How do funding intensity and type influence initial public offering and strategic orientation of startups?

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Abstract

This study investigates the role of funding type and intensity on the time companies need to reach initial public offering (IPO). Based on a sample of 2727 US startups going public between 1995 and 2023 it was demonstrated that firms backed by corporate venture capital (CVC) experience significant shorter time to IPO especially when investments were done as a lead investor. Furthermore, it has been shown that firms with small and frequent funding amounts are statistically more likely to reach IPO sooner. These findings crossed with the strategic framework of ambidexterity, revealed that startups having shorter time to IPO tend also to show signs of a great balance between exploration and exploitation. This study provides new insights into strategic decisions of startups and investors during the pre-IPO funding journey of these firms to access public markets more quickly.

Keywords: Time to IPO, Funding Intensity, Venture Capital, Corporate Venture Capital, Independent Venture Capital, Ambidexterity

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Resumo

Este estudo investiga o papel do tipo e da intensidade do financiamento no tempo que as empresas precisam para atingir a oferta pública inicial (IPO). Com base numa amostra de 2727 startups norte-americanas que se tornaram públicas entre 1995 e 2023, foi demonstrado que as empresas apoiadas por capital de risco corporativo (CVC) experienciam um tempo significativamente mais curto para atingir o IPO, especialmente quando os investimentos foram feitos como investidor principal. Além disso, foi demonstrado que as empresas com montantes de financiamento pequenos e frequentes têm estatisticamente mais probabilidades de chegar à IPO mais cedo. Estas conclusões, cruzadas com o quadro estratégico da ambidestria, revelaram que as empresas em fase de arranque com um tempo mais curto para a IPO tendem também a mostrar sinais de um grande equilíbrio entre a exploração e o aproveitamento. Este estudo fornece novos conhecimentos sobre as decisões estratégicas de startups e investidores durante a jornada de financiamento pré-IPO destas empresas para aceder mais rapidamente aos mercados públicos.

Palavras-chave: Tempo para IPO, Intensidade de Financiamento, Capital de Risco, Capital de Risco Corporativo, Capital de Risco Independente, Ambidexteridade

Titulo: Como a intensidade e o tipo de financiamento influenciam a oferta pública inicial e a orientação estratégica das startups?

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List of Abbreviations

CVC	Corporate Venture Capital
HR	Hazard Ratio
IPO	Initial Public Offering
IVC	Independent Venture Capital
SME	Small and Medium Enterprise
US	United States
VC	Venture Capital
VCs	Venture Capitalists

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1. Introduction

Startups operate in environments characterized by high uncertainty, where adaptability and resilience are essential for survival and growth. This uncertainty is particularly pronounced in today's context of rapid technological advancement and global economic volatility, which are reshaping industries and challenging traditional business models (Lamperti et al., 2024). Emerging disruptive technologies, such as artificial intelligence, blockchain, and the Internet of Things, are driving this transformation, demanding that companies continuously innovate to remain competitive (Haefner et al., 2021). These rapid shifts present unique challenges, especially for small and medium enterprises (SMEs), which are often constrained by limited resources and are consequently more vulnerable to market disruptions (Lamperti et al., 2024).

A promising tool to address these challenges is the rising strategic framework of ambidexterity. This concept is defined across literature as the need for organizations to balance exploration (innovative activities) and exploitation (efficiency-driven performance) (Sinha, 2015). This balance is particularly relevant in volatile environments where startups must not only adapt to frequent changes making sure they have the right degree of innovation to remain competitive (exploration) but also sustain growth (exploitation, performance) (Nardi & Charles, 2022). However, achieving this equilibrium is resource-intensive, and therefore highlights the importance of external financing. In the context of startups, venture capitalists (VCs) are the ones playing a crucial role here, fostering innovation and enabling the growth of these companies (Gill et al., 2024). Evidence suggests that venture capital (VC) backed companies often dominate their markets, with many achieving remarkable success (e.g. AirBnB, Coinbase, Doordash, SpaceX, etc.). Given this, analyzing the impact of funding on the strategic orientation of startups (ability to balance exploration and exploitation) could provide valuable insights. To narrow the scope of my analysis, two aspects of funding are considered.

Funding intensity, reflecting the pace at which startups receive their funding resources. This will serve as an indicator whether the company more exploits or explores the funding they receive.

Funding type as this has been already proven in literature having a strong impact on startups (Rossi et al., 2019; Shuwaikh et al., 2025). Prior research has shown that Corporate Venture Capital (CVC) and Independent Venture Capital (IVC) have different strategic impacts. CVC investments often align with ambidextrous strategies, while IVC investments are typically more exploitative (Rossi et al., 2019).

A critical event for evaluating these dynamics is the Initial Public Offering (IPO). IPOs represent the preferred exit strategy for VCs, offering the highest returns (Bayar & Chemmanur, 2011; Cochrane, 2005). The time to IPO is recognized as a key strategic performance indicator for startups (Chang, 2004). It reflects not only the influence of investors but also the strategic decisions startups make to balance exploration and exploitation in pursuit of growth. Exploring how variables impact this event, will enable to draw conclusions between funding characteristics and strategic orientation of startups.
To address these topics, the following research question was formulated:

> *"How do funding intensity and type (CVC vs. IVC) influence the time to IPO and strategic orientation (exploration vs. exploitation) of startups?"*

This study will use a dataset of 2727 startups in the United States (US) that went public between 1995 and 2023. For each startup, information on all VC investments from the first funding round to the IPO will be retrieved to ensure a detailed analysis. This data serves as a base for all four Cox proportional hazard models that will be performed. These models will analyze the impact of funding intensity and type on the time to IPO of each startup. Once these results obtained, they will be linked in a last step with the current literature about ambidexterity to draw a conclusion on the interaction between the significant factors that were found and the strategic framework of ambidexterity.

By addressing a critical gap at the intersection of venture capital financing and the strategic framework of ambidexterity, this study contributes to the current scientific research. While existing literature on (I)VC and CVC has extensively explored topics such as underpricing (Lee & Wahal, 2004) and the positive impact on post-IPO performance (Benkraiem et al., 2023), relatively little attention has been given to the role of financing in shaping IPO timing. Moreover, IPO timing has traditionally been analyzed in relation to market sentiment or startup performance based on internal metrics (Babich & Sobel, 2004), leaving still insufficient understanding of how external financing characteristics influence this strategic milestone.

This thesis offers a novel perspective by examining the influence of funding type and intensity on IPO timing and linking these insights to the strategic ambidexterity framework. By doing so, it integrates financing dynamics with the balance of exploration and exploitation, which is crucial for navigating actual turbulent environments. Despite the growing importance of ambidexterity in strategic management literature, its application to startups remains

underexplored (Sinha, 2015). Lubatkin et al. (2006) highlighted that SMEs face unique challenges in balancing exploration and exploitation compared to larger, more established firms. This study provides empirical evidence that contributes to bridging this gap, offering a deeper understanding of how financing decisions influence strategic orientation and IPO timing for startups.

Several practical implications for startups and investors results from this thesis. For startups, the findings offer valuable insights into key factors that influence the time to IPO. This can enable them to make informed decisions about their financing strategies to reach IPO sooner. Furthermore, understanding the strategic characteristics shaped by funding types and intensity provides startups with actionable guidance to better navigate volatile and rapidly evolving environments. For investors, the study shows how different funding frequencies and approaches impact startup performance and their path to IPO. It highlights opportunities to optimize funding strategies and adjust strategic synergies to align more effectively with the strategic orientation of their clients.

The structure of this thesis is organized as follows: the next section provides a theoretical background on the concept of ambidexterity, the factors influencing IPO timing, and the relationship between funding type and intensity and the strategic framework of ambidexterity. This section also outlines the hypotheses that will guide the research. The third section details the data and methodology used in this study, explaining the models and conditions applied to test the hypotheses. The fourth section presents the empirical results and interprets them considering the strategic framework of ambidexterity. Finally, the study ends with an examination of its limitations, recommendations for future research opportunities, and a comprehensive conclusion.

2. Theoretical Background

2.1. Exploration and Exploitation: shaping strategic orientation of startups

Strategy is a broad area of study, covering many ways organizations deal with challenges. In this thesis, the focus is on strategic orientation, looking at how startups manage two major challenges: limited resources and the need to perform well in both the short and long term.

Startups usually work with fewer resources than big companies. They have less money, less time, and fewer people to get things done (Sinha, 2015). At the same time, they must perform well in very short term to survive while also planning for future growth to stay competitive in fast-changing markets (Teece et al., 1997). Managing both goals is especially tough for startups. Unlike large companies that can set up separate teams or departments to handle short-term tasks and long-term goals, startups often must adress everything with small teams operating with internal restricted hierarchical systems (Lubatkin et al., 2006).

In research, these two goals are often described as exploration and exploitation. Exploration is about trying new ideas, creating innovative products, and finding new opportunities. It involves taking risks and experimenting to prepare for the future (Sinha, 2015). Exploitation, on the other hand, focuses on improving and making the most of what already exists, such as refining products, using resources efficiently, and achieving quick results through steady and repeatable action (March, 1991).

Research has shown that young companies often lean toward exploratory activities (Lubatkin et al., 2006), such as actively seeking out new information (Zahra et al., 2000). However, as startups transition into growth phase, they must shift focus to better utilize their existing resources (Sinha, 2015). At the same time, startups cannot afford to lose the agility and entrepreneurial spirit that initially has driven their success. While exploring new opportunities helps drive innovation, focusing too much on it can mean missing chances to improve and build on what they already do well (exploitation), highlighting the need for a balanced approach to maximize performance. March (1991) warns that achieving this balance is not easy. Firms may end up being average at both exploration and exploitation if they fail to navigate the tension between these two strategies effectively.

This balance between exploration and exploitation is often called organizational ambidexterity (Tushman & O'Reilly, 1996) and helps startups adapt to changing environments while ensuring operational efficiency. The term "ambidexterity" was first introduced by Duncan in 1976 (Sinha, 2015) and is now widely understood as the ability of organizations to pursue exploration and exploitation at the same time (Birkinshaw & Gibson, 2004). Throughout the years, researchers have identified three key approaches to achieving ambidexterity. The first is structural ambidexterity, where exploration and exploitation are managed in separate units or structures within the organization (Tushman & O'Reilly, 1996). Another approach is domain separation, which involves balancing exploration and exploitation across different areas of the

organization, such as regions or product lines, to maintain equilibrium (Lavie & Rosenkopf, 2005). Finally, contextual ambidexterity focuses on creating a culture where employees can engage in both types of activities. This is done by shaping the organization's systems, values, and processes to support a flexible working environment (Birkinshaw & Gibson, 2004).

This shows how deeply ambidexterity is integrated in the different levels of organizations. Researchers agree that maintaining a good balance between exploration and exploitation leads to enhanced innovation and strengthens competitive advantage.

2.2. Time to IPO: critical factors to observe

Extensive research has been conducted on the factors influencing the success and timing of an IPO. Among multiple other metrics such as firm performance indicators (CAPEX, ROA, leverage, …) and industry-specific variables like the Herfindahl index, Pagano (1998) and other authors have consistently highlighted firm size as a key factor positively affecting the likelihood of an IPO.

Babich and Sobel (2004) explored the question of optimal IPO timing focusing on internal company metrics. Their findings suggest an optimal threshold IPO stopping rule based on variables such as demand, capacity, prior sales and profits, and the risk-free discount rate. These internal factors provide insights into when a company might be strategically ready to go public (Babich & Sobel, 2004).

In addition to firm-specific metrics, external market conditions significantly influence IPO timing. Research has shown strong evidence that global market sentiment impacts the time to IPO. For example, simulations done by Giot and Schwienbacher (2007) indicate that moving from a "quiet" IPO market to a highly active one can reduce the median time to IPO (since the first financing round) by approximately 30%. These timing decisions are often described as taking advantage of "windows of opportunity." This concept suggests that IPOs are strategically timed to coincide with favorable market conditions, allowing firms to secure better financing terms (Ritter, 1991).

This aligns with earlier studies on stock market liquidity, which emphasize the importance of robust stock markets for venture capital exits. Liquid stock markets facilitate easier exits,

reducing risk for investors and enhancing the overall attractiveness of venture capital markets (Giot & Schwienbacher, 2007; Lerner, 1994).

From a funding perspective, an IPO is often seen as the most desirable exit strategy for venture capitalists, as it typically delivers the highest returns (Bayar & Chemmanur, 2011). Research on startups in Japan, analyzing over 10,000 cases, indicates that equity financing at the founding stage can significantly accelerate the timing of an IPO (Honjo, 2020). Additionally, the characteristics of the VC firms themselves can influence the timing of their exits through IPOs (Bock & Schmidt, 2014).

Several factors within the venture capital ecosystem have been found to positively impact the time to IPO. Chang (2004), in a study of internet startups, identified three key factors: the reputation of VCs, the amount of money raised, and the size of their strategic alliance networks. Furthermore, the quality of VC monitoring, as indicated in a study by Pommet (2017) by the duration of their investment before the IPO, plays a critical role in enhancing company survival.

Hsu (2013) highlights a significant tradeoff between rapid market entry and long-term sustainability in disruptive markets. Venture capitalists often reduce the time to IPO for startups in industries experiencing rapid technological change, aiming to capitalize on favorable market conditions and secure future funding. While this approach can accelerate the time to IPO, it may come at a cost such as fewer patents, lower survival rates, and weaker stock performance after the IPO (Hsu, 2013). This underscores the complexity of balancing short-term market opportunities with long-term growth and stability.

2.3. Investor types and their role in strategic orientation

Unlike traditional IVC funds, which operate as limited partnerships, CVC funds are private equity funds established as subsidiaries of large corporations (Guo et al., 2015). This leads to several differences between the two types of funds. One significant difference lies in the investment time frame: IVCs are bound by a contractually enforced ten-year lifespan, necessitating a quicker return on investments. In contrast, CVCs benefit from longer investment horizons due to their corporate backing (Chemmanur et al., 2014). Additionally, the objectives of these funds differ. While IVC funds are focused on maximizing financial returns, CVC programs also prioritize strategic benefits, such as the development of new, related business

opportunities that align with long-term goals of the parent company (Dushnitsky, 2012). As a result of these differences, IVC fund managers tend to focus more on achieving quick exits, whereas CVC fund managers are less pressured to do so, allowing for greater flexibility in the management of their investments (Guo et al., 2015).

Due to the involvement of the corporate parent, CVC funds can offer startups more industry-specific knowledge and support compared to IVC funds, enabling them to foster innovation more effectively within their portfolio companies (Chemmanur et al., 2014). CVCs often invest early in a company's lifecycle (Dushnitsky, 2012). Furthermore, Guo et al. (2015) shows, analyzing US startups from 1969 to 2008, that CVC backed startups receive approximately 23% more funding than those financed by IVCs. This highlights confidence and support of the CVC investors when they do investments.

CVC investors may also benefit from reduced exposure to the institutional pressures that influence IVC decision-making. While IVCs face coercive pressures from co-investors, normative expectations within the venture capital ecosystem, and strict timelines imposed by their limited partners (Guler, 2007), CVCs operate with greater strategic flexibility. However, this flexibility comes with its own challenges. Rather than being driven only by performance and financial returns, CVC investments require a lot of alignment discussions among business units, R&D teams, and corporate development managers to ensure the investments support the broader strategic objectives of the parent company (Jeon & Maula, 2022).

All these advantages could enable CVCs to focus resources and expertise on accelerating the startup's development, potentially bringing it to an IPO more quickly than IVC. This leads to the first hypothesis:

> *Hypothesis 1 (H1): CVC-backed firms exhibit shorter IPO timelines compared to IVC-backed firms, driven by the strategic goals of parent corporations.*

CVC investors focus not only on financial performance but also on driving innovation for their parent companies. Many researchers study how CVCs manage to balance innovation and financial returns through ambidexterity. This balance involves using CVC investments to explore new opportunities while focusing on the core business of the parent company to exploit

existing strengths, creating long-term performance and survival benefits (Hill & Birkinshaw, 2014).

Rossi (2019) classified about 64.7% of the CVC funds she analyzed over the years as ambidextrous, effectively combining exploration and exploitation. Hill and Birkinshaw (2014) emphasized that not all CVCs achieve the same results, but those acting ambidextrously tend to last longer. This is because they make better use of both the existing capabilities of the parent company and the innovative potential of the startups they invest in.

The benefits of CVC for startups, particularly at the time of IPO and afterward, have also been studied. Startups with CVC backing tend to achieve higher valuations at IPO compared to those without. These higher valuations have especially been seen in startups that have a strong strategic alignment with the parent corporation of the CVC (Benkraiem et al., 2023; Ivanov & Xie, 2010).

Given the benefits CVC investors bring through their ambidextrous behavior, particularly to the startups they support, it is anticipated that this study will also reveal a positive impact on startups before their IPO, as assumed in H1. Building on this expectation and the concept of ambidexterity, the following second hypothesis was developed:

> *Hypothesis 2 (H2): CVC backed firms achieve ambidexterity by balancing exploration and exploitation, enabling both accelerated IPO timelines and superior long-term post-IPO performance.*

2.4. Linking funding intensity to time to IPO

Companies that choose to go public tend to raise more money and participate in more funding rounds compared to companies that are either acquired or liquidated (Gompers, 1995). In the same way, Shuwaikh et al. (2024) found that follow-on investments incentivize IVC-backed companies to pursue IPO exits. Furthermore, Guo et al. (2015) and Chang (2004) observed that the total amount raised was positively significant with the IPO likelihood, suggesting that the more money a startup could raise, the faster the IPO would occur. Thus, one can conclude that funding intensity have an impact on the trajectory a startup chose to go to IPO.

Venture capital firms usually focus on high-risk investments. Research shows that the top 10% of VC investments generated 62% of all returns (Scherer & Harhoff, 2000). However, more than 30% of these investments ended up losing money (Sahlman, 1990).
One way to manage this uncertainty is by engaging in sequential investments across a large number of financing rounds (Bergemann & Hege, 1998; Gompers, 1995). Venture capitalists utilize a dynamic learning model, where past investments inform future decisions emphasizing the balance between exploitation of known opportunities and exploration of new ones, allowing VCs to adapt their strategies based on real-time feedback (Sorensen, 2008). Additional investment rounds help reduce information asymmetry (Guler, 2007). Studies examining the dynamics between venture capitalists and the companies they support highlight the challenges posed by information asymmetry in these partnerships (Gompers, 1995). Investors can learn about the probability of success through incremental investments (Guler, 2007).

Greater confidence and better knowledge about the company CVC invested in, could likely push them to bring startups faster to IPO, as this event often boost even more the performance of startups as mentioned in section 2.2. On the other hand, Bayless and Chaplinsky (1996) stated that firms will launch their IPO when information asymmetries about the value of the firm between the firm and the investors are low. Thus, the following hypothesis has been formulated and will be explored in this study:

> *Hypothesis 3 (H3): Frequent and smaller funding rounds are associated with shorter IPO timelines, as they reduce uncertainty through sequential investment strategies.*

3. Data and Methodology

3.1. Sample selection

The sample for this study focuses on US-based firms, given the United States' position as the largest and most active venture capital market, often regarded as a global benchmark (Hege et al., 2008). The timeframe spans IPOs from 1995 to 2023 to capture both historical and contemporary trends, expanding beyond earlier research that predominantly analyzed periods up to 2008 (Guo et al., 2015; Hsu, 2013). This extended period not only incorporates more recent data but also reflects the last two waves of CVC investments identified by Dushnitsky

(2012), which began in the mid-1990s and mid-2000s. Focusing on this timeframe ensures the inclusion of key phases in CVC evolution, especially important as CVC investments are rare compared to IVC and provides a robust and representative dataset.

To gather all information on pre-IPO investment metrics for VC backed companies and investors, the Thomson Reuters database was used, matching time series data for all VC investments (both firm and fund) with corresponding details for each VC-backed company. The distinction between CVC and IVC investments was made following Shuwaikh et al. (2024), by choosing in the database the type of fund investor whether as a "Corporate or PE/Venture Fund" for CVC funds or "Independent Private Partnership" for IVC. Only investments with this classification were considered for the analysis.

After filtering out companies that did not match the criteria for the type of fund investor and excluding companies in the financial sector due to their distinct business models (Foerster & Sapp, 2005), a final sample of 2727 VC-backed IPOs, of which 438 were CVC-backed and 2289 were backed by IVCs was retained.

For the analysis, focus was placed on major investments that could have a strategic impact on the company's growth. To ensure this, investments made by lead investors were selected, defined according to Kang et al. (2022) as the investor with the largest equity investment in the company at the round date. In cases of a tie, the lead investor is the one who invested the longest time ago and has the largest total fund size. This also allows to get a proper time series dataset, where in each timeframe only one critical investment occurs. Additionally, only investments occurring before the IPO date were retained in the dataset. The final dataset consists of 9434 observations.

Several robustness checks and data cleaning steps were implemented to ensure the quality of the data. First, a manual verification was conducted to ensure that companies that had gone public were also listed in the IPO dataset by Jay R. Ritter, which includes all IPOs of U.S.-founded companies from 1975 to the end of 2023. This dataset is widely used in the literature, such as in Hsu (2013), to validate IPO data. Additionally, all investment dates were rechecked for consistency, ensuring that each company had distinct investment dates. Some rows provided additional information about investors, resulting in duplicate entries. Finally, duplicates were checked for, and missing values were appropriately handled.

3.2. Variables

A selection of dependent, independent, and control variables was made to analyze the factors influencing the time to IPO for VC backed startups. Additionally, both time-varying variables and time-invariant covariates were introduced to account for the impact of intermediate changes, such as market conditions, as well as the cumulative effect of all VC investments throughout the company's growth, rather than considering only one overall investor profile for the firm. The data is structured such that each company can have multiple lead VC investors, each making several investments leading up to the IPO. Consequently, each row in the dataset corresponds to one investment made by a lead VC investor, with only one lead investor associated with each investment. Data related to the firm or fund will only be updated when the lead investor changes for a company and remains constant for the same investor over time. Data related to the company, such as total funding received, number of rounds, or number of investor firms, are constant over time and are referenced to the moment when the company goes public.

The *time to IPO* is used as the dependent variable in this study and serves as a common proxy for startup performance, particularly given the absence of traditional performance metrics such as profitability or market share in early-stage ventures (Stuart et al., 1999). Also referred to as the incubation period or IPO timing, it is measured by the time (in years) between the first VC financing round and the IPO event. In this sample, the mean time to IPO is 5.814 years for IVC backed firms and 5.607 years for CVC backed firms, as shown in Table 1.

Funding intensity is analyzed using both time-invariant and time-varying covariates: Time-invariant covariates reflect cumulative effects over the entire funding lifecycle of a startup. The number of investor firms represents the total count of all investors contributing to funding the firm, irrespective of the size of their individual investments. The number of investment rounds indicates the total rounds conducted by venture capital investors from the first VC investment to the IPO date. Frequency of funding rounds is calculated as $(Number\ of\ Rounds - 1)\ /\ (Last\ Investment\ Date - First\ Investment\ Date)$, providing a measure of the pace of funding activity in relation to time. Time-varying covariates capture characteristics that may fluctuate over time, such as the size of one round, which measures the total equity invested by all investors in a single funding event.

The *funding type* variables in this study primarily consist of a CVC vs. IVC dummy, which definition will change across models, along with two time-varying covariates that capture specific characteristics of the VC investment firms. As the funding type variables will be added in a second step on the baseline model, varying the definition of the CVC vs. IVC dummy ensures to enhance the robustness and depth of the analysis. It allows for sensitivity checks to confirm consistent results across different categorizations and captures differences in investor roles.

The CVC vs. IVC variable is defined in three different ways: (1) as a binary time-varying variable that changes over time based on whether the lead investor in a specific funding round is a CVC or IVC, (2) as a binary non-time-varying variable that indicates whether a company received any CVC investment at any point during the funding journey, and (3) as a binary non-time-varying variable that shows if a CVC acted specifically as a lead investor at any stage of the funding process.

Characteristics of the VC firms were also included, as these factors can influence how quickly a company reaches an IPO (Bock & Schmidt, 2014). For example, the variable "Capital Under Management" was used to measure the experience of a VC firm, as it reflects the amount of trust and capital they have received from others. This was considered a better measure of experience than simply looking at the age of the firm. Fund size was chosen as another important variable, as it indicates the resources available to a VC firm for investment. Firms backed by more experienced VCs tend to have longer incubation periods (Hsu, 2013).

Many numeric variables, such as total funding received, the size of one investment round, the capital under management, and fund size, showed extreme values and a strong right-skew in their distribution. To address this, these variables were transformed using a logarithmic scale to bring their distributions closer to normal and make them easier to interpret in the model. This transformation helps ensure that the results are more reliable and that extreme values do not distort the analysis.

As discussed in section 2.2 numerous factors have been studied in previous literature and founded to significantly influence the time to IPO for startups. These factors can be grouped into three main categories such as firm size, recent performance, and market sentiment (Pagano et al., 1998). To control for the impact of the broader environment, three key variables were included in all models. First, total funding received is used as a proxy for firm size, capturing both the overall scale of the company and additional funding information. Second, the IPO

market index, as defined by J. Ritter and utilized by studies like Chang (2004), is incorporated to isolate the effects of the general IPO market environment. This index is calculated by measuring the change between the offer price and the first day closing price for all US companies that went public. The data for this index was retrieved from J. Ritter's website, and values were linked to each investment based on the corresponding month and year to best capture the market conditions at the time of each investment. Lastly, the number of IPOs occurring in each month was included as a second variable to reflect the overall dynamics of the IPO environment, which has been shown to play a critical role in IPO timing. It is expected that both metrics will show a positive significant relationship with the time to IPO, suggesting that firms are more likely to go public faster in bullish markets compared to bearish ones.

3.3. Statistical Model

The Cox proportional hazard model is used in this study to analyze the time between the first VC investment, which acts as the starting point, and the IPO, which represents the specific event of interest. This model is particularly suitable because it allows the examination of how various factors (referred to as covariates) influence the time it takes for a company to go public. Its application is a common approach in research exploring IPO timing, as demonstrated by Guo et al. (2015), Hsu (2013), and Chang (2004).

The Cox model consists of two main components. The first part depends on time and captures how the likelihood of an IPO changes over time. The second part is exponential and focuses on the influence of the covariates (Lee Johnson & Shih, 2012), such as funding characteristics or market conditions, on the IPO timing. Unlike parametric survival models that assume a specific statistical distribution for the timing of events, the Cox model is semi-parametric. This means it does not require assumptions about the exact distribution of IPO timings, making it more flexible and applicable in real world data analysis (Chang, 2004).

Instead of concentrating on the exact timing of IPOs, the Cox model looks at the relative order of these events, allowing for a robust analysis of the factors driving differences in IPO timing. This approach provides insights into the impact of various factors on the incubation period, aligning with the first objective of this study to understand the dynamics influencing the time to IPO for startups.

Before applying the Cox proportional hazard model, it is essential to check the proportional hazard assumption for all non-time-varying covariates. Covariates are the variables included in the model to analyze their influence on the time to IPO. The proportional hazard assumption requires that the effect of each covariate on the hazard rate remains constant over time. In other words, the hazard ratio for each covariate should not change throughout the observation period.

If this assumption is not met, it indicates that certain covariates have time-varying effects, which can introduce bias or inaccuracies into the model's results. Ensuring that the assumption holds is critical for maintaining the validity of the analysis.

In this context, hazard rates represent the likelihood that a firm will go public at any given time. These rates are modeled as log-linear functions of the covariates. The hazard function $h(t;\ Z, X(t))$ incorporates both time-invariant covariates Z and time-varying covariates $X(t)$ to express the probability of an IPO occurring. The following model will be used to capture the relationship between these factors and the time to IPO:

$$h(t; Z, X(t)) = h_0(t)\ exp(\beta_1 Z_1 + \cdots + \beta_k Z_k + \gamma_1 X_1(t) + \cdots + \gamma_m X_m(t))$$

With:

- $h(t; Z, X(t))$: hazard rate at time t, representing the instantaneous likelihood of IPO
- $h0(t)$: baseline hazard, representing the hazard rate when all covariates are zero
- Z: vector of time-invariant covariates (e.g., total number of investment rounds)
- $X(t)$: vector of time-varying covariates (e.g., market environment metrics)
- β_k: regression coefficients to be estimated for time-invariant covariates Z_k
- γ_m: regression coefficients to be estimated for time-varying covariates $X_m(t)$

As the models were performed using STATA, the Breslow method was used.

4. Empirical Results and Discussion

Table 1 presents the distribution of the time to IPO and key funding intensity variables for the entire sample over different periods of time. Periods with high numbers of IPOs (1999-2001 and 2020-2023) were separated. This first analysis allows to have a broad look at overall trends

in the data, distinguishing the impact of the funding type (CVC vs. IVC) for each variable in the table.

Table 1: Distribution of time to IPO and key funding intensity variables

The distribution of the number of IPOs, time to IPO, funding per round and the frequency of rounds over time for the sample of 2727 US startups that went public between 1995 and 2023. All data were retrieved from Thomson Reuters database and checked with J.Ritter's website. The breakdown CVC vs. IVC was done according to the type of fund investor whether as a "Corporate or PE/Venture Fund" (CVC) or "Independent Private Partnership" (IVC).

	1995-1998	1999-2001	2002-2019	2020-2023	1995-2023
IPO					
Total	605	568	1240	314	2727
IVC	526	451	1070	242	2289
CVC	79	117	170	72	438
Time to IPO					
Mean	4.560	3.543	7.064	7.111	5.780
Mean IVC	4.497	3.580	7.081	7.233	5.814
Mean CVC	4.985	3.400	6.953	6.697	5.607
Funding per Round					
Mean	15.501	16.235	16.803	17.426	16.468
Mean IVC	15.498	16.236	16.798	17.397	16.452
Mean CVC	15.528	16.233	16.832	17.525	16.550
Frequency Rounds					
Mean	1.071	1.224	0.905	1.013	1.020
Mean IVC	1.090	1.195	0.893	1.012	1.009
Mean CVC	0.958	1.330	0.980	1.014	1.075

The total number of IPOs peaked during the dot-com bubble, with 568 IPOs between 1999 and 2001. After this, between 2002 to 2019, the market calmed down registering, in the sample used for this study, only 1240 IPOs during 17 years. Due to low-interest rates and the peak in demand for digital products when the COVID-19 pandemic started, a new wave of IPOs can be observed beginning in 2020. Most IPOs (84% of the total) are backed by IVCs. CVC accounts for a smaller portion but remains active, especially during the dot-com bubble (117 IPOs; 20%) and the recent surge (72 IPOs; 23%).

The time between the first VC-funding and the IPO (defined as time to IPO) increases over the years. During the dot-com bubble, it took companies an average of 3.543 years to go public. By

2020-2023, this rises to over 7 years. CVC-backed startups took in general less time to go public compared to IVC-backed companies. For example, during the dot-com bubble, CVC-backed companies took an average of 3.400 years, while IVC-backed companies took 3.580 years. In the recent period, the gap narrowed a bit, with CVC-backed companies averaging 6.697 years compared to 7.233 years for IVC-backed companies.

The funding received by startups during one investment round also increased over time. This variable is here on a log-scale as used in the further analysis to bring the distribution more to a normal one. CVC-backed firms consistently received slightly more funding per round than IVC-backed companies.

The frequency of funding rounds (calculated as the average number of rounds per year) peaked during the dot-com bubble at 1.224 rounds per year. It then dropped to 0.905 rounds per year in 2002-2019 before increasing slightly to 1.013 rounds per year in 2020-2023. IVC-backed companies generally had less frequent funding rounds than CVC-backed companies, except shortly before the dot-com bubble.

Overall, the data shows clear differences between CVC- and IVC-backed companies. CVC-backed companies tend to go public faster, especially during periods where the market is booming, and receive slightly more funding per round. They also experience in general more frequent funding rounds. On the other hand, IVC-backed companies dominate the overall number of IPOs. These trends show how different types of investors shape the timing and funding strategies for startups as they prepare to go public.

Table 2: Descriptive Statistics

Descriptive Statistics for all variables used later in the Cox proportional-hazard regression models to estimate the time to IPO based on funding intensity and funding type. Sample data come from Thomson Reuters database and regroup 9434 observations in total for 2727 startups that went public between 1995 and 2023. The dataset consists of all VC lead investments that a company had received from the founding date until the date of the IPO. Variables with (t) indicates that these are time varying covariates.

	N	Mean	STD	Min	Max
Number of Investors	9434	10.627	5.895	1	34
Number of Rounds	9434	7.677	4.468	1	45
Frequency of Rounds	9198	1.060	0.920	0.034	26.089
Total Funding Received	9434	2.30e+08	6.56e+08	500000	1.14e+10
CVC dummy (one investment)	9434	0.569	0.495	0	1
CVC dummy (lead investor)	9434	0.194	0.395	0	1
CVC dummy (t)	9434	0.096	0.294	0	1
Total Equity in one Round (t)	9429	35.062	128.985	0.5	5381.442
IPO Market Index (t)	9153	22.097	24.572	-28.8	163.2
Number of IPOs (t)	9153	21.677	18.382	1	90
Investor Capital under Management (t)	7936	5.35e+09	1.25e+10	100000	2.07e+11
Fund Size (t)	5761	5.57e+08	2.63e+09	380000	9.86e+10

As shown in Table 2, the descriptive statistics reveal high variability in funding activity and market conditions throughout the dataset. Therefore, as described in section 3.2., the log-transformation was applied to all variables that showed a highly skewed distribution.

4.1. Results on time to IPO analysis

Table 3: Funding intensity and type and the time to IPO

The Cox proportional-hazard regression models estimate the time to IPO based on funding intensity (baseline model, Model 1) and funding type (Model 2, 3 and 4) controlling for global market environment. The dependent variable across all models is the time to IPO in years. The CVC dummy is differently defined in Model 2, 3 and 4.

Dependent variable:	Time to IPO (in years)			
	Model 1	Model 2	Model 3	Model 4
Number of Investors	0.00642 (1.08)	0.00600 (0.70)	-0.00273 (-0.28)	0.00292 (0.33)
Number of Rounds	-0.0318*** (-3.73)	-0.0369** (-2.99)	-0.0344** (-2.78)	-0.0364** (-2.96)
Frequency of Rounds	0.104*** (11.53)	0.0991*** (7.85)	0.0981*** (7.71)	0.0986*** (7.79)
Total Funding Received	-0.730*** (-22.43)	-0.680*** (-15.61)	-0.690*** (-15.57)	-0.682*** (-15.60)
CVC dummy (one investment)	-	-	0.176* (2.04)	-
CVC dummy (lead investor)	-	-	-	0.221* (2.08)
CVC dummy (t)	-	0.0000262* (2.54)	-	-
Total Equity in one Round (t)	0.0000306*** (18.31)	0.0000295*** (12.08)	0.0000301*** (12.19)	0.0000299*** (12.21)
IPO Market Index (t)	0.000000127* (2.09)	0.000000205* (2.45)	0.000000213* (2.53)	0.000000218** (2.61)
Number of IPOs (t)	- 0.000000309** (-2.98)	- 0.000000431** (-3.10)	- 0.000000426** (-3.06)	- 0.000000433** (-3.11)
Investor Capital under Management (t)	-	-0.000000131 (-0.10)	-8.32e-08 (-0.06)	-6.15e-08 (-0.04)
Fund Size (t)	-	0.00000173 (0.86)	0.00000118 (0.58)	0.00000104 (0.52)
Chi2 (d.f.)	1034.927 (7)***	560.979 (10)***	559.385 (10)***	559.353 (10)***
-2LogL	-20113.508	-9730.440	-9732.034	-9732.066
N	8914	5229	5229	5229

Standard errors in parentheses
∗ p<0.05, ∗∗ p<0.01, ∗∗∗ p<0.001

Table 3 shows the results of the hazard model giving insights on how funding intensity and funding type (CVC vs. IVC) impact the time to IPO for startups. It is composed by two nested cox proportional hazard models and two variations of the second model, allowing deeper insights on the exact impact of the funding type. All models are run on the same dataset.

The first model serves as the baseline for examining the impact of funding intensity on the time to IPO. It incorporates besides four variables representing the funding intensity the three constant control variables defined in section 3.2. The negative hazard ratio (HR) of 0.969 indicates that more rounds of funding are significantly associated with slower time to IPO (p-value of 0.000) as the total funding received does (hazard ratio of 0.482). However, the frequency of funding rounds significantly increases the likelihood of reaching IPO sooner (HR = 1.109, $p < 0.001$). The control variables for the market conditions also both affects significantly IPO timing. The IPO market index shows that a better IPO market environment slightly accelerates the time to IPO, while the number of IPOs has a minimal negative impact on the time to IPO. The only variable showing no significant impact here is the total number of investor firms with a p-value of 0.279. Thus, one can conclude that high frequency of funding and lower total funding per round are associated with faster IPOs. But for instance, funding source details are still missing.

Model 2 adds the dimension of funding type, showing a marginal benefit from CVC involvement over time. This model adds the CVC dummy as a time varying covariate as the dataset was set up to capture changes throughout the startup's funding lifecycle. Additional time varying covariates were added to take the experience (capital under management) and fund size of the investors into account. CVC involvement shows a small but significant positive impact on faster IPOs (HR = 1.000026, $p = 0.011$), while the other funding intensity measures remain consistent with Model 1. Overall, in this first model incorporating the dimension of funding type, CVC involvement shows only a marginal benefit over time. Furthermore, neither capital under management nor fund size was shown as statistically significant, suggesting that the experience or size of the venture capitalists does not significantly affect the time to IPO in this model.

To explore in more depth the impact of CVC investments two further models (Model 3 and 4) where established changing the definition of the CVC dummy to a time invariant covariate but maintaining all over covariates equal. Model 3 specifies the CVC covariate as whether at least

one CVC investment has occurred in the funding period, regardless of whether it was done by the lead investor, or any other investor. The hazard ratio of 1.193 is significant ($p = 0.041$), suggesting that even one CVC investment in the funding period accelerates the time to IPO. This result shows a stronger impact than in Model 2. Funding intensity measures and market conditions continue to influence IPO timing, reinforcing the findings from the baseline model.

As a last step, the CVC covariate was defined more strictly, focusing only on investments where CVCs took the role of the lead investor in the funding journey of a startup. CVC as a lead investor has an even stronger and statistically significant positive impact suggesting that when a CVC has led at least one investment round, the time to IPO for a startup is shorter ($HR = 1.247$, $p = 0.038$). Other variables, such as frequency of funding rounds, the number of rounds, and funding size, continue to show consistent results.

As additional predictors were added during the analysis, it is important to evaluate the overall fit of each models reflecting their individual quality. In the case of nested models, the -2 Log-Likelihood can be used in addition to the Chi-squared statistic to evaluate the model fit. Model 2 has the best fit (lowest -2 Log-Likelihood and exceed of the Chi-squared critical value over the -2 Log-Likelihood delta). Model 3 and Model 4 are nearly equivalent to Model 2. Thus, one can conclude, that the variables included to analyze the funding type, improved significantly the fit of the overall model.

Comparing the results across models, one can say that the funding intensity covariates show very consistent values across all models demonstrating robustness. Higher frequency of rounds accelerates IPOs, while larger total funding per round slows it down. The total number of investors has minimal or no significant impact. Considering the funding type (CVC vs. IVC), the time-varying CVC dummy (Model 2) has a marginal effect, while CVC as lead investor (Model 4) has the strongest, statistically significant impact on faster IPOs. This suggests that CVC investments, especially when they are done as lead investors, play a more critical role in expediting the IPO process.
Finally, market conditions (e.g., IPO market index) are significant across all models, emphasizing the importance of the broader economic environment on the timing of IPOs as analyzed by several authors.

4.2. Robustness Checks

To ensure the reliability of the previous findings, two robustness checks were conducted. The first involved modifying the variables representing funding intensity. Similar to the adjustments made with the CVC dummy variable in Models 2, 3, and 4, a new variable (time invariant), "Average Funding per Round," was computed as the logarithm of the total funding received divided by the total number of investments rounds. The baseline model was then rerun with this new variable and the other five covariates, keeping all other conditions unchanged. Although the explanatory power of this new model decreased slightly compared to the initial model, the results remained significant. The findings confirm that higher average funding per round tends to delay IPO timing, whereas higher funding frequency accelerates it. This underscores the significance of the "small but frequent" funding pattern already identified in section 4.1., which reflects a balance between exploration and exploitation.

The second robustness test examined the consistency of the results across different time periods. Both the baseline model (Model 1) and Model 4 (where the CVC dummy had the strongest influence) were tested using two different time subsets: 1995–2001 and 2002–2023. These subsets correspond to two major IPO waves, around the dot-com bubble in the years 1999-2000. Moreover they align with the two waves of venture capital funding identified by Dushnitsky (2012) as mentioned when describing the decision made about the timeframe of the analyzed sample (section 3.1.).

The results showed consistency in the core variables and time-varying variables, further emphasizing the role of the latter in accounting for temporal market effects. Variables such as "Number of Investment Rounds," "Frequency of Rounds," and "LogTotalFunding" show consistent patterns across both time periods, confirming their robustness as predictors of IPO timing. The significance of the CVC dummy varied slightly. Its influence became stronger in the post-2002 period. This aligns with a maturing venture capital ecosystem where strategic CVC roles are better established. Furthermore, these findings are consistent with the observations of Dushnitsky (2012) of a changing CVC investment landscape, characterized by greater corporate commitment in the most recent wave of CVC investments.

4.3. Discussion and link to ambidexterity

The Cox proportional hazard models show that startups backed by CVC experience shorter times to IPO, particularly when CVC investors lead funding rounds. This highlights the advantages CVC investors bring, such as better access to resources, market knowledge, and operational support (Dushnitsky, 2012) compared to IVC. Startups with CVC backing manage to balance both exploring new opportunities and making the most of existing ones, as discussed in section 2.3. They benefit from the strategic guidance of their investors, which helps them innovate while growing their business (Hill & Birkinshaw, 2014). This ambidexterity allows to position themselves favorably for public markets, where investors will also value strong long-term performance besides short-term results (Barton & Wiseman, 2014; Sampson & Shi, 2023). The role of CVC as a lead investor appears particularly impactful in accelerating IPO readiness, likely because of the closer alignment in strategy and the sharing of resources that come with a lead role.

These results challenge the notion that extended IPO timelines are always necessary for ambidextrous growth (Guo et al., 2015). Instead, the findings suggest that CVC investors enable startups to achieve accelerated scaling while managing inherent tensions between exploration and exploitation. This aligns with the view that ambidexterity is not only a long-term strategic goal but also a driver of short-term milestones (Birkinshaw & Gibson, 2004) such as IPO readiness.

This study builds on existing research about how Corporate Venture Capital supports startups in balancing two critical goals: exploration and exploitation. Exploration focuses on long-term innovation and strategic growth, while exploitation emphasizes short-term efficiency and achieving immediate objectives (Sinha, 2015). Previous studies have shown that CVC-backed startups tend to perform better after their IPO, suggesting that CVC helps companies develop the innovative capabilities needed for long term success (Benkraiem et al., 2023; Rossi et al., 2019).

The findings of this research, reveal that CVC-backed startups also reach IPO more quickly, which highlights their ability to achieve short-term milestones effectively. This faster time to IPO could reflect on a higher level the exploitation side of the balance, as companies are leveraging the resources, expertise, and networks of CVC investors to scale rapidly and meet market readiness.

The combination of these outcomes (shorter time to IPO and better long-term performance) strongly suggests that CVC-backed startups are very well positioned to manage both: short-term and long-term goals. They know how to exploit immediate opportunities to go public while simultaneously building the foundation for sustainable growth and innovation (post-IPO performance). This highlights the strategic value of CVC in fostering startups that can achieve ambidexterity.

Frequent and smaller funding rounds also emerge as critical factors for accelerating IPOs (Model 1, section 4.1). This funding strategy aligns with the principles of sequential investment, where incremental funding allows for ongoing evaluation and risk mitigation, thus reducing uncertainty (Bergemann & Hege, 1998). Although this specific approach is not exclusively tied to CVC investors, the strategic involvement of CVC in startups often supports iterative resource allocation giving investors information about the funded companies (Dushnitsky & Lenox, 2006), which is consistent with such funding patterns. CVC-backed startups, supported by these sequential investments, could therefore achieve shorter IPO timelines not only through financial backing but mainly through the strategic expertise and information flow reducing uncertainties from both sides during the funding journey.

As suggested by CVC investments associated with ambidexterity, rather than IVC investments focusing on exploitation, the pattern of frequent and small funding rounds found significant in the Cox proportional hazard models could also reflect a balance between exploitation and exploration. The small funding amounts suggest the "capacity [of startups] to capitalize on an existing set of resources", defined as exploitation by Hill and Birkinshaw (2014). Larger funding per round would have likely allowed startups to engage in more exploration therefore reducing pressure for immediate market entry. Meanwhile, the short intervals and high intensity, highlights a key aspect of exploration enabling to "develop[p] new combinations of resources to meet future market need" (Hill & Birkinshaw, 2014).
Furthermore, if we look at the IPO event as an uncertain event (this was also the purpose of using a Cox proportional hazard model here), we could have a look at how entrepreneurs deal with such uncertainties in regard to exploration and exploitation. Ziad (2022) highlights that entrepreneurs tend to react differently depending on how their confidence level. At first, in the journey towards the unpredictable, they would tend to favor exploitative behavior, seeing all accomplishments as a step in the right direction from which they should benefit. Later on, as they face several setbacks and following wins, entrepreneurs tend to have a more explorative

behavior. Being surer to go in the right direction, having learned from the past, they explore and gain in quality (Ziad, 2022). This pattern is also reflected in the identified funding scheme bringing startups faster to the IPO: small funding amounts maintain limits to exploit the given resource rather high frequency signals while time passes more confidence, thus exploration.

5. Conclusion

The primary objective of this research was to assess rather and how financing interacts with strategy in the context of startups. To do so, we decided to take on the one hand the IPO event as a proxy for the strategic orientation of a firm and to focus on the over hand on funding type and funding intensity as two key aspects of the financing of startups. Time to IPO as strategic indicator represents the balance between exploration (e.g. development of product) and exploitation (e.g. scale). Thus, exploring how funding type and intensity impact the time to IPO will tell us more about the strategy startups follow.

Results indicate that frequent, smaller funding rounds appear critical for accelerating IPOs (consistent through all 4 Models). Furthermore, CVC-backed companies tend to achieve IPOs faster, especially when at least one lead investment was done by a CVC. Active involvement of CVC as lead investors (Model 4) is more impactful than general involvement or involvement over time (Models 2 and 3). In all cases, they contribute to shorter time to reach IPO. Thus, the IPO event is not only about exploitation as intuition could state. If this would be the case, classic IVC's focusing on securing fast returns would be the investor bringing startups the fastest way to IPO. Far more than that, the funding pattern "less funding but frequent funding rounds" and the known strategic value brought by CVC investors to their clients emphasize, that startups adopting ambidextrous behavior increase likelihood to IPO and therefore accelerate their development.

By making this link between funding and strategic behavior, this study enlarges research on ambidexterity. The finding that CVC-backed companies tend to go faster to IPO, also build up on existing studies already demonstrating that CVC-backed startups tend to achieve better valuation at the time of IPO. A major practical advice for startups would be to prioritize securing CVC as lead investors and maintaining consistent, frequent funding rounds rather than focusing on accumulating large funding sums if they aim for faster IPOs. Investors could benefit

from this research by realizing that high funding frequency increase the speed to IPO for their startups.

However, this study faces several limitations that offer avenues for future research. We examined a wide range of papers on ambidexterity and cross their findings with ours, taking the IPO event as a proxy for strategic orientation of firms. However, we could not access to specific, not only funding related variables for the time before IPO to make our link between our findings and ambidexterity even more robust. Furthermore, since the strategic topic is always more explorative than number-driven, it could have been a possibility to conduct interviews to better catch the intensions of entrepreneurs when preparing for the IPO. Finally, prior studies suggest that the impact of the industry and even the match between investors and startups in the same industry, could impact their funding journey. To maintain this research in an understandable scope, not too wide, it was intentionally decided to not include a differentiation by industry. Further research could e.g. pick only one specific industry and go deeper with some additional metrics about the pre-funding journey. A possibility could be to include e.g. R&D metrics such as patent count or company related financial metrics. Moreover, to make the findings on CVC more robust, pre- and post-performance of the backed startups could be analyzed in one single study.

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