scopus	2020	Industrial Marketing Management	Chesbrough, H.	To recover faster from Covid-19, open up: Managerial implications from na open innovation perspective
Scopus	2020	International J. of Project Management	de Melo, J. C. F., Salerno, M. S., Freitas, J. S., Bagno, R. B., & Brasil, V. C.	From open innovation projects to open innovation project management capabilities: A process-based approach
Scopus	2020	Technological Forecasting and Social Change	Noh, H., & Lee, S.	What constitutes a promising technology in the era of open innovation? An investigation of patent potential from multiple perspectives
Scopus	2020	Business Process Management J.	Liao, S., Fu, L., & Liu, Z.	Investigating open innovation strategies and firm performance: the moderating role of technological capability and market information management capability
Scopus	2020	Research Policy	Masucci, M., Brusoni, S., & Cennamo, C.	Removing bottlenecks in business ecosystems: The strategic role of outbound open innovation
WOS	2020	Asian J. of Technology Innovation	Li, R., Fu, L., & Liu, Z.	Does openness to innovation matter? The moderating role of open innovation between organizational ambidexterity and innovation performance
WOS	2020	International J. of Innovation Management	De Groote, J. K., & Backmann, J.	Initiating Open Innovation Collaborations between Incumbents and Startups: How Can David and Goliath Get Along?
Scopus	2020	Industry and Innovation	Milan, E., Ulrich, F., Faria, L. G., & Li-Ying, J.	Exploring the impact of organisational, technological and relational contingencies on innovation speed in the light of open innovation
WOS	2020	Innovation Organization & Management	Nobakht, M., Hejazi, S. R., Akbari, M., & Sakhdari, K.	Exploring the relationship between open innovation and organisational ambidexterity: the moderating effect of entrepreneurial orientation
Scopus	2020	Technology in Society	Lyu, Y., Zhu, Y., Han, S., He, B., & Bao, L.	Open Innovation and Innovation Radicalness—the Moderating Effect of Network Embeddedness
WOS	2020	European J. of Innovation Management	Shi, X., Lu, L., Zhang, W., & Zhang, Q.	Managing open innovation from a knowledge flow perspective: the roles of embeddedness and network inertia in collaboration networks
Scopus	2020	Technological Forecasting & Social Change	Sengupta, A., & Sena, V.	Impact of open innovation on industries and firms – A dynamic complex systems view
Scopus	2020	J. of Business Research	Zacharias, N. A., Daldere, D., & Winter, C. G.	Variety is the spice of life: How much partner alignment is preferable in open innovation activities to enhance firms' adaptiveness and innovation success?

Note. Developed by the author (2020).

The year with the most publication was 2018, followed by 2016 and 2019. The following figure has a summary of the quantity of articles per year.

Figure 10. Number of articles on OI per year



Note: Developed by the author (2020).

Following the same analysis as made for CVC, the number of articles per journal has been evaluated, as shown in the following figure.

Figure 11. Quantity of articles per journal

Note: Developed by the author (2020)

The journal with the largest number of publications on OI is the International Journal of Innovation Management, with eight articles. The theme of corporate innovation performance by using OI strategies has been highlighted in most articles, however with different perspectives. Wikhamn (2016) have analyzed OI as an

approach to enhance corporate exploration of innovations. Nitzsche, Wirtz, & Göttel (2016) have analyzed the phenomenon of Inbound OI and possible innovations outcomes of this process. Followed by Jackson & Richter (2017) who have studied OI strategies as a path for established firms to develop radical innovations through startups, mainly throughout corporate accelerator programs. While Hecker and Ganter (2015) evaluated the external R&D activities and its effect on both organisational and technological innovation. While, Jang, Lee, & Yoon (2017) and de Grote & Backmann (2020) have analyzed how the collaboration between large corporations and startups takes place.

Two articles had a major focus on the meaning and studies already developed on the theme of OI. Teplov et al (2018) have analyzed the meaning of OI and the difference between its concept in academia and in business. The authors have inferred that there is a lack of understanding on the subject in the business world, when contrasted to the scientific knowledge around the phenomenon. Whereas Wikhamn & Styhre (2019) have analyzed the groundwork on the phenomenon.

The European Journal of Innovation Management has five published articles on OI in the selected period. The articles written by Greco, Grimaldi, & Cricelli (2015) as well as Han, Thomas, Yang, & Cui (2019) have analyzed OI application and its innovation outcomes in large corporations. Usman & Vanhaverbeke (2017) Alberti & Pizzurno (2017) have analyzed how large corporations and startups organize and manage their collaboration process. Studies related on how to ensure the adoption of OI approach in large and established firms could also be found in the work of Chesbrough & Brunswicker (2015); Chesbrough et al (2017), and Zynga,Diener, Lüttgens, Piller, & Scherb (2018). Shi, Lu, Zhang, & Zhang (2020) have further studied the knowledge flow from the perspective of OI processes.

Other two journals have published five articles each. The Technological Forecasting & Social Change Journal and the Business Process Management Journal. Six of the articles analyze the impact of OI strategies in the innovation performance (Wang, Chang, & Shen, 2015; Lassen & Laugen, 2017; Alfaro, Oltra, Flor, 2017; Oltra, Flor, & Alfaro, 2018; Liao, Fu, & Liu, 2020 and Sengupta & Sena, 2020). The two remaining articles one of each Journal were regarding the framework of OI (Battistella, De Toni, & Pessot, 2016) and a conceptual model for OI (Lopes & de Carvalho, 2018).

Whereas other two articles have a major focus on technological transfer in OI projects (Scuotto, Beatrice, Valentina, Nicotra, Di Gioia & Briamonte, 2019) and patent potential in a multiple perspective (Noh & Lee, 2020).

The European Management Journal has two published articles regarding OI in this period, being one correlated to OI influence on firm's innovation performance (Greco et al, 2016). The same occurred with the Journal of Product Innovation Management, the first is a bibliometric review on OI (Randhawa, Wilden & Hohberger, 2016) and the second, written by Zobel (2016), has focused on possible firm's competitive benefits in terms of product innovation when using OI strategies. The author found out a positive relationship between external technological access and product innovation.

The Research-Technology Management Journal has four published articles, three of them being written by Henry Chesbrough and colleagues. Chesbrough & Brunswicker have written, in 2015, the first version of an article analyzing the extent to which established firms are adopting OI practices, the same study has been reviewed by the authors in 2018. The results showed that 80 percent of companies that participated in the study are using OI strategies in 2018. Meanwhile, in 2017, Chesbrough has written an article explaining the future of the OI phenomenon. The fourth article analyses the implementation of OI practices in 756 organizations around the globe (Zynga, Diener, Ihl, Lüttgens, Piller, & Scherb, 2018).

Henry Chesbrough is the author with the largest number of published articles, six in total. Chesbrough & Brunswicker (2015 and 2018) have analyzed the adoption of OI in large firms. Chesbrough, et.al (2017) studied the future of OI. Chesbrough, Lettl & Ritter (2018) regarding the value creation and capture when firms use OI strategies. The authors preconized that the OI paradigm will only last if there is value generation for companies when applying this strategy. Bogers, Burcharth, & Chesbrough (2019) explored the opportunities and challenges of the OI phenomenon in Brazil. A recent article written by Chesbrough (2020) has evaluated how companies can recover from Covid-19 by applying OI initiatives.

Colin Cheng has two articles published in different journals, the Management Decision and in the Journal of Engineering and Technology Management. Both articles have the focus on innovation performance outcome from OI activities. While Cheng &

Shiu (2015) have investigated the impact of inbound and outbound OI activities on incremental as well as radical innovation outcomes. Cheng, Yang & Sheu (2016) have analyzed the theme by a dynamic capabilities' viewpoint. They examined how knowledge capabilities influence the effectiveness of open inbound and outbound activities on radical innovation performance.

Paul Jackson & Nancy Richter have together contributed to the theme of OI with two studies regarding Corporate Accelerators. One of the articles is focused on the most important elements and characteristics of corporate accelerator programs (Richter, Jackson & Schildhauer, 2017). While the other one has as a main purpose to identify problems faced by corporates and startups as both parts collaborate in corporate accelerator programs (Jackson & Richter, 2017).

The methodologies used are well divided into qualitative and quantitative methods. Most of the studies have been concentrated in European Countries, the United States, and Asia. Among the collected articles there is little focus on how the phenomenon occurs in Brazil nor Latin American. Only one article has focused on Brazil specifically about the opportunities and challenges of OI application in the country (Bogers, Burcharth, & Chesbrough, 2019).

As a primary review this analysis focuses on basic aspects of methodological and geographical focus used in the published articles. An extended analysis to deeper understand methodological procedures as well as the geographical focus of the studies related to OI is, therefore, needed.

A final analysis has been made considering the terms "Open Innovation" and "Corporate Venture Capital" together in the three databases (Capes Portal, Scopus, and Web of Science).

The first search has been made at the Capes Portal database. Primarily, it has been made a search for articles containing the words "Open Innovation" and "Corporate Venture Capital" in any part of the text, resulting in 93 articles. Then, the search has been narrowed into years of publication (2015-2020), followed by type of material (articles), and language (English). These filters reduced the search to 37 articles. To ensure the quality of papers and the correlation to the research area, only peer reviewed articles were filtered considering the topic of business, this search resulted in 22 articles. All of them have been reviewed by the author by the title, key

words, and abstract and narrowed down into those that have correlation with the research objective. This search resulted in 6 articles, however, 3 of those are already at the database of OI or CVC and have been excluded from this final analysis.

The following table shows the filter sequence used by the author to search for articles regarding OI and CVC.

Table 27. Capes Portal Database search steps (OI and CVC)

Filter		Results
Theme	“Corporate Venture Capital” and “Open Innovation”	93
Year	2015 - 2020	40
Type of material	Articles	39
Language	English	37
Review	Peer Review	36
Topic	Business	22
Author Review	Title, Key Words, and Abstract	3

Note. Developed by the author (2020).

The second search has been made at the Scopus database. The first step was to search for articles published in the last 5 years containing the words “Open Innovation” and “Corporate Venture Capital” in the title, abstract, and key words, resulting in 9 articles. Then, the search has been narrowed into the topic of Management, Business and Accounting, followed by type of material (articles), and language (English). These filters reduced the search to 5 articles which were all already at the database of OI or CVC and have been excluded from this final analysis.

The last search has been made at the Web of Science database. The first step was to search for articles published in the last 5 years containing the words “Open Innovation” and “Corporate Venture Capital” in the title, abstract, and key words, resulting in 3 articles. Then, the search has been narrowed into the topic of Business and Management followed by type of material (articles). These filters reduced the search to 3 articles which were all already at the database of OI or CVC and have been excluded from this final analysis.

Business Process Management Journal, Research-Technology Management and Journal of Technology Transfer contained the three articles. These studies have been published between the years of 2016 and 2018. Respectively, Battistella, De Toni & Pessot (2017) have analyzed what are the potential options for European companies when applying OI. As stated by the authors, CVC can be a possible outbound OI practice. Gobble (2018) have focused on the types of Corporate Venturing, which the author has divided into three types: “alliances, internal venturing, and corporate venture capital” (2018, p.58). Rossi, Festa, Solima, & Popa (2016) have analyzed the phenomenon of CVC regarding its financial returns in US companies.

As noticed by the search on OI and CVC, there is not much evidence of both phenomena being analyzed together as a way to enhance product, process, organizational, and market innovation outcomes of incumbent firms. Additionally, there is no study regarding the subject in Brazil or Latin America region. These results open space for further analysis on the subject in Brazil and in Latin America, as well as, considering both phenomena together.

APPENDIX II - CASE STUDY PROTOCOL

Table 28. Case Study Protocol

Section A - Research Overview	
Research Problem	How do incumbents with subsidiaries in Brazil perceive innovation from CVC investments?
Research Objective	Understand how incumbents with subsidiaries in Brazil perceive innovation from CVC investments.
Unit of analysis	Managers who have a direct role or great knowledge about the OI strategy and CVC investments in the organization.
Section B - Data Collection Procedures	
Data collection Planning	Validate a data collection instrument with the qualification panel. Validate the method of identification and choice of the case to be studied with the qualifying panel. Draw up a list of possible cases to be studied in Brazil. Get in touch with possible cases to find out if there is an interest in participating in the research.
Evidence collection	Draw up a list of organizations that are interested and willing to participate in the research. Schedule interviews with the most appropriate managers. Send an Informed Consent Form by email to the managers participating in the research. Conduct an interview and request access to documents that may be useful for the research.
Section C – Questions for Data Collection	
Interview script	Appendix III of this dissertation
Section D - Case Study Report Guide	
Report audience	Members of the evaluation board. Researchers in the area of Innovation and CVC Business Managers willing to make successful CVC investments. Startups willing to carry out alliances and access funding from incumbents.
Report Preparation	Define the structure for the results' presentation. Describe and analyze the case. Describe the motivations for CVC investments by incumbents with subsidiaries in Brazil.

	Describe the process development of CVC investments by incumbents with subsidiaries in Brazil. Identify the innovations by type (product, process, market, and organizational) perceived by incumbents with subsidiaries in Brazil in CVC investments. Identify the innovations by intensity (incremental and radical) perceived by incumbents with subsidiaries in Brazil in CVC investments.

Note. Developed by the author (2020).

APPENDIX III – INTERVIEW SCRIPT

I. Name of the organization
II. Role of the interviewee in the company
III. Number of employees:
    - up to 19 employees
    - from 20 to 99 employees
    - from 100 to 499 employees
    - more than 500 employees.
IV. Does the company apply OI, the innovation flows across organizational boundaries?
V. What are the types of OI strategies applied by the company: Outbound, Inbound or Coupled?
VI. Is the motivation to apply CVC strategic, with focus on option generation and acceleration of innovation, financial aiming at diversification and financial return, or balanced with focus on both strategic and financial returns? (Usman & Vanhaverbeke, 2017; Dahlander & Gann, 2010; Gassmann and Enkel, 2005).
VII. Is the motivation to apply CVC strategic, with focus on option generation and acceleration of innovation, financial aiming at diversification and financial return, or balanced with focus on both strategic and financial returns? (Battistini et al (2013).
VIII. Is there independence between the investor and investee? Is the investment counterpart a minority equity share?
IX. How did the development process of CVC investments take place?
X. How did the development process of CVC investments take place?
XI. Has the company started the OI strategy with a Startup Acceleration Program - complementary external innovation to push an existing corporate innovation, before implementing CVC investments - the participation in the success of external innovation and gain strategic insights into non-core markets (Chesbrough, 2019).

Types of innovations perceived by the company in CVC investments:

- Identify and describe perceived product, process, market, and organizational innovations in CV investments.

i. Intensity of innovations perceives by the company in CVC investments:
    - Identify and describe perceived radical incremental innovations in CVC investments.